A RAND NOTE

Defense and the Soviet Economy:
Military Muscle and Economic Weakness

Charles Wolf, Jr., Steven W. Popper, editors
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Defense and the Soviet Economy: Military Muscle and Economic Weakness

Charles Wolf, Jr., Steven W. Popper, editors

Prepared for the
Under Secretary of Defense for Policy

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- iii -

PREFACE

This is the second volume resulting from the collaboration between RAND and the Hoover Institution, directed toward improving our understanding and analysis of the special role and significance of the defense sector in the Soviet economy. This collaboration has taken the form of biennial symposia organized by the two institutions with authors and participants who include some of the world's most knowledgeable experts in the field. The first symposium on this subject, held at Hoover in Stanford, California, in March 1988, resulted in a book edited by Henry S. Rowen and Charles Wolf, Jr., The Impoverished Superpower: Perestroika and the Soviet Military Burden, published in 1990 (Institute for Contemporary Studies Press, San Francisco). The present Note contains the papers presented at the second symposium, held in March 1990 at RAND in Santa Monica, California.

This work is part of RAND's International Economic Policy Program. The research was sponsored by the Under Secretary of Defense for Policy under the auspices of RAND's National Defense Research Institute, a federally funded research and development center supported by the Office of the Secretary of Defense and the Joint Staff. It should be of interest to members of the U.S. defense and foreign policy communities concerned with evolving Soviet economic policy and military policy, and Soviet economic reform. The Hoover Institution's participation in the collaborative effort received support from the Pew Charitable Trusts, the Olin Foundation, the Department of Defense, and The Ford Foundation.
CONTENTS

PREFACE ........................................................................................................ iii
FIGURES ......................................................................................................... vii
TABLES .......................................................................................................... ix

Section
1. INTRODUCTION: THE ROLE OF DEFENSE IN THE CURRENT SOVIET
   ECONOMIC PREDICAMENT
   Charles Wolf, Jr., and Steven W. Popper .............................................. 1

PART I: SOVIET NATIONAL ACCOUNTS AND ECONOMIC PERFORMANCE:
   ALTERNATIVE ESTIMATION METHODS
2. THE GROWTH OF SOVIET GNP AND MILITARY EXPENDITURES IN
   1970-1989: AN ALTERNATIVE ASSESSMENT
   Dmitri Steinberg ................................................................. 12

PART II: EFFECTS OF PERESTROIKA ON THE SOVIET DEFENSE SECTOR
3. WHY PERESTROIKA WILL REDUCE THE SOVIET MENACE
   Anders Aslund ......................................................... 38
4. THE PROSPECTS FOR TECHNOLOGICAL INNOVATION IN SOVIET
   MILITARY R&D IN THE 1990s
   Stephen M. Meyer .......................................................... 65
5. THE EFFECTS OF PERESTROIKA ON THE DEFENSE SECTOR AND
   RESOURCE ALLOCATION IN THE USSR
   James Noren ................................................................. 91
6. SOVIET STATISTICS UNDER GORBACHEV: A WESTERN PERSPECTIVE
   Vladimir G. Treml ............................................................ 118

PART III: SOVIET ALLOCATIVE CHOICES AND OPERATION OF THE
   PRIORITY SYSTEM
7. THE CHANGING PRIORITY OF THE SOVIET DEFENSE
   SECTOR: 1985-1990
   Christopher Davis .............................................................. 139
8. PRIORITY AND TECHNOLOGY CHOICE UNDER PERESTROIKA
   Steven W. Popper .......................................................... 169
9. GORBACHEV'S ALLOCATIVE CHOICES
   Charles Wolf, Jr. ............................................................ 191
PART IV: EFFECTS OF FOREIGN TRADE AND TECHNOLOGY TRANSFER ON THE SOVIET DEFENSE SECTOR

10. SECURITY DIMENSIONS OF SOVIET FOREIGN TRADE
   Abraham S. Becker ...................................................... 217

PART V: POSSIBLE EFFECTS OF CURRENCY REFORM

11. MONETARY REFORM
   Gregory Grossman ...................................................... 226

12. SOVIET OPTIONS FOR MONETARY REFORM
   Judy Shelton ............................................................. 247

PART VI: CONVERSION OF THE DEFENSE INDUSTRY

13. THE CONTRADICTIONS OF SOVIET DEFENSE INDUSTRY CIVILIZATION
   Julian Cooper .......................................................... 264

Appendix

13.C THE PLANNED SCALE OF SOVIET DEFENSE INDUSTRY CONVERSION ...................................................... 284
13.D PLANNED DEFENSE INDUSTRY CIVILIAN OUTPUT DURING 1991-95 .......................................................... 289
13.E EVIDENCE ON CUTBACKS IN THE PRODUCTION OF MILITARY EQUIPMENT .................................................. 290

14. THE CONVERSION OF SOVIET DEFENSE INDUSTRY
   Arthur J. Alexander .................................................. 291
FIGURES

7.1—The National Security Production Process in the USSR ......................... 150
8.1—Return on Investment Under Several Economic Regimes .................... 184
TABLES

2.1 IDS (Steinberg) and CIA Estimates of Average Annual Rate of Soviet Economic Growth in 1982 Prices .................................................. 30

2.2 IDS and CIA Estimates of Soviet GNP Growth by Sector of Origin .................................................. 31

2.3 IDS and CIA Estimates of Average Annual Growth of Per-Capita Consumption in the USSR .................................................. 32

3.1 Increases in Wages, Retail Sales and Labor Productivity .................................................. 50

3.2 Incremental Changes in Population's Incomes, Savings Deposits and Retail Sales .................................................. 52

3.3 Growth Of National Income 1981-89 .................................................. 53

5.1 USSR: Annual Percentage Growth of GNP by Sector of Origin .................................................. 97

5.2 Announced Spending on Defense in USSR .................................................. 109

9.1 Estimates of Soviet GNP and Military Spending, 1987 .................................................. 196


9.5 Sectoral Reallocation with Deep Military and Empire Reductions: 1987, 1995 .................................................. 211

9.6 Austerity, Reallocation, and Reform: Policy VII .................................................. 212


11.1 Selected Domestic Financial Stock (Balance Sheet) Magnitudes, 1970-1989 .................................................. 233

11.2 Selected Data on Financial Flows (or year's changes in stocks), 1985-90 .................................................. 236

11.3 Money Holdings of Enterprises and Households .................................................. 238

11.4 Selected Series, 1971-1989 .................................................. 239

13A.1 1988 Capital Stocks .................................................. 278

13B.1 The Share of Total Soviet Output of Civilian Products from Enterprises of the Defense Industry, 1988 .................................................. 281

13C.1 Proportions of Gross Output of Defense Complex .................................................. 284

13C.2 Planned Change of Output .................................................. 284

13C.3 Plans for the Partial Conversion of the Defense Complex .................................................. 286

13C.4 Output of the Defense Complex .................................................. 287
Second Biennial RAND-Hoover Symposium
THE DEFENSE SECTOR IN THE SOVIET ECONOMY
March 29 – 30, 1990
Santa Monica CA

ATTENDEES

Arthur Alexander (RAND)
Anders Aslund (Ostekonomiska Institutet)
Abraham Becker (RAND)
Abraham Bergson (Harvard)
Igor Birman (FSS)
Julian Cooper (Birmingham)
Keith Crane (RAND)
Devon Gaffney Cross (Smith Richardson)
Christopher Davis (Birmingham/Hoover)
David Epstein (Department of Defense)
Gregory Grossman (Berkeley)
Tom Henriksen (Hoover)
Vladimir Kontorovich (Haverford)
Jim Leitzel (Pew/Duke)
Andrew Marshall (Department of Defense)
Ronald McKinnon (Stanford)
Stephen Meyer (MIT)
James Noren (CIA)
John Pitzer (CIA)

Larissa Piyasheva (Academy of Sciences)
Steven Popper (RAND)
Michael Rich (RAND)
Henry Rowen (Department of Defense)
Larry Seaquist (Department of Defense)

Rapporteurs:
Patria Brukoff (RAND)
Jeanne Taylor (Hoover)
1. INTRODUCTION: THE ROLE OF DEFENSE IN THE CURRENT
SOVIET ECONOMIC PREDICAMENT

Charles Wolf, Jr. and Steven W. Popper

THE CONTINUED SIGNIFICANCE OF THE SOVIET UNION'S
MILITARY ECONOMY

The extraordinary events since the fall of the Berlin Wall in November 1989 and the
dissolution of the Soviet Union at the end of 1990 make analysis of the defense sector's role
in the former Soviet economy of greater historical than of current relevance. Nevertheless,
there remain several reasons why it is still useful to understand the size and composition of
the military economy in the former Soviet Union (FSU).

The first reason is that accurate assessment of the FSU's military forces, spending,
and technology continues to be important because the Russian military establishment has
inherited most of these elements. Russia remains the strongest military force in the
Eurasian land mass and is still a significant factor in the international balance of power.
Notwithstanding the sharp reductions underway and impending in the forces, they will still
leave Russia as the predominant military power in Europe. Also, while the FSU's military
industry is making limited progress in conversion to civilian production, much of the defense
industrial base remains intact, continuing as a priority claimant on budgetary resources in
Russia and the other republics.

A second major reason for understanding the role of the military sector in the FSU's
economy relates to its traditional leading role in that economy. This prominence stands as
one important factor, although certainly not the only one, contributing to the laggard
performance of the republics' economies since dissolution of the FSU. If these economies'
downhill slide is to be reversed, one important ingredient will be a move toward a smaller
defense sector whose resource allocations are acquired through a more transparent and
accountable process than in the past. Moreover, because of the size and influence of the
defense industry, its willingness and ability to transform its institutions of economic

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They would also like to acknowledge the contributions of Patricia Brukoff and Jeannie Taylor,
who acted as conference rapporteurs, and whose draft of the proceedings was used in writing this
section.
management and organization will significantly affect the prospects for more general transformation of the republics' economies.

The third reason for continued scrutiny by Western analysts is that the military's access to scarce resources is a significant reflection of its political role, as well as a contributor to it. The status of the defense sector is therefore an indicator of the relative domestic political strength of those heretofore powerful interests associated with it.

We are principally concerned in this volume with the first and second reasons, and only peripherally with the third. Yet, clearly, the issues of military power, economics, and politics are closely intertwined.

PURPOSE AND CONTENT

This Note is the outgrowth of the second symposium on the Defense Sector in the Soviet Economy organized by RAND and the Hoover Institution in March 1990 in Santa Monica, California. The first symposium on this subject was held at the Hoover Institution at Stanford, California, in March 1988, resulting in a book titled The Impoverished Superpower: Perestroika and the Soviet Military Burden, edited by Henry S. Rowen and Charles Wolf, Jr., and published in 1990 (Institute for Contemporary Studies Press, San Francisco). As its predecessor, the second symposium brought together some of the top-ranking experts on Soviet defense and economic issues from both the government and research communities, with participation by one prominent Soviet economist, Larissa Piyasheva.

The papers produced for the March 1990 symposium constitute the sections of this Note. Although the information and data on which the papers are based have not been updated—notwithstanding the extraordinary pace and character of the changes that have occurred since they were written—the views and analysis are of interest in their own right, both for reference and historical purposes and to provide a touchstone against which the rapidity and pace of change can be viewed.

Following the structure of the symposium, the Note is divided into six parts. The first part proposes methods for estimating the size of the Soviet economy and its economic performance as an alternative to the methods used by the Central Intelligence Agency (CIA) on which so much of the previous research on the Soviet economy has relied. In Section 2, The Growth of Soviet GNP and Military Expenditures in 1970-1989, Dmitri Steinberg presents an alternative statistical basis for evaluating the size of the Soviet gross national
product (GNP), military expenditures, and economic growth for 1970 and 1989. He criticizes the "adjusted factor cost" methodology used by CIA on the grounds that Soviet statistics do not provide sufficient data to make reliable calculations with this method, and then proposes and applies a different factor-cost methodology in its place.

Part II deals with the effects of perestroika on the defense sector. Anders Aslund in Section 3, Why Perestroika Will Reduce the Soviet Menace, argues that Gorbachev's perestroika and his own personal inclinations portend reductions in military resource allocations and hence in the Soviet military threat to the West. Moreover, even if Gorbachev fails, according to Aslund, fundamental constraints imposed by the lagging performance of the Soviet economy will reduce the Soviet military threat.

Stephen Meyer provides reinforcement of Aslund's position. In Section 4, The Prospects for Technological Innovation in Soviet Military R&D in the 1990s, Meyer assesses the balance between forces that might lead to increased or decreased emphasis on advanced military technology in the Soviet Union. He concludes that the forces making for contraction (including pressures for defense conversion, more accurate cost accounting, self-financing, etc.) will predominate.

James Noren's discussion of The Effects of Perestroika on the Defense Sector and Resource Allocation in the USSR in Section 5 suggests that increased pressures on resources in the Soviet Union will result in significant reductions in total military allocations with increased emphasis on technological sophistication of new systems. These changes, he argues, will result from both macroeconomic resource constraints as well as from changes in Soviet military doctrine.

Under all of the preceding papers, as well as both of those that follow, lurk the basic questions about the quality of Soviet statistical data that Western analysts have been working with all these many years. In Section 6, Soviet Statistics Under Gorbachev, Vladimir Treml suggests that Goskomstat has not had a monopoly on the production of statistics and, in fact, five ministries have shared responsibility for statistics in different sectors. He suggests that there are major gaps in the quality and coverage of the data, and indeed that the whole system has been generating less reliable information than had previously been assumed. Moreover, he argues that the flow of information to Soviet decisionmakers has been seriously distorted, causing them to frequently make erroneous policy decisions based on data they mistakenly assumed to be valid.
Part III focuses on Soviet allocative choices as between the military and other sectors. Christopher Davis' Section 7, *The Changing Priority Status of the Soviet Defense Sector: 1985–1995*, portrays a system in which priorities for the military remained high until about 1989. Thereafter, he suggests that a significant shift in macroeconomic priorities has occurred, with more emphasis given to consumption. This reflects Gorbachev's policy of building security by shifting from military production to threat reduction. Davis anticipates that changes in national priorities, as well as continuing resource constraints, will sustain these tendencies toward reductions in the future of the military's protected and preferred status in the past.

Steven Popper's Section 8, *Priority and Technology Choice Under Perestroika*, explores the effort under perestroika to upgrade and modernize technology in Soviet industry. He contends that the absence of genuine systemic economic reform results in perverse incentives as well as inadequate information to enable Soviet ministries to make efficient decisions about the appropriate quality levels of new technology. In fact, by introducing a systemic bias away from least-cost solutions, perestroika's push for "the world's best technology" has impeded rather than helped modernization of Soviet industry.

Charles Wolf's Section 9 on Gorbachev's *Allocative Choices* examines the severely conflicting resource claims facing the Soviet leadership as among the military sector and ten other sectors of the Soviet economy. To illustrate these conflicting resource claims, he formulates several alternative combinations of allocations across these competing sectors, deriving implications with respect to arms control, prospective military budgets, and the future foreign debt of the Soviet Union.

Part IV considers the effects of foreign trade on the Soviet defense sector. Abraham Becker's Section 10, *Security Dimensions of Soviet Foreign Trade*, suggests that, in the aggregate, gains from trade have not substantially eased the economic burden of Soviet defense in the past, nor are they likely to do so in the future. Becker believes that commercial trade has become a problematic means for technology transfer, leading the Soviets to turn their attention toward alternative means of obtaining foreign technology through joint ventures and, perhaps, the organization of "special economic zones."

Part V deals with the monetary aspects of the contemporary Soviet economy. In Section 11, Gregory Grossman addresses *Monetary Reform*, arguing that it must be closely linked with the imposition of fiscal and credit restraints. Without this close linkage, the so-called "ruble overhang" problem will recur as a fundamental obstacle to possible attempts to achieve market-determined prices and wages. Judy Shelton considers, in Section 12, *Soviet
Options for Monetary Reform, viewing—as does Grossman—monetary reform as one of the principal ingredients of successful market-oriented reform of the economic system. The options she considers include an internal crackdown, a transfer to a new monetary unit, allowing the rouble to float, and moving to a gold- or dollar-backed currency.

The concluding Part VI on conversion of Soviet defense industry includes two sections. Section 13 by Julian Cooper analyzes The Contradictions of Soviet Defense Industry Civilization. Cooper criticizes the evident Soviet policy of enlarging the defense industry sector by assigning to it increased responsibilities for undertaking civilian production. This avoids, rather than accelerates, fundamental or permanent changes in production facilities, management, and incentives. Conversion has thus been a top-down, centrally planned process, with defense industry enterprises having little influence in shaping the process. This stands in stark contrast to the philosophy supposedly informing the process of perestroika. Resistance within the defense sector to conversion could lead, in Cooper's judgment, to a showdown between Gorbachev and the Soviet military industrial complex. Arthur Alexander's discussion in Section 14, The Conversion of Soviet Defense Industry, concurs in Cooper's description of conversion, but argues that there are some advantages attendant to it. These advantages include the defense industry's supply priority, its relatively well-trained labor force, and its more advanced technology. According to Alexander, this may redound in the short-run to the benefit of the civilian economy. However, in the long-run, he argues that systemic shortcomings will make the converted enterprises as inefficient as their counterparts in traditional civilian sectors. Both Cooper and Alexander agree additional investment will be required to implement conversion; the substantial results looked for by the national leadership will not be quickly forthcoming.

CONTROVERSIES ABOUT THE SOVIET ECONOMY AND THE MILITARY BURDEN

Analysis of the Soviet economy is marked and marred by a number of controversial issues on which Soviet economists differ from one another hardly less than do Western economists. Many of these issues and controversies are reflected in this Note as well as in the discussion that accompanied the papers when they were delivered at the RAND-Hoover symposium in March 1990. Several of the controversial issues are especially prominent.

One relates to the quality of Soviet statistics and what can be done to improve it. It is well-known and generally accepted that the statistical basis underlying the extensive literature on the Soviet economy, including the sections of this Note, is unreliable. It is
perhaps less well-known and a subject of controversy as to precisely how unreliable the statistical basis is.

One view is that production data are generally reliable, although ruble value data are less so. To remedy this discrepancy, it has been held over many years that suitably prudent methodology—namely, valuation at “adjusted-factor cost”—can be used to derive accurate estimates of the size of the Soviet economy relative to that of other economies, and of the economic burden represented by the Soviet military. Divergence from this view is based both on the contention that the underlying production data are apocryphal and that the proposed factor-cost methodology is unsatisfactory. Instead, critics contend that the statistical base for appraising the Soviet economy is extremely weak for a number of reasons: deterioration of product quality, hidden inflation, misclassification of production, inclusion of "valueless" output in production data, and simple fraudulent padding of data—the latter increasing over time as the reporting nodes in the system have increased in number. Moreover, even the adjusted-factor cost methodology does not allow for accurate assessment of real “opportunity costs,” because opportunity costs depend on a rational price system, which the Soviet economy does not have.

A second controversy, closely related to the preceding one, concerns the enormous range of estimates made by both Soviet and U.S. economists concerning the comparative size of the Soviet economy relative to that of the United States. These estimates differ by a multiple of more than three. For example, Soviet academicians V. A. Tikhonov and economist Boris Belkin have estimated the size of the Soviet economy as one-seventh, or 14 percent, that of the U.S. economy (about the size of the Indian economy). Soviet economists Vasili Selyumin and Grigori Khanin place the figure at between 20 and 25 percent. Anders Aslund and Igor Birman have placed the Soviet economy at about 30 percent of the U.S. GNP (about the size of Germany’s GNP). Richard Ericson’s estimate is about 33 to 40 percent, while the estimates of CIA and the deputy chairman of Goskomstat, Pogosov, have been about 50 to 53 percent (about the size of Japan’s GNP).

Clearly, determination of the size and cost to the economy of the Soviet military burden depends upon having a reliable estimate for the GNP. Estimates of the size of the Soviet military’s share of the Soviet GNP vary by a multiple of nearly two. The CIA estimate

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2Adjusted factor cost (AFC) adjusts all prices to make them generally equal to imputed average production costs. The AFC adjustment removes reported taxes and subsidies from the prices of good and services and adds to the resulting prices an allowance for the average return on capital.

is in the range between 15 and 17 percent; estimates by Igor Birman, Oleg Bogomolov, and David Epstein are about 25 percent; and estimates by Aslund and Khanin and Selyunin are about 30 percent.\textsuperscript{4} Thus, the degree to which reduction in military expenditure could by itself play a large role in averting economic catastrophe is not clear.

Of course, these estimates all relate to data from the recent past. In the future, it should be both possible, as well as desirable, to try to improve the underlying statistical basis for assessments of the Soviet economy. One way of doing so is by conducting sample surveys of households, enterprises, collective farms, cooperatives, and other economic activities. Another method is to use the market prices of Soviet goods in foreign markets as a cross-check on adjusted-factor costs or other valuation techniques.

Another controversial issue relates to the economic benefits that may ensue from the reduction in defense spending (the prospective "peace dividend"). In turn, this question relates to other issues: (1) the extent to which the serious plight of the Soviet economy is due to the large defense burden; and (2) the extent to which the crisis is attributable instead to the shortcomings of the system itself. Clearly, both elements are responsible; the issue is determining their relative influence.

Although as noted above there is a significant controversy as to the precise share represented by the military burden, there is no doubt that it is enormous. And this burden extends beyond simple resource allocations to the military. It includes as well the resulting deformations to the structure of Soviet industry, infrastructure and R&D, the military's preferred access to high-quality labor and material inputs, as well as the relationships among all these factors over time. However, one does not need the existence of a huge military burden to explain the Soviet Union's poor economic performance: The latter is also explained by the debilitating effects of a command, centrally planned system on incentives, innovation, competition, and productivity, as illustrated by the weakened condition of other command economies with lower military-spending shares of GNP.

To convey a rough idea of the magnitude of a potential "peace dividend" in the Soviet Union, suppose the shares of the Soviet military and empire costs were to be reduced from, say, 25 to 15 percent of GNP, with the saved resources reallocated equally between consumption and investment but with no other changes in the Soviet system. What effect would such a major reduction in the defense sector have on civilian consumption and aggregate economic growth? If one assumes, as suggested earlier, that the Soviet GNP is about one-third that of the United States (or about 1.7 trillion 1989 U.S. dollars), that Soviet

consumption is about 55 percent of GNP, and that the Soviet population (about 290 million) is growing at a rate of about 1 percent per year, the effect of this relatively large resource reallocation would be modest. Given the recent setbacks to the economy, Soviet consumption per capita is perhaps around $3,000, or about 25 percent of the U.S. level and about equal to that of Turkey or Mexico. Transferring, for example, 5 percent of Soviet GNP to consumption would represent a total increase in consumption of 9 percent. Assuming, however, that the defense spending cuts and ensuing resource reallocations were spread over a four-year period, the resulting annual increase over current levels of aggregate consumption for this transfer of defense resources would be about 2.27 percent and, allowing for population growth, about 1.27 percent in per capita consumption. The direct effect of this transfer of resources from defense to consumption would thus be an annual increase in per capita consumption of about $42 a year, accumulating to $168 over the four-year period.\footnote{These calculations are based on the following simple model:}

\[ S_c = \text{share of GNP reallocated from military to consumption uses (}= 5\%) \]
\[ S_i = \text{share of GNP reallocated from military to investment (}= 5\%) \]
\[ Y_c = \text{consumption share of GNP (}= 55\%) \]
\[ t = \text{number of years over which resource reallocations are equally spaced} \]
\[ t = 4 \text{ years} \]
\[ C_t = \text{annual rate of increase in consumption resulting from transfers from military over t-period} \]
\[ p = \text{annual rate of population} \]
\[ c_t = \text{annual rate of growth in per capita consumption over t-period} \]
\[ C_t = \frac{S_c}{Y_c} \cdot \frac{0.05 - 0.55}{4} = 0.0227 \]
\[ c_t = 0.0227 - 0.0160 = 0.0067 \]

Moreover, this would represent a one-time boost in consumption, which would thereafter remain at the same level.

Calculating the effect of reallocating the remaining half of the 40-percent slash in military spending to investment and R&D—again assuming that the Soviet system otherwise remains unchanged—is more problematic. Because of the lack of capital markets and the great difficulties in calculating economic results in a milieu where prices do not reflect true opportunity costs, the marginal efficiency of investment in some sectors may even be negative in real terms. Based upon past performance it is unlikely that a one-time increase in investment equal to 5 percent of GNP would add much more than 1 percent to the annual rate of Soviet real economic growth. Of course, if this growth were sustained, consumer welfare would grow further as well.
While these are only rough approximations, they give an idea of the results of reallocating resources from military to nonmilitary uses without accompanying changes in the Soviet system itself. Altogether, they would give a small boost to the economy but would hardly transform it.

On the other hand, what would be the effects of fundamental changes in Soviet economic institutions through genuine price reform, enterprise reform, change in the laws governing property ownership, monetary reform, and achieving currency convertibility, assuming only minor changes in the size of the defense sector? In particular, what would be the economic effects, apart from political and social strains, that such drastic reform would set in motion? Would the burst of effort and energy released by the new environment propel the economy forward at a high and sustained rate, or would the still-massive size of the defense sector continue to exercise a severe braking effect on productivity and real economic growth? It is likely that such systemic changes would transform the economy, but the maintenance of a huge military sector would surely slow the process. Even if the military burden were only on the order of 15 percent of GNP this would leave little surplus to the economy during the inevitably awkward period of transition. Further, it is difficult to imagine spending on defense being sustained at this level without retaining the traditional, unreformed institutions. This could well frustrate any over-arching reform design.

POLICY CONSIDERATIONS

This Note, as well as the important sources of controversy discussed above, have relevance to several issues that currently concern U.S. policy. As suggested above, the Soviet military has not ceased to be an important focus for U.S. security policy despite the palpable thaw in the Cold War. The topics discussed in the following papers will remain relevant for continuing the process of evaluation and policy reformulation.

First, the United States has an interest in Soviet movement toward a smaller and more defensively oriented military establishment. Several of the contributions to this volume suggest that the pressing need to redress the general Soviet economic crisis by means of fundamental reform and reallocation of resources, coupled with the unsustainability of previous patterns of expenditure, will provide internal pressure in the direction of military reductions. However, the precise nature of the resulting military establishment and the degree of reduction will depend on a series of economic and domestic political factors as well as on Soviet perceptions of external contingencies.

Second, the United States has an interest in the development of a more transparent and more accountable process for overseeing the allocation of resources to the Soviet military,
whether this accountability is attained through a more active role of the Defense and State Security Committee of the Supreme Soviet in the Union government; through a more active role of the fifteen republics of the Soviet Union; through more well-informed and vigilant interest groups and press; or through a combination of these and other checks and balances. Again, the degree of true reform in the general economic system will have a bearing on this issue. The current price and accounting framework allows for the possibility of calculating the level of expenditure on military services by the Soviet government. But in this environment “expenditure” is not synonymous with “cost.” That is, while the Soviet authorities may be in a position to provide a candid tally of ruble outlays on defense, should they so desire, no one in the Soviet Union is capable of unequivocally answering the question: What is the true cost in forgone opportunities to the national economy? It is the latter that is really at issue if accurate measures of the military burden are to be calculated.

A related policy concern is the potential effect that international assistance—either to achieve macroeconomic stabilization or to ease the process of economic transition in the Soviet Union—might have on the level of resources available to military purposes. This need not be viewed as a cold calculation of partisan interest on the part of possible Western donor governments. As indicated above, there is genuine concern as to whether successful transformation of the economy would be feasible in the presence of a large, hence probably unreconstructed, defense sector. The extent to which assistance might be sufficiently fungible to permit avoidance of otherwise necessary painful changes to the institutions of the defense industrial sector is a legitimate object of policy concern for all parties genuinely wishing to assist the Soviet reform effort.

Finally, the United States has a keen interest in restricted levels of Soviet exports of arms to the Third World. In spite of the apparent (which is not to say actual) ease with which the U.S.-led coalition was able to deal with the Soviet-equipped Iraqi army once battle was joined, the substantial level of armament that Iraq was able to acquire from its former patrons contributed to the adventurist course that proved so costly to all concerned. The costs to the United States would have been far less if Sadam Hussein had not enjoyed a level of equipment permitting him to indulge in optimistic delusions about Iraq’s relative power.

The serious economic problems confronting the Soviet Union, not the least on their international current account, would suggest that a renewed drive to increase sales of arms, the one class of successful Soviet industrial exports, might be expected. This may not prove to be a palliative for the Soviet Union’s maladies. It has proven notoriously difficult in the past for the Soviets to collect on export credits advanced to permit client states to purchase Soviet arms. Further, recent events may have reduced the relative attractiveness of Soviet
weaponry if offered on a cash and carry basis. Protestations by the senior Soviet military to the contrary, once again the recent experience of the Gulf War raises in the minds of arms purchasers the question of whether in a potential confrontation with a Western-armed military force Soviet weapons will be worth their costs. Yet, the potential trouble that large arms transfers to the Third World could create for regional stability in general, and U.S. interests in particular, makes this an appropriate object for policy attention.

The issues and analyses contained in this Note should contribute to a better understanding, if not resolution, of the controversies referred to earlier, as well as to more informed pursuit of these policy issues in the future. The sections are not intended to be comprehensive in their coverage of analytical concerns regarding the Soviet military and its relation to the Soviet economy. Yet, the reader will find that many of the central issues are touched upon with insight and in a manner suited both to provoke further debate and to highlight areas that should remain prominent in the policy agenda of the West.
2. THE GROWTH OF SOVIEIT GNP AND MILITARY EXPENDITURES IN 1970-1989: AN ALTERNATIVE ASSESSMENT

Dmitri Steinberg

This paper summarizes alternative estimates of Soviet GNP and military expenditures that were derived using a new methodology for compiling national accounts. The new methodology was specifically designed to uncover numerous Soviet state economic secrets about the real allocation of resources and price changes since 1970, based on a detailed analysis of Soviet national accounts. 1

This paper has the following major objectives:

• justify the need for alternative estimates
• outline the problem of measuring hidden inflation in the Soviet economy
• evaluate critically official Soviet statistics, focusing on published preliminary reports for 1989
• review CIA estimates of hidden inflation in the Soviet civilian and defense economy
• propose an alternative methodology for compiling Soviet GNP accounts in established, factor cost and constant prices
• compare CIA and alternative estimates of Soviet GNP
• analyze the origins of the current crisis in Soviet investment and consumer sectors, and
• discuss alternative estimates of Soviet military expenditures

Concluding remarks deal with the unresolved methodological problems as subjects for further research.

WHY ALTERNATIVE ESTIMATES?

According to official reports on the Soviet economic performance prepared by the USSR Committee on Statistics (Goskomstat), the average annual growth rates of Soviet GNP dropped from an impressive 5.5 percent to a still respectable 3.7 percent during the 1970s.

and 1980s. This robust long-term growth was allegedly sustained with an incredibly low rate of inflation, which decreased from less than 1 percent a year before 1985 to near zero since Gorbachev took office. Goskomstat reports also advertise a spectacular growth of household consumption during the 1980s (4.5 percent a year), but contain no data on the growth of military expenditures. In 1989 Gorbachev finally revealed that the defense burden is 9 percent of GNP and that, contrary to a planned 40 percent increase for 1986-1990, military expenditures have declined by 10 percent since 1987.

Goskomstat reports have been continuously contradicted by impressionistic accounts that have indicated that Soviet society has been in a big economic slump, at least since the mid-1970s, but has found sufficient resources to support one of the largest military buildups in peacetime history. The issue that has preoccupied economists for decades is how to reconcile official reports with impressionistic accounts. This issue has attracted considerable attention because the official statistics are the only available original source of systematically collected information on the Soviet national economy.

Of all the independent estimates challenging the official statistics, those prepared by CIA analysts in their annual reports to the U.S. Congress are considered to be the most reliable. As opposed to other estimates, the CIA data on the Soviet civilian economy are derived using a commonly accepted methodology based on the systematic reconstruction of GNP accounts. Similarly, CIA estimates of Soviet military expenditures constitute a detailed assessment based on technological means of collecting intelligence.

According to CIA reports, the average annual growth rates of Soviet GNP estimated by sector of origin fell from 2.8 to 1.7 percent during the 1970s and the 1980s, thus indicating a change in hidden inflation from 2.7 to 2.0 percent. CIA reports also indicate that hidden inflation in the Soviet civilian economy decreased from 2.3 to 1.7 percent but remained the same 5 percent in defense production.

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3 Narkhos for 1988, p. 17.
4 See Gorbachev's speeches published in Pravda, May 31 and December 12, 1989.
6 The rate of hidden inflation is estimated as the difference between the independent and official estimate of inflation. According to CIA estimates, the actual rate of inflation averaged 2 percent a year for the civilian economy. No information exists on the official estimate of inflation in the defense
Even though CIA reports provide a much more pessimistic assessment of the Soviet civilian economic performance than the official statistics, some economists believe that this assessment is still too optimistic in light of the mounting evidence about the current Soviet economic crisis. In recent years the accuracy of some CIA estimates was questioned increasingly in connection with the published work of the maverick Soviet economist Khanin.

As estimated by Khanin, Soviet production activities grew on the average by 2 percent a year in the 1970s and by 1 percent in the 1980s. He derived these surprising results using several unconventional methods of counting various physical outputs as a proxy for the overall national economic growth. However, none of Khanin's methods can be tested for reliability using conventional tools of statistical analysis. In this respect, Khanin's work remains vulnerable to criticism. Before Khanin responds to this criticism in a systematic fashion, his work cannot be accepted as a viable alternative to Goskomstat and CIA reports.

As opposed to Khanin's work, CIA estimates are based on the accepted GNP methodology and thus can be tested for reliability. Such a test is especially desirable for those CIA estimates that are based on Goskomstat's production and comparable price indexes. In addition, Soviet GNP accounts compiled by the CIA contain large "statistical discrepancies" that need to be removed in order to make these accounts internally consistent and useful for deriving independent estimates of military expenditures. Thus, there is a need to have alternative estimates that can be used (1) to test the validity of all Goskomstat's indexes, (2) to solve the problem of "statistical discrepancies," and (3) to determine how the new methodology affects estimates of Soviet GNP.

7For the discussion of some of these reports, which are largely impressionist, refer to Anders Aslund, "How Small Is the Soviet National Income?", a paper presented at the RAND-Hoover Symposium on the Defense Sector in the Soviet Economy held in March 1988.
9G. Khanin, "Ekonomicheskii Rast: Alternativnaya Otsenka, Kommunist, N17, 1986, pp. 85. Khanin's estimates are limited to material production sectors of the Soviet economy which account for more than 80 percent of GNP by sector of origin.
10For criticism of Khanin's work see Vestnik Statistiki, N4, 1987, pp. 3-12, N6, 1987, pp. 53-60.
In the process of compiling an alternative set of Soviet GNP accounts, I have proposed a hypothesis that allows us to solve the mystery surrounding Goskomstat's treatment of military expenditures in the official statistics. Specifically, I suggested that the problem of "statistical discrepancies" has risen as a result of using a commonly accepted assumption that data on the assembly of weapons are hidden somewhere in the published statistics on labor, wages, national income, and capital investment. I demonstrated that although the above statistics exclude data on the assembly of weapons for domestic use, these data are fully included in the published Goskomstat figure for total GNP.

After performing the detailed analysis of hidden inflation in the Soviet economy, I concluded that none of the published Goskomstat indexes compiled in comparable prices is reliable. This conclusion led to a different outlook on the Soviet civilian and defense economic growth since 1970, particularly on the growth of consumer industries and services, freight transportation, construction, investment into producer durables, and weapons procurement.

According to alternative estimates presented in this paper, the average annual price increase in Soviet consumer, investment, and defense sectors was 3.2, 4.4, and around 3 percent, respectively, in 1970-1989. These estimates indicate that average annual growth rates of Soviet GNP declined from 2.4 percent during the 1970s to 1.3 percent during the 1980s. The annual growth of the Soviet civilian and defense economy averaged 2.2 and above 3 percent during the 1970s and 1.2 and under 3 percent during the 1980s. Compared to CIA reports, alternative estimates suggest that the average annual growth of the Soviet civilian economy was slower by around 0.7-0.8 percent and that of the Soviet defense economy was faster by around 0.5-0.6 percent. At the same time, CIA estimates of the total level of Soviet defense burden as well as the structure of Soviet military expenditures are fully corroborated by alternative estimates.

Although the Soviet GNP data presented in this paper are readily comparable with the CIA data, the comparison with Khanin estimates is complicated by the fact that he failed to account for service and defense activities that are not registered in Soviet material product accounts (MPA). After converting GNP into the MPA format, I arrived at estimates that are notably higher, particularly for the late 1970s and early 1980s, than Khanin's. Further research must determine why alternative estimates presented in this paper differ from those of Khanin. Specifically, it needs to be explored whether in some unpredictable way Khanin was able to account indirectly for the impact of changes in quality on real growth rates. As known, the analysis of this impact is excluded from most independent estimates of the Soviet economic growth.
HIDDEN INFLATION: PROBLEMS OF MEASUREMENT

The driving force behind alternative estimates of Soviet economic growth has been the widespread belief that official estimates published by the Goskomstat are based on an inherently flawed methodology that is designed to advertise Soviet economic achievements rather than measure real rates of inflation. There are two commonly accepted types of hidden inflation that are not registered by Goskomstat officials. Hidden inflation occurs when: (1) price increases are not accompanied by similar increases in the quality of goods and services, and (2) prices remain the same but the quality of goods and services deteriorates. In addition, there are several other types of hidden inflation that are usually not taken into account. These types occur as a result of increases in fictitious output and money supply far in excess of the supply of goods and services. Fictitious output is a widespread Soviet economic phenomenon whereby enterprises grossly exaggerate their performance by fudging their output reports, especially those concerning the production of intermediate goods. Some fictitious output, such as excessive inventories of soft goods and durables whose low quality does not meet consumer expectations, must be taken into account in addition to hidden inflation. The same applies to excessive unfinished construction—another form of fictitious output that can be analyzed as the second type of hidden inflation.

Certain difficulties also arise in measuring unregistered price rises in service sectors. For example, the commonly accepted ton-kilometer index conceals the widespread cheating (prípíiski) and inefficiencies in the traveled distances that are recorded each year by freight transportation services. Hidden deterioration in the quality of many household services is uniquely manifested in the growth of employment that exceeds significantly the growth of capital and supplies. As is well known, the latter exert a crucial impact on productivity trends in service sectors.

As a rule, the dearth of available data on changes in quality makes it difficult to analyze the second type of hidden inflation. In response to mounting criticism, the Goskomstat recently made an effort to increase collection and evaluation of data on changes in quality of consumer goods and services. It is hoped that the Goskomstat will publish sufficient data on changes in quality in the near future that will make it possible to incorporate the analysis of the second type of hidden inflation into estimates of Soviet economic growth. Despite the dearth of data on changes in quality, there have been enough data published to analyze other types of hidden inflation by comparing indicators of the same output in value and physical terms. The underlying assumption behind such a comparison is that, when there is no inflation, the growth of output in value terms should not grow faster than the output measured in tons, square meters, horsepower units, etc.
There are three measures of output in value terms: gross value of output in producer prices (GVO), GNP by sector of origin, and GNP by end use. Although GVO measures the total value of output of particular sectors, GNP measures that part of GVO that corresponds to value added in these sectors. Total GVO exceeds GNP in established prices by the difference between: (a) production inputs that equal intermediate purchases of goods and services plus losses of capital, and (b) turnover, foreign trade, and other indirect taxes less subsidies plus imputed rent on owner-occupied housing plus certain hidden revenues of the second economy.

GNP by end use (without net exports) is defined as the sum of all goods and services that are not used as inputs during a given year. These include goods and services that are used for household consumption, fixed and other forms of investment, and government expenditures in civilian and defense areas. Even though annual additions of inventories and reserves include intermediate goods, the latter are counted as part of investment.

In order to measure the real growth of GVO, it is necessary to compare the gross output in value and physical terms for each year of the observed period, and for as many products with the same technological parameters as possible. The price index based on this comparison is referred to as the Paasche index. The growth of value added by sector of origin depends not only on changes in GVO but also on changes in production inputs. The method for measuring the growth of value added that takes into account changes in both GVO and inputs is referred to as the double deflation method. This method is considered more accurate than the commonly applied procedure based on the dubious assumption that the growth of inputs does not differ much from that of GVO. This procedure is usually applied in conjunction with the Laspeyres-type index, which is compiled by multiplying base-year prices and the growth of physical output.

There are two ways to estimate the growth of end uses. One way is to convert GVO for each sector of the economy from producer to purchasers' prices, which include net taxes, the delivery charge, and imports. The other way is to compare as many types of end uses as possible in both value and physical terms. If all the above estimates are performed successfully, then hidden inflation can be estimated as the difference between real and officially reported rates of growth.

The above discussion focused on measures of growth using prices established during economic transactions. The problem is that these prices distort the real cost of producing goods and services. Hence, these prices must be adjusted for the purpose of assigning a correct price "weight," i.e., the true contribution of each sector to economic growth. Prices adjusted in this way are referred to as factor cost prices. In market economies, prices are
usually adjusted for indirect taxes and subsidies. In the case of the Soviet economy where most prices are fixed by fiat, it is also necessary to adjust profits in proportion to employed factors of production.

EVALUATING GOSKOMSTAT ESTIMATES

As estimated by the Goskomstat, the growth of Soviet GNP under Gorbachev was 2.3 percent in 1985, around 3 percent in 1986-1987 and 1989, and 5.5 percent in 1988.11 This performance can hardly be cited as evidence of a long-term economic slowdown. The comparison of Goskomstat's estimates of GNP in current established and comparable prices indicates, however, that the above growth rates were derived using the highly improbable assumption that inflation in the Soviet economy was almost non-existent under Gorbachev.

Under mounting criticism for publishing distorted data, the Soviet government decided in 1989 to change Goskomstat's top leadership, which was publicly instructed by Gorbachev himself, to introduce glasnost in its official statistical reports.12 As of Spring 1990, the Goskomstat made several, albeit modest, steps in making its reports more objective. Most significant, Goskomstat published some previously secret input-output and budgetary data and compiled 1989 price indexes for 650 key commodities without taking into consideration changes in quality. The general price index increased by 2 percent, and the unsatisfied consumer demand for goods and services grew by 5.5 percent, resulting in an overall inflation rate of 7.5 percent.13

As reported by the new Goskomstat Chairman Kirichenko, the average consumer price index increased by more than 40 percent in 1971-1988 or by 2.3 percent a year. In 1986-1988 alone, prices rose 7.2 percent, including food items (11.7 percent) and non-food items (3.2 percent). He also noted that if sale prices were balanced with the unsatisfied household demand for goods and services (165 billion rubles in 1989), then prices would increase by at least 40 percent.14

Despite Goskomstat's increased openness, it still remains unclear how new price indexes were used for measuring the reported growth of Soviet GNP in 1989 or why these indexes were not utilized for reassessing the long-term growth. In addition, the Goskomstat has not yet revealed how it accounts for the growth of civilian and defense sectors financed by the state budget as well as for the growth of private production and service sectors. Until

Kirichenko and his associates decide to reveal more about their new methodology, published Goskomstat statistics will continue to lack credibility. The recently published Goskomstat report for 1989 confirms this observation.\textsuperscript{15}

According to this report, the growth in most production sectors ranged from minus 2 to plus 2 percent, including 1.7 percent in industry, 0.8 percent in agriculture, 0.5 percent for capital investment (including imports), minus 2 percent in freight transportation (the ton index), and 1 percent in passenger transportation. This explains why net product estimated by the Goskomstat for domestic material production sectors increased by only 1.5 percent.\textsuperscript{16} Soviet government officials also expected that the growth of weapons production declined by 4.5 percent in 1989.\textsuperscript{17} The conversion of defense industries made it possible to increase production of consumer goods at these industries by 11 percent in comparable prices.\textsuperscript{18} There was negligible growth in the derived number of those employed in state service sectors. In sum, total GVO measured by the Goskomstat should have grown in 1989 by no more than 1 percent, which was notably smaller than the reported GNP growth of 3 percent. How is it possible to reconcile this gross discrepancy?

Soviet economist Bolotin suggested that the explanation for the noted discrepancy lies in the possibility that there was a sharp decline in intermediate purchases.\textsuperscript{19} He noted, however, that intermediate purchases of goods by material production sectors declined by no more than 1 percent in 1989.\textsuperscript{20} Moreover, a part of the decline was offset by the growth of intermediate purchases of services. This suggests that, excluding foreign trade revenues, the growth of GNP estimated using the Goskomstat methodology should have been no more than 1.5-1.7 percent.

The most likely explanation for the noted discrepancy appears to be rather a sizable 8-percent growth of revenues from sales of imports and services provided to households in established prices, which the Goskomstat apparently fails to deflate. In addition, there was a spectacular growth of budgetary revenues resulting from the 25-percent increase in the sale of alcohol.\textsuperscript{21} There was also a sizable growth of revenues from private production and service activities, which were previously rendered illicitly. There is no valid reason, however, that

\textsuperscript{15}Pravda, 28 January, 1990, pp. 1-2.
\textsuperscript{16}Zhermova, op. cit., p. 1.
\textsuperscript{17}Izvestiya, August 1989, p. 4.
\textsuperscript{18}Pravda, 28 January 1990, p. 1.
\textsuperscript{19}Moscow News, N6, 1990, p. 10.
\textsuperscript{20}This was apparently based on the comparison of reported rates of growth of GVOs by sector and net material product (2.4 percent).
the growth of most of the noted budgetary and private revenues should be counted as contributing to the growth of GNP in factor cost prices.

The issue that must be explored is whether even the above estimated 1.5-1.7 percent growth of Soviet GNP is accurate. A large part of this estimate is based on the official statistics compiled in comparable prices and that must be tested for reliability. This applies particularly to comparable prices of the machinery and construction output.

As reported by the Goskomstat, there was, on the average, a 1-percent decline in physical output in the combined power and fuels sector as well as in basic industrial materials sectors producing metals, wood and paper, construction materials, and chemicals. The GVO of food (without alcoholic beverages), textiles, apparel, and footwear industries grew by around 1.5 percent in comparable prices. There was at least 1.5-2 percent decline in the reported numbers of produced machinery and equipment. Although the number of produced automobiles and agricultural equipment declined by 4 and 6 percent, respectively, the output of the consumer electronics industry increased by around 3-4 percent.

Given the noted conversion of defense industries, it appears that there was a sizable decline in the output of the entire machinery sector. The real size of this decline is probably impossible to determine due to the lack of published data on hidden inflation in Soviet computer and other electronic industries. Overall, it appears that the industrial GVO measured in factor cost prices declined by at least 0.5-1 percent in 1989, thus suggesting that hidden inflation in industry was around 22-22.5 percent. This notable decline explains why intermediate purchases of goods fell after rising sharply for decades.

Similar to comparable industrial prices, comparable construction prices are known to be designed to conceal significant hidden price increases. The most precise way of estimating the growth of construction output is to compare data in value and physical terms for as many types of buildings and installations as published in the official statistics. Because the detailed data on construction activities will be reported for 1989 later in the year, at this time it is possible to make only speculative observations using published data on produced construction materials and metals and continuing hidden inflation trends established during the past two decades.

The negligible growth of reported construction works corresponds closely to the near zero growth of produced materials used in construction. Hidden price increases estimated by Soviet planners have averaged around 1.2 percent a year in construction. These estimates,

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22 This can be deduced by comparing new construction prices introduced every 15 years. See Narkhoz for 1980, p. 364; and Narkhoz for 1985, p. 334.
however, fail to take into account the enormous waste and fictitious output that are manifested first of all in the spectacular increase in unfinished construction that brings no return on investment.

Given the peculiarly inefficient Soviet investment practices, it seems that the annual increase in unfinished construction ought to be excluded from GNP growth. In 1989 alone this increase exceeded 20 billion rubles or 18 percent of new construction works. As reported by the Goskomstat, installed capital measured in comparable prices declined in 1989 by 2 percent. The decline measured in physical units amounted to 4 percent in the housing sector, 9 percent in education, and as much as 16 percent in the health sector. The construction GVO had to decline by at least 3.5-4 percent.

A brief review of the Goskomstat report for 1989 indicates that alcoholic beverage and consumer electronics industries were star performers in the Soviet economy followed by the sugar, confectionaries, and apparel industries. A large part of the household purchases of sugar was used for manufacturing moonshine, while a 2-percent growth of the produced apparel was estimated by the Goskomstat in comparable prices that were probably not adjusted for hidden inflation. All other sectors of the Soviet economy reported negligible or negative growth.

In sum, the Goskomstat report indicates that the growth of consumer sectors was around 1 percent without taking into account changes in quality. Combined investment and defense uses fell by around 3.5-4 percent. Considering that household consumption accounts for less than 50 percent of total end uses measured in factor cost prices, it can be tentatively concluded that Soviet GNP actually declined by 1-1.5 percent in 1989. This was a disastrous performance even in comparison with the stagnation of the 1987-1988 period when the Soviet GNP grew by 1.3-1.5 percent.

Preliminary estimates thus suggest that in 1989 the Soviet economy was indeed in the midst of a deep crisis with the population enjoying no increase in living standards and increasingly addicted to alcohol and sugar “blues.” It will be possible to make more precise estimates after the publication of the Narkhoz edition for 1989 and after the Goskomstat clarifies how it deflates various GNP components both by sector of origin and end use.

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23Caidar, op. cit., p. 27.
24Ibid, p. 27.
EVALUATING CIA ESTIMATES OF LONG-TERM SOVIET ECONOMIC GROWTH

The CIA originally compiled Soviet GNP accounts for 1970 in both established and factor cost prices. The latter were derived by replacing profits earned in every economic sector with revenues assumed to be proportional to a certain uniform rate on capital (including inventories). Growth indexes for individual sectors were then estimated by combining 1970 base-year prices and physical indexes reported by the Goskomstat. Base-year weighted (Laspeyres) indexes were combined into general indexes for GNP by sector of origin and for three aggregate end uses: consumption, fixed investment, and government expenditures. CIA reports also contain separate indexes for Soviet military expenditures in constant factor cost prices. The review of Soviet economic performance contained in recent CIA reports relies on the data base derived by converting the original 1970 set of GNP accounts into 1982 prices.

Close examination of CIA reports reveals the existence of an internal contradiction: the average annual rate of growth for four major end uses—consumption, fixed investment, government, and defense—was significantly higher than that of GNP estimated by sector of origin. CIA analysts acknowledge this discrepancy, which they attribute to their inability to measure the growth of other "n.e.c." end uses of GNP: annual changes in inventories, reserves, and net exports. However, this is not a convincing argument. Over the past two decades, these other components made up only 4 percent of GNP and thus could not alter final estimates in a significant way. In addition, inventories and net exports grew on the average at a much faster rate than consumption and fixed investment, which further weakens the CIA explanation.

Of the many factors that cause the discrepancy between CIA estimates of Soviet GNP by sector of origin and end use, its methodological treatments of foreign trade, fixed investment, freight transportation, and government services appear as the most significant factors.

Foreign Trade

Although CIA estimates of total consumption and fixed investment include imports, the latter are excluded from CIA estimates of the Soviet GNP growth by sector of origin. It seems that the correct way to represent imports would be either to exclude foreign trade taxes from growth indexes altogether or to treat these taxes as a component of GNP by sector of origin in both established and factor cost prices. Because Soviet GNP in established prices includes net foreign trade revenues, both choices can be theoretically justified.
Fixed Investment

CIA reports contain two sets of estimates of fixed investment. The first set consists of independently compiled construction and domestic machinery indexes, and the second set consists of the official statistics on new fixed investment that Soviet economists consider as one of the least reliable estimates performed by the Goskomstat in comparable prices.\textsuperscript{26} As explained in CIA reports, the construction index was based on the official data on the physical output of construction materials, and the machinery index was compiled as the weighted average of numerous indexes estimated for particular types of machinery in physical units. Both of these CIA investment indexes were based on assumptions that are difficult to test for reliability. During the past two decades, construction enterprises had an incentive to use more rather than less expensive construction materials in order to fulfill the plan and to increase wages. This fact combined with frequent work stoppages that occur due to interruptions in the supply of material inputs, especially in climatically hostile regions, resulted in sky-rocketing increases in the unit cost of completed floor space. It appears that in order to measure such price increases, it is necessary to compare the output of construction enterprises in value terms with their output in physical units reported for around 35 sectors of the Soviet economy. In addition, CIA estimates must be adjusted for excessive additions to unfinished construction, which, as was discussed above, must be considered as a type of fictitious output. It is difficult to evaluate the CIA machinery index because (a) there is an insufficient amount of the officially published data on machinery output in physical units, and (b) CIA reports do not explain the methodology for determining machinery price weights.

Freight Transportation

The CIA uses the same ton-kilometer index published in the official statistics. As discussed above, there are reasons to believe that this index is much less reliable than the more simple freight (ton) index that the Goskomstat began using in 1989. The freight index can be derived independently for the 1970s and 1980s by combining individual freight indexes for major production sectors of the Soviet economy. Theoretically, these indexes must grow in tandem with interindustry flows expressed in physical units. To simplify the estimation procedure, it is desirable to compile freight indexes in conjunction with trade and distribution indexes.

\textsuperscript{26}For the recent discussion of investment indexes refer to B. Rumer, op. cit.; and V. Kantorovich, "Inflation in the Soviet Investment and Capital Stock Series," \textit{Soviet Studies}, April 1989.
Government Services

Service indexes compiled by the CIA are usually based on the published employment data not adjusted for changes in productivity. One exception is the science index, which the CIA adjusts using the independently derived data on the growth of material expenditures in science. As discussed above, to account fully for hidden inflation in Soviet service sectors it is necessary to determine productivity trends for all these sectors. These trends depend on changes in material supplies as well as in fixed investment. The low priority attached to such household service sectors as education, culture, and health during the 1970s and 1980s was most evident in the dramatically declining growth rates of both material supplies and fixed investment in these sectors.

EVALUATING CIA ESTIMATES OF SOVIET MILITARY EXPENDITURES

The coverage of defense sectors is by far the most problematic feature of Soviet GNP accounts compiled by the CIA. No mention of Soviet military activities can be found in published CIA tables on Soviet GNP, except for wages of military personnel and a footnote stating that there are three GNP categories where military expenditures are hidden—residual uses, fixed investment, and outlays on science.27

In 1970-1982, the GNP share of residual civilian uses (additions to inventories and net foreign currency accounts) increased from 4 to 4.5 percent in established prices and from 4.2 to 4.6 percent in factor cost prices.28 According to CIA reports, the GNP share of all residual uses increased from 11.4 to 14 percent in established prices and from 11.6 to 13 percent in factor cost prices.29 Residual military uses then increased from 7.5 to 9.5 percent in established prices and from 7.5 to 8.5 percent in factor cost prices. Although outlays on military R&D amount to around 1.8 percent of GNP, a close analysis of published Soviet investment data indicates that all types of weapons and defense construction are excluded from fixed capital registered in Soviet national accounts.30 It thus follows that the GNP share of current military expenditures, estimated by the CIA using unclassified data, amounts to 10 percent. Does this mean that data on the defense budget revealed by Soviet leaders is accurate and that the defense burden does not exceed 10 percent?

27CIA (1982), pp. 121-123.
28Steinberg (1988), op. cit., p. 35.
29CIA (1982), p. 41, and CIA, "Estimating Soviet Gross National Product: An Overview," 1989, p. 3. In this latter publication other uses are presented together with science and government administrative expenditures, which according to CIA estimates equaled 5 percent of GNP.
According to CIA estimates based on technological means of collecting intelligence, the Soviet defense burden increased from 12-14 percent in 1970 to 15-17 percent in the 1980s. These estimates are commonly accepted as reflecting the view of the U.S. intelligence community. The notable discrepancy between the two sets of estimates of military expenditures undermines the reliability of Soviet GNP accounts compiled by the CIA in 1970 and 1982 base-year prices. In addition, it makes it impossible to ascertain precisely why CIA estimates of the growth of Soviet GNP by sector of origin and end use differ by such a large margin.

CIA analysts acknowledge that difficulties with analyzing military expenditures as a GNP component are the result of several unresolved methodological issues concerning the mysterious wage and public revenue gaps and the exact size of business services, fixed investment, and capital losses. As discussed below, it is possible to resolve these issues using an integrated approach to Soviet national accounts.

Finally, there is a separate methodological issue concerning the conversion of Soviet military expenditures from established to current and constant factor cost prices. The CIA view that established prices have exceeded factor cost prices on Soviet weapons contradicts the overwhelming evidence about price practices in Soviet defense industries. For example, the Soviet arms control negotiator Oleg Grinevsky clarified that "factories producing military equipment are heavily subsidized," thus making it necessary to determine "the real prices for goods and services used by the military." Grinevsky's statement is corroborated by the Soviet GNP data, which indicate that defense production is fully financed by the state budget and that prices on weapons for domestic use exclude profits. This leads to the conclusion that factor cost prices on these weapons far exceed established prices. The difference between these two sets of prices equals imputed profit, which must be estimated not only for enterprises engaged in the final assembly of weapons but also for suppliers of weapons' components.

Similarly, there are reasons to believe that prices on Soviet weapons increase at an average annual rate that is notably smaller than the 5 percent estimated by the CIA. Estimates performed by Soviet economists indicate that prices on producer durables

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32 As presented in CIA (1987), p. 11, the two sets of prices appear to be the same in size.

increased by around 4 percent a year. The major factor causing this hidden inflation was the growth of profit far in excess of the rise in productivity and reliability of producer durables. Because this factor is not applicable to defense production sectors, it can be safely assumed that hidden inflation in these sectors was much smaller than 4 percent a year.

ALTERNATIVE METHODOLOGY

The above review of CIA reports suggests that it is desirable to compile a more complete and internally consistent set of Soviet GNP accounts and to design production indexes that are more sensitive to various forms of hidden inflation. Over the past several years I have developed an alternative methodology designed to compile such a set of GNP accounts by operating within the rigid constraints of the official statistics. My methodology entailed a four-stage procedure. First, I reconstructed original Soviet national economic balance (NEB) tables in established prices that are used by central planners for analyzing the Soviet economy. Second, I converted NEB tables into a GNP format that is significantly more detailed than the one used by CIA analysts. Third, I reevaluated Soviet GNP accounts in factor cost prices. Fourth, I converted Soviet GNP accounts into constant prices using the independently derived production price indexes.

In 1989, Goskomstat officials released new statistics that can be used to improve significantly the accuracy of estimates of Soviet GNP by sector of origin and end use. These statistics contain information on:

- Summary flows from the 1987 and 1988 input-output tables;
- Household and public consumption of selected goods in 1985-1987;
- Depreciation of capital operated in service sectors;
- Retail trade purchases excluded from current household consumption;
- The number of employees (4 million) in secret defense and other national security sectors that are excluded from the official statistics on labor and wages in 1989;
- The total level and structure of the defense budget, foreign transactions and deficits as accounted for in official budgetary statistics for 1989-1990; and
- Foreign trade revenues as a component of national income.

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I integrated the above data with the regularly published Narkhoz data on production, national income, and financial flows to compile a quite complete and internally consistent set of GNP accounts in established prices for each year of the observed period. The two major advantages of having such a set are that it can be used (1) to solve several methodological problems, thus improving CIA estimates of base-year price weights, and (2) to substitute the popular Laspeyres base-year index with the more accurate Paasche growth index and the double deflation method of estimating the growth of value-added by sector.

The reconstructed Soviet GNP accounts led to a discovery that has far-reaching implications: Data on Defense Ministry enterprises that assemble weapons for domestic end use have been excluded from all published statistics on labor, wages, GVO, and national income. At the same time, value-added in these sectors has been included in the published total for GNP. For the purpose of estimating the growth of the entire industrial sector, it is necessary to account for value-added in both published and unpublished machinery sectors. Other discoveries related to the treatment of defense sectors in the official statistics are as follows: the mysterious wage gap contains wages of secret defense industries, production of defense electronic components and weapons for exports is hidden in the other so-called "n.e.c." industrial sectors, current consumption by the armed forces is hidden in household consumption, and defense construction is excluded from published data on fixed investment but is included in the published total construction GVO.

To make precise estimates of the Soviet GNP growth, it is desirable to compile data on GVO and inputs for as many sectors as possible in both value and physical terms. I compiled such data through five major estimation steps: (1) compiling the GVO data in established prices for thirty aggregate production and service sectors; (2) disaggregating the GVO data into about 300 sectors using published official statistics on input-output flows, capital investment, growth rates and price changes; (3) comparing GVO in value and physical terms for around 230 production sectors resulting in the same number of producer price indexes; (4) aggregating the latter into 20 indexes, one for each major production sector of the economy using the derived price weights; and (5) compiling indexes for 10 major service sectors by combining the derived data on the growth of labor, material, and capital inputs weighted in proportion to their share in the total value of these services in established prices.

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37Steinberg (1990), pp. 4-5.
While compiling GVO indexes, I encountered a major problem in estimating hidden inflation in the machinery production sector. To overcome the lack of published official statistics on the machinery output in physical units, I decided to use the results of the extensive research on the subject of hidden inflation performed by four Soviet academic economists: Kheinman, Palterovich, Kornev, and Fal'tsman. By combining their data with officially published data, I compiled Paasche indexes for more than thirty major types of producer and consumer durables and interindustry components whose combined value constitutes around 50-55 percent of GVO of the entire MBMW (machine-building, metalworking, and machinery repair) sector. Then I estimated hidden inflation for published machinery sectors as the difference between Paasche and official comparable price indexes. Finally, I applied these estimates of hidden inflation rates as proxies for price rises in unpublished MBMW sectors. Estimates for the past two decades indicate that average annual price increases were as follows: total MBMW sector (excluding final assembly of weapons for domestic use), 2.5 percent; interindustry components, 1.6 percent; producer durables, 4 percent; and consumer durables, 3 percent.

Another major problem arose in estimating purchasers' price indexes for estimating growth of GNP by end use. As in the case with the machinery production, the problem arises because of the lack of published data on consumption and investment trends in physical units. The difference between unsubsidized purchasers' and producer prices equals the sum of indirect taxes, supply charges, and imports evaluated in actual purchasers' prices. In theory, taxes and supply charges should not grow faster than deflated producer prices. The derived producer price indexes can be justifiably applied to deflate taxes and supply charges for each production sector. Fortunately, the official foreign trade statistics contain sufficient information to estimate growth indexes for most imported goods. Again, the major exception is investment in producer durables. Because the coefficient for converting the value of imported machinery from foreign trade to purchasers' prices has remained around 1.00, it is reasonable to use the average index of world and CEMA prices. Because of shortennings of the available data, application of the Bergson factor-cost methodology was precluded. In its stead, I developed a new methodology based on adding profit in proportion to each sector's value-added estimated without profit. This part of value-added consists of wages and other


employees' income, social security deductions, and capital depreciation. One advantage of using the new methodology is that it enables one to take into account the contribution of labor as well as differences in productivity of capital stock that is evident in varying depreciation rates. Further testing and evaluation is required to ascertain whether the new methodology constitutes an overall improvement over the Bergson methodology.40

Compared to CIA's adjustment coefficients, coefficients based on the alternative methodology result in: (a) notably greater price weights for such labor-intensive sectors as machinery, woodmaking, textiles, apparel, and food industries, construction, non-housing services and defense, and (b) notably smaller price weights for such capital-intensive sectors as power and fuels industries, agriculture, transportation, trade, and housing. Applying the alternative methodology also leads to a structure of Soviet GNP by end use in current factor cost prices that diverges from that estimated by the CIA in the following proportions: household consumption and civilian government expenditures are 48 percent of GNP compared with 55 percent in the CIA estimates; investment is 36 percent versus the CIA's 34.5 percent; and direct defense allocations are 16 percent versus the CIA's 10 percent.

**COMPARISON OF ALTERNATIVE AND CIA ESTIMATES OF SOVIET GNP GROWTH**

Assessments of the long-term growth depend to a great extent on the choice of the base year, because choice of a later year leads to lower growth rates. This explains why, according to CIA reports, rates of Soviet GNP growth in 1970 prices are higher than in 1982 prices. Although recent CIA reports cite estimates made in 1982 prices, an average of 1970 and 1982 base-year estimates provides a more accurate picture of the Soviet economic performance during the 1970s. However, to preserve compatibility with recent CIA reports, I also present alternative estimates in 1982 prices.

The comparison between my (IDS) estimates and CIA estimates is summarized in Tables 2.1 - 2.3. The comparison of the two sets of estimates for GNP by sector of origin and end use is presented in Table 2.1. CIA estimates of Soviet GNP growth by sector of origin exceed my estimates by 0.8 percent a year in 1970-1985. The discrepancy between the two estimates is largest for construction, transportation, and services apparently as a result of the fact that CIA analysts did not account fully for all forms of hidden inflation that were discussed above. Although CIA estimates indicate that value-added in construction

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40 The proposed factor cost approach can be criticized on two accounts: it is partially based on the labor theory of value, which has few followers in market economies; and its reliance on depreciation rates is difficult to justify in estimating the net national product (NNP) in factor cost prices because the NNP excludes depreciation.
Table 2.1
IDS (Steinberg) and CIA Estimates of Average Annual Rate of Soviet
Economic Growth in 1982 Prices
(Base Year Is the Year Prior to the Stated Period)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IDS</td>
<td>CIA</td>
<td>IDS</td>
<td>CIA</td>
<td>IDS</td>
<td>CIA</td>
<td>IDS</td>
<td>CIA</td>
<td>IDS</td>
<td>CIA</td>
</tr>
<tr>
<td>GNP by sector of origin</td>
<td>4.8</td>
<td>4.8</td>
<td>2.1</td>
<td>3.1</td>
<td>1.6</td>
<td>2.3</td>
<td>1.0</td>
<td>1.9</td>
<td>1.6</td>
<td>2.4</td>
</tr>
<tr>
<td>Industrial Production</td>
<td>3.9</td>
<td>5.3</td>
<td>4.5</td>
<td>6.0</td>
<td>2.8</td>
<td>2.8</td>
<td>1.4</td>
<td>1.8</td>
<td>2.9</td>
<td>3.5</td>
</tr>
<tr>
<td>Machinery &amp; metal-working</td>
<td>6.8</td>
<td>5.8</td>
<td>6.6</td>
<td>7.4</td>
<td>2.7</td>
<td>4.0</td>
<td>3.0</td>
<td>1.3</td>
<td>3.8</td>
<td>4.2</td>
</tr>
<tr>
<td>Agricultural production</td>
<td>5.7</td>
<td>3.6</td>
<td>-1.2</td>
<td>-2.2</td>
<td>-0.3</td>
<td>0.0</td>
<td>2.2</td>
<td>1.2</td>
<td>0.2</td>
<td>-0.3</td>
</tr>
<tr>
<td>Construction</td>
<td>2.5</td>
<td>1.6</td>
<td>0.8</td>
<td>6.6</td>
<td>-1.6</td>
<td>3.5</td>
<td>-2.4</td>
<td>3.3</td>
<td>-1.1</td>
<td>4.4</td>
</tr>
<tr>
<td>Transportation</td>
<td>8.8</td>
<td>8.2</td>
<td>5.8</td>
<td>7.6</td>
<td>2.2</td>
<td>3.9</td>
<td>1.6</td>
<td>2.5</td>
<td>3.0</td>
<td>4.7</td>
</tr>
<tr>
<td>Services</td>
<td>4.4</td>
<td>4.6</td>
<td>2.2</td>
<td>3.7</td>
<td>1.3</td>
<td>2.9</td>
<td>0.3</td>
<td>2.3</td>
<td>1.3</td>
<td>3.0</td>
</tr>
<tr>
<td>GNP by end use</td>
<td>4.5</td>
<td>5.6</td>
<td>2.3</td>
<td>4.0</td>
<td>1.8</td>
<td>3.0</td>
<td>1.0</td>
<td>2.2</td>
<td>1.7</td>
<td>3.0</td>
</tr>
<tr>
<td>GNP by civilian end use</td>
<td>4.6</td>
<td>5.8</td>
<td>2.1</td>
<td>4.2</td>
<td>1.6</td>
<td>3.1</td>
<td>0.9</td>
<td>2.3</td>
<td>1.5</td>
<td>3.2</td>
</tr>
<tr>
<td>Per capita consumption</td>
<td>2.2</td>
<td>5.0</td>
<td>1.5</td>
<td>3.0</td>
<td>0.0</td>
<td>2.0</td>
<td>0.0</td>
<td>0.8</td>
<td>0.5</td>
<td>1.9</td>
</tr>
<tr>
<td>Fixed investment</td>
<td>6.0</td>
<td>6.0</td>
<td>4.6</td>
<td>5.2</td>
<td>0.9</td>
<td>3.3</td>
<td>0.7</td>
<td>3.5</td>
<td>2.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Direct defense allocations</td>
<td>4.2</td>
<td>4.0</td>
<td>2.7</td>
<td>3.0</td>
<td>3.3</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
<td>3.0</td>
<td>2.3</td>
</tr>
</tbody>
</table>

*a* In 1982 factor cost prices.

*b* CIA estimates of consumption and fixed investment are in established prices.

*c* Both estimates are based on the assumption that there were no changes in quality of goods and services.

increased by 4.4 percent a year, my estimates indicate a 1-percent decline. Relatively small differences in estimates for total industry and agriculture were probably the result of using the Paasche index in combination with the double deflation method, rather than the Laspeyres index.

The two sets of estimates differ even more significantly with respect to the growth of Soviet GNP by end use. CIA estimates result in a long-term growth rate of 3 percent a year, with the civilian economy achieving a respectable 3.2 percent growth and the defense economy, a modest 2.3 percent growth. In contrast, my estimates suggest that the overall growth was only 1.8 percent, with the civilian economy growing 1.6 percent and the defense economy 3 percent. According to CIA estimates, the growth of per capita consumption was 2 percent. My estimates suggest, however, that it was only 0.5 percent with practically no increase since the mid-1970s. Similarly, my estimates also point to a negligible growth of
fixed investment since the mid-1970s, whereas CIA estimates point to an impressive growth exceeding 3 percent a year.

The comparison of the two detailed estimates of value-added by sector of industry is presented in Table 2.2. This table provides an illustrative example of how, as a result of annual changes in the ratio between value added and GVO, using the base-year weighted Laspeyres index leads to growth estimates that are quite different from those derived with the Paasche index and the double deflation method. However, the notable difference between the two methodologies still cannot explain why IDS and CIA estimates diverge by such a large amount in the case of wood and "light" (textiles and apparel) industries. It appears that CIA analysts found no hidden inflation in furniture, other wood-making, and apparel sectors. There is no reason prices on furniture and apparel should grow more slowly than prices on wood and textile manufacturing sectors where hidden inflation has been rampant.

Table 2.2
IDS and CIA Estimates of Soviet GNP Growth by Sector of Origin (in 1982 Factor Cost Prices)\textsuperscript{a}

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IDS</td>
<td>CIA</td>
<td>IDS</td>
<td>CIA</td>
</tr>
<tr>
<td>Total GNP</td>
<td>1.28</td>
<td>1.28</td>
<td>1.11</td>
<td>1.16</td>
</tr>
<tr>
<td>Industry\textsuperscript{b}</td>
<td>1.22</td>
<td>1.35</td>
<td>1.22</td>
<td>1.30</td>
</tr>
<tr>
<td>Metals</td>
<td>1.06</td>
<td>1.35</td>
<td>1.31</td>
<td>1.25</td>
</tr>
<tr>
<td>Fuel</td>
<td>0.94</td>
<td>1.30</td>
<td>1.18</td>
<td>1.29</td>
</tr>
<tr>
<td>Power</td>
<td>1.10</td>
<td>1.47</td>
<td>1.49</td>
<td>1.41</td>
</tr>
<tr>
<td>MBMW</td>
<td>1.52</td>
<td>1.41</td>
<td>1.28</td>
<td>1.37</td>
</tr>
<tr>
<td>Chemicals</td>
<td>1.59</td>
<td>1.49</td>
<td>1.62</td>
<td>1.49</td>
</tr>
<tr>
<td>Wood and paper</td>
<td>1.28</td>
<td>1.37</td>
<td>1.00</td>
<td>1.13</td>
</tr>
<tr>
<td>Construction</td>
<td>1.27</td>
<td>1.35</td>
<td>1.27</td>
<td>1.26</td>
</tr>
<tr>
<td>Materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light industry</td>
<td>1.28</td>
<td>1.37</td>
<td>0.91</td>
<td>1.13</td>
</tr>
<tr>
<td>Food industry</td>
<td>1.25</td>
<td>1.32</td>
<td>1.31</td>
<td>1.16</td>
</tr>
<tr>
<td>Other industry</td>
<td>1.43</td>
<td>1.35</td>
<td>1.74</td>
<td>1.30</td>
</tr>
<tr>
<td>Agriculture</td>
<td>1.39</td>
<td>1.18</td>
<td>0.94</td>
<td>0.89</td>
</tr>
<tr>
<td>Construction</td>
<td>1.15</td>
<td>1.30</td>
<td>1.04</td>
<td>1.31</td>
</tr>
<tr>
<td>T &amp; C</td>
<td>1.43</td>
<td>1.43</td>
<td>1.29</td>
<td>1.37</td>
</tr>
<tr>
<td>Trade</td>
<td>1.52</td>
<td>1.41</td>
<td>1.20</td>
<td>1.26</td>
</tr>
<tr>
<td>Services</td>
<td>1.25</td>
<td>1.24</td>
<td>1.17</td>
<td>1.18</td>
</tr>
<tr>
<td>Defense sectors</td>
<td>1.32</td>
<td>1.22</td>
<td>1.22</td>
<td>1.12</td>
</tr>
</tbody>
</table>

\textsuperscript{a}Base year is the year prior to the stated period.

\textsuperscript{b}Excluding value added in sectors producing weapons for domestic use.
IDS and CIA estimates of the growth of per capita consumption in established prices are presented in Table 2.3. It must be emphasized that estimates based on factor cost prices lead to smaller rates of growth. The reason for this is that consumer goods with disproportionately large price weights, such as alcoholic beverages, tobacco, sugar, imports of apparel, and transportation services, were star performers in the Soviet economy. In comparison, such slow-growing sectors as the production of food, education, and health services are grossly undervalued in established prices.

<table>
<thead>
<tr>
<th>Table 2.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDS and CIA Estimates of Average Annual Growth of Per-Capita Consumption in the USSR (Established Prices)</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>Year</td>
</tr>
<tr>
<td>Total consumption,a</td>
</tr>
<tr>
<td>Food &amp; alcohol</td>
</tr>
<tr>
<td>Food items</td>
</tr>
<tr>
<td>Alcohol</td>
</tr>
<tr>
<td>Soft goods</td>
</tr>
<tr>
<td>Durables</td>
</tr>
<tr>
<td>Services</td>
</tr>
<tr>
<td>Housing and utilities</td>
</tr>
<tr>
<td>Transportation</td>
</tr>
<tr>
<td>Repair and personal care</td>
</tr>
<tr>
<td>Education</td>
</tr>
<tr>
<td>Health, etc.</td>
</tr>
<tr>
<td>Recreation and other</td>
</tr>
</tbody>
</table>

*aExcluding illicit incomes from privately provided services.

As is evident from Table 2.3, my (IDS) estimates are notably smaller than CIA estimates. I believe that CIA analysts did not fully account for hidden inflation in (a) domestic and import sectors supplying soft goods and consumer durables, which are valued in the official statistics in comparable prices, and (b) service sectors financed by the state budget. It is virtually impossible to account for hidden inflation in purchasers' prices due to the lack of published data on many consumed goods in physical units. For this reason, it appears desirable to supplement the procedure of deflating purchasers' prices used by the CIA with the more cumbersome, but at the same time more precise procedure based on deflating producer and import prices. In the service sectors, measurement is required not only for the growth of employment but also for that of other production factors—material and capital inputs.
Estimation results indicate a notable long-term slowdown in the rates of growth of all consumer goods and services. There was almost no growth in per capita consumption in the 1980s, and the growth in the second part of the 1970s was primarily a result of a phenomenal rise of alcohol consumption. The decline was particularly dramatic for per capita consumption of food items, education, health, and recreation services.

AN ALTERNATIVE ASSESSMENT OF SOVIET CIVILIAN ECONOMIC PERFORMANCE

Origins of the Crisis. The analysis of the long-term Soviet GNP growth suggests the existence of several turning points marking significant downturns in Soviet economic performance. The current Soviet socio-economic crisis did not occur suddenly; it evolved gradually over two decades and thus could have been predicted more than a decade ago. Its first signs were already manifested in the early 1970s, which witnessed a notable slowdown in the growth of consumption and fixed investment. Starting in the mid-1970s, the slowdown was replaced with a negative per capita growth, which by the late-1980s evolved into negative absolute growth.

Initially, the general economic slowdown resulted from the poor performance of apparel, food processing, wood-making, agricultural, and construction sectors. The robust performance of utilities, chemical, machinery, and transportation sectors was not good enough to reverse the general slowdown in the economy. The Soviet economy came to an inevitable halt in the mid-1970s when Soviet planners lost their ability to maintain the extensive type of economic growth, fueled during the preceding decades primarily by the rapid expansion of production facilities, particularly in industries that mine and process basic materials, including fuels, ferrous and nonferrous metals, wood and construction materials. Planners' ability to continue the expansion of production capacities was gradually undermined by increasing defense allocations and inefficient investment policies in consumer and agricultural sectors. By the late 1970s, planners could no longer find sufficient financial and material resources to meet sky-rocketing construction and operating costs in the mining and processing industries. The absolute decline in the Soviet economy was triggered in the 1980s by the inevitable decline in sectors producing basic industrial materials. This decline, combined with the disastrous harvests of 1979-1982, finally crippled the growth of the manufacturing and household service sectors.

Living Standards. To measure the real index in living standards requires allowance for changes in quality. Unfortunately, I did not have sufficient resources to collect a reliable data base on changes in quality parameters of goods, and services consumed by Soviet households. However, some tentative estimates can be made, based on interviews with
recent émigrés and tourists, news reports and published Soviet statistics. The collected evidence points overwhelmingly to a significant decline in the quality index ranging from 0.5-1.5 percent a year for many food items, soft goods, and consumer durables and to 1-2 percent a year for many services, including trade and health. By accounting for changes in quality it can be tentatively determined that the living standards of the Soviet people have declined by around 1 percent a year since the mid-1970s. This decline was further exacerbated by ecological disasters that have made a number of regions in the Soviet Union uninhabitable. In sum, it appears that the Soviet people were at least 15 percent worse off in the beginning of 1990 than they were in the early 1970s.

This relatively large decline in living standards still fails to reveal the actual collapse of the Soviet consumer sector in the 1970s and 1980s. To develop the full picture of the collapse I measured the growth of monetary incomes of Soviet households and the real share of consumption in total GNP. I estimated that the total monetary income of households increased from 195 billion rubles (b.r.) in 1970 to 530 b.r. in 1989, thus indicating an average annual increase of around 7.5 percent. During the same period total household savings increased from 73 to 450 b.r. or more than twice as fast as monetary incomes. The Soviet people kept around 320 b.r. in state banks, 110 b.r. in unorganized savings (rubles stashed at home) and 20 b.r. in bonds. A large part of these savings occurred because the Soviet people were unable to make purchases of goods and state-provided services of their choice. Despite this large increase in total household savings, stocks of inventories of unsold finished consumer goods more than doubled during the same period from 64 to 150 b.r.

If it is assumed that the Soviet economy absorbed excess increases of savings, then the comparison of the growth of monetary incomes and living standards would indicate that an average annual inflation rate in the consumer sector has been around 8 percent during the past two decades. According to the official Soviet statistics, this rate was around 1 percent a year. The comparison of real and official inflation thus points to the fact that hidden inflation in the Soviet consumer sector was around 7 percent a year.

Investment Trends. The gross inefficiency of the Soviet economy is manifested first of all by the fact that it spends as much as 36 percent of all allocated resources on investment into civilian and defense sectors. Given this gross inefficiency, it is not surprising that any decline in the growth of production capacities had such grave consequences for the rest of the Soviet economy. I estimate that the average annual growth of total new fixed

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41 This is based on information contained in M. Titarev, "Tak Skol’ko Zhe U Nas Deneg?" *Ekonomika i Zhien*, N9, 1990, p. 8.
investment declined dramatically from 5 percent in the 1960s and early 1970s to 0.8 percent after 1975. Furthermore, the growth of investment in housing, household services, science and defense sectors substantially exceeded investment in civilian production facilities and services. The actual growth of production-type fixed investment was less than 0.5 percent a year. This estimate is somewhat larger than that derived by Soviet economist Khanin, who believes that there was an absolute negative growth in fixed investment into production sectors. If Khanin's estimates are correct, then I probably underestimated the fictitious output of construction and machinery sectors. However, despite some differences between my estimates and Khanin's estimates, they are quite close compared with both CIA and official Soviet estimates, which indicate that the average annual growth of fixed investment was 3.4 and 3.7 percent, respectively.

The disappointing performance of the Soviet civilian construction and machinery sectors stands in stark contrast to the robust increase in the production of goods that were stored as inventories and reserves and that were delivered to defense sectors. Annual additions to inventories and reserves doubled in the 1975-1985 period alone, thus pointing to the fact that the gross inefficiency with which production resources are utilized in the Soviet economy has reached catastrophic proportions. In this light, it appears that a large percentage of accumulated inventories should not even be counted as economic growth.

AN ALTERNATIVE ASSESSMENT OF SOVIET MILITARY EXPENDITURES

The evidence discussed in this paper confirms two well-known facts: that defense sectors were star performers in the Soviet economy during the past two decades; and that Soviet leaders significantly underestimate the total defense claim on allocated resources. In 1970-1987, direct defense allocations (without hidden national security costs) grew from 49 to 120.5 b.r. in established prices and from 56 to 127.5 b.r. in factor cost prices, whereas the ratio between weapons procurement and total military expenditures increased from 46 to 52 percent.42 The average price increase was 3 percent with around 2.7-3 percent in the weapons production sector and with 3.2 percent in other defense sectors. I assumed that prices on weapons increased faster than average prices on the entire MBMW output but considerably slower than prices on producer durables. I estimated price increases on services provided to defense sectors in the same way as for other services financed by the state budget. The growth of Soviet military expenditures thus averaged 3.7 percent a year in deflated established prices and 3 percent in constant factor cost prices.

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42 Steinberg (1990b), op. cit., pp. 18-21.
It must be emphasized that, in contrast to civilian sectors of the Soviet economy, there was no notable slowdown in military expenditures during the observed period. A sharp decrease in defense construction took place in 1987 when there was a sharp rise in outlays on military R&D. There was some slowdown in procurement of weapons in 1976-1979. This slowdown was followed by a sharp rise in 1981 and 1984-1987.

During the 1970s and 1980s, the Soviet defense burden increased from 13 to 15 percent of total GNP in constant established prices and from 16 to 18 percent in constant factor cost prices that exclude net budgetary revenues from foreign trade. The defense burden equaled 17 percent of GNP in factor cost prices that include foreign trade revenues. This high level of defense allocations can be appreciated fully only after comparing military and consumer purchases of goods and services in the USSR and the United States. Although the ratio between total military and consumer purchases has been 40-45 percent in the USSR, it has been approximately 10 percent in the United States. Herein lies one of the major reasons (in addition to the inefficient investment policy) Soviet living standards have declined so dramatically compared with those in the United States.

The comparison of Soviet military expenditures in established and factor cost prices indicates that Soviet leaders have underestimated the total resource cost of direct defense allocations by around 20 percent. This does not even include additional costs needed to pay for various Soviet national security interests. In reality, total defense burden probably exceeds 17.5 percent of Soviet GNP in factor cost prices. This is almost twice as much as the level of expenditures cited by Soviet leaders.

CONCLUSIONS

This paper developed an alternative methodology and estimates of the long-term Soviet economic performance. The proposed methodology is based on integrating all published official statistics as the first step in compiling Soviet GNP and national product accounts. It was demonstrated that reliable estimates of Soviet economic growth depend to a large extent on the availability of data in current established prices. These data are needed not only for estimating annual price changes but also for deriving reliable price weights in factor cost prices. In this respect, the usefulness of these data has been commonly underestimated by specialists on the Soviet economy. I believe that the major flaw of the widely accepted methodology for estimating Soviet GNP stems from the fact that it was never designed to analyze Soviet national accounts in current established prices as an integrated system. As a result, economists have misinterpreted the official statistics.
In this paper I proposed a number of ways to improve the existing methodology. I also presented alternative estimates of Soviet civilian and defense economic activities in established and factor cost prices adjusted for hidden inflation using published data in physical units. Far from solving all the major methodological problems with estimating the Soviet economic growth, the proposed improvements must be viewed as a precursor to a large-scale effort focusing on the following issues:

1. Collection of reliable data on quality changes in Soviet consumer, investment, material supply, and defense sectors;
2. Development of methodology designed to integrate physical and quality indexes for particular sectors of the economy;
3. Evaluation of the full impact of financial factors on hidden inflation trends; and
4. Designing a new procedure for measuring the type of factor cost prices that better approximate the relative scarcity value of Soviet goods and services than factor cost prices derived using Bergson's and other methodologies.

I believe that the latter issue cannot be addressed adequately by operating within the constraints imposed by the central planning mechanism. The long-awaited introduction of the domestic market should provide a much better idea of relative price levels for Soviet goods and services.
3. WHY PERESTROIKA WILL REDUCE THE SOVIET MENACE

Anders Aslund

At this stage of its development, the Soviet Union is undergoing truly fundamental changes. Instinctively, most Westerners applaud the changes initiated by President Mikhail Gorbachev. The values he promotes seem to be those of the West: openness, marketization of the economy, a bit of denationalization, and significant democratization. A natural reflection is that it will be easier to live in peace with a USSR that is more similar to the West.\(^1\) Gorbachev has further reinforced this impression by formulating a defensive military doctrine. In December 1988, he took a big step toward better international relations by calling for their de-ideologization. He declared that the USSR would reduce its armed forces by 500,000 in two years.\(^2\) The logical consequence of such statements should be cuts in military expenditure, and at the outset of 1989, Gorbachev promised a unilateral reduction of Soviet military expenses by 14.2 percent and a cut in the production of armaments by 19.5 percent over the two-year period 1989-90. Then, ever more authoritative statements clarified that the Soviet Union was intent on reducing its military expenditure by 50 percent by 1995.

This picture seems quite consistent. We have every reason to believe that Gorbachev is sincere in his “new political thinking.” However, we cannot be sure that he will survive either politically or physically, and the whole perestroika hinges so much upon one single man. Helmut Schmidt has summed up the situation: “we do not know how long Mr. Gorbachev will last and whether or not we will afterward again see an aggressive or expansionist Soviet Union.”\(^3\) We need to identify and assess each precondition of the current Soviet policy to establish whether a return to a more aggressive foreign policy is possible.

A basic issue is whether the Soviet economy is strong enough to offer any alternative. Second, we need to estimate the share of national income devoted to defense and consider whether it may be raised significantly. Third, we shall investigate whether there is any possibility of a short-cut to escape its present economic dilemma. Fourth, the relationship

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\(^1\)Philip Hanson, “Perestroika and Western Security,” *Nordic Journal of Soviet and East European Studies*, Vol. 5, pp. 287-300, poses similar questions. Drawing on materials up to the summer of 1988, Hanson concludes that “perestroika contains nothing that Western policymakers need worry about on security grounds” (p. 300). Considering the developments since December 1988, this argument can be pursued much further now.


\(^3\)International Herald Tribune, December 17-18, 1988.
between the military and Gorbachev will be scrutinized with the aim of assessing the extent and implications of their differences. Finally, we shall discuss what a worst case scenario might imply.

HOW STRONG IS THE SOVIET ECONOMY?

Western study of the Soviet economy has long suffered from a major contradiction. On the one hand, the Soviet system has been discarded as utterly inefficient in qualitative systemic analysis. Any observer can see that the USSR is a semi-developed country far beneath the level of economic development of most OECD countries. To some observers, an economic crisis has long been obvious. On the other hand, the prevailing CIA estimates have set the Soviet GNP per capita just under half the U.S. level—higher than in many West European countries. These two perspectives cannot be reconciled. One must be flawed. Glasnost has shown that the Soviet economic crisis is even worse than the pessimists had been saying.

It has become abundantly clear that the CIA figures are far too high—both the relative level of national income and the growth rate. Most of the arguments critical of CIA estimates are now being proven correct. They were presented in the early 1980s by Alec Nove, Michael Ellman, Peter Wiles, and Philip Hanson in Great Britain and by Igor Birman in the United States. More than thirty Soviet economists have published articles or books that provide evidence that the CIA figures are excessively high in one regard or another.

So far, Soviet economists have published two sets of alternative statistics on growth rates (measured in net material product, NMP). The first set was elaborated by Grigori Khanin and Vasilii Selunin and the second by Boris Bolotin. They suggest average growth rates from 1950 to 1986 of 3.9 and 3.5 percent a year, respectively, whereas the CIA estimate (measured in GNP) is 4.1 percent a year for the same period. The difference might seem insignificant, but the disparity between the numbers provided by Khanin and Selunin and the CIA's figures has grown greater over time. For the period 1981-85, the CIA estimates growth of 1.8 percent a year, to compare with Khanin's 0.6 percent a year. Apparently, the

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CIA methodology did not compensate for the gradual decline in the quality of Soviet statistics from about 1974 until 1983. Khanin reflects the stagnation in per capita terms that Gorbachev and leading Soviet economists, such as academician Abel Aganbegyan, talk about. In particular, Khanin notes an "absolute decline in the national income in real terms in 1981-1982," which the CIA failed to notice. That very crisis seems to have brought about perestroika.

The differences of opinion over the relative level of the Soviet GNP are much greater. A World Bank project led by Paul Marer, with Robert Campbell as country specialist on the USSR, concluded that the Soviet GNP per capita amounted to 37 percent of the U.S. level in 1980. A simple extrapolation on the basis of official U.S. statistics for the United States, and Khanin's numbers for the USSR, implies that the Soviet GNP per capita had fallen to 33 percent of the U.S. level by 1986—to compare with 49 percent according to the CIA. Even so, the assumptions of the Marer study are rather conservative, and scant information works in favor of overestimation. Therefore, the actual Soviet GNP must be smaller, but how much smaller is an open question.

Selinin and Khanin have concluded that the Soviet national income is one-third of the U.S. national income, which would imply that the Soviet GNP per capita is only 28 percent of the U.S. level. This view has become widely accepted among Soviet economists, though in private conversations some suggest that the Soviet GNP might amount to only a quarter of the U.S. GNP. Clearly, both the relative level of the Soviet GNP and economic growth rates in the Soviet period will be revised downward as more evidence emerges. However, in a supreme display of bureaucratic inertia, the CIA publicized estimates based on its old discredited methodology in April 1990, as if nothing had happened.

Our pessimistic picture of Soviet economic performance matches a wide variety of known facts. According to the present Soviet Minister of Health, Yevgeni Chazov, the Soviet Union occupies the 50th place in the world in terms of infant mortality and the 32nd place in the world for average life expectancy.

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The Soviet consumption level is also very modest. Alexander S. Zaichenko of the Institute of the USA and Canada has undertaken a comparison of the Soviet level of consumption with the West, concluding that “the Soviet Union ranks between 50th and 60th in the world.” For food consumption, Zaichenko reckons that the gap between the United States and the USSR has increased during the last eighty years. We may conclude that the statistical evidence of poor Soviet consumption levels is overwhelming. The USSR cannot possibly rank better than 40th in the world in terms of standard of living—the perceptive Schluin suggests a ranking of 45th to 50th. Thus, a considerable deterioration has taken place in its relative standard of living since 1914.

How could the CIA be so wrong? The technical problems are almost infinite, but we may concentrate our attention on three major flaws. The first is that the CIA, with some rare exceptions, accepts physical Soviet data at face value. However, the notorious Soviet habit of fraudulent over-reporting of output (pripiska) implies that all physical data are somewhat exaggerated. The Moscow researcher Aleksei Sergeev, previously at the Institute of Economics of the Academy of Sciences, has argued that 5 to 25 percent of the stated production of raw materials never has taken place. Moreover, in general the Soviet economy is considered to be ruled by “the ratchet principle,” signifying “the planner’s” endeavors to raise gross production above the achieved level each year. The self-evident response is to increase padding and lower quality each year.

In particular, over-reporting must have increased palpably with the half-baked reform introduced in 1988. On the one hand, enterprises received new freedoms to determine their assortment and manipulate prices, and the pressure from above has eased at all levels. On the other hand, the demand for plan fulfillment has been retained. Thus, enterprises still possess their incentives to over-report, while the checks have withered. However, the CIA as well as most Sovietological economists have traditionally assumed that flaws are equal.

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15Rossiyskaya Rossiya, March 16, 1987. The CIA has disputed my interpretation, (CIA, Revisiting Soviet Economic Performance Under Glastra: Implications for CIA Estimates, Washington, D.C., September 1988, p. 23). However, the reason is that the CIA incorrectly argues that the admittedly vague concept of pripiska means theft and not fraudulent over-reporting.
16For an illuminating current example, see Leonid Ivanov, “Khitrye taisy agroprom,” Literaturnaya gazeta, May 11, 1988.
from year to year—"the law of equal cheating"—a highly unrealistic assumption.\textsuperscript{18} The later-deposed Chairman of the Soviet State Committee on Statistics, Mikhail Korolev, appreciated the CIA's reasoning on this point so much that he has quoted a whole paragraph in \textit{Prawda}.\textsuperscript{19} If anything, praise from the Soviet chief disinfomer on statistics, who is the foe of the whole Soviet reformist community, ought to make the CIA realize the biases of their assessments.

My second objection is that the CIA tries to recalculate the Soviet GNP on the basis of adjusted Soviet input-output tables. When any part of the input-output model is missing, analogies with the U.S. economy are made, notably for investment. However, the inefficient Soviet economy needs far more inputs to produce one unit than a market economy. For instance, in 1984 the Soviet economy used 3.3 times as much energy to produce one unit of GNP according to the UN Economic Commission for Europe,\textsuperscript{20} which is usually too conservative in its estimates of differences between Western and Eastern economies. I doubt that it is feasible to achieve satisfactory results with our present knowledge of Soviet input-output relations. Too many guesses have to be made, and too much poor data must be utilized. It appears more fruitful to exploit purchasing power parities, as in the Marer project.

Third, the possibly most important shortcoming is that the CIA, and even Khanin, assume that quality is constant or improving. This is contradicted by an abundance of observations, by ordinary price theory and by Janos Kornai's theory of economics of shortage.\textsuperscript{21} If excess demand prevails, producers are exposed to little pressure from controllers or clients. They will continuously be tempted to diminish their efforts and cheat more, thus reducing quality. Rising levels of education and technological development, which is tardy in the USSR, have much less impact on the economy than basic economic forces, such as the balance between supply and demand. Very few commodities in the Soviet Union are of such quality that they are even remotely competitive with commodities from newly industrialized countries. The issue is not whether quality declines but by how much. Because excess demand has risen in the 1980s, the decline in quality is likely to have accelerated.

\textsuperscript{18}The CIA has contested this point, after having distorted a quote of mine, thereby rendering my whole argument incoherent, (CIA, \textit{Revisiting Soviet Economic Performance Under Glasnost}, p. 13).

\textsuperscript{19}Prawda, January 30, 1989.

\textsuperscript{20}The ECE Energy Data Bank.

\textsuperscript{21}Janos Kornai, \textit{Economics of Shortage} North Holland, Amsterdam, 1980.
All these flaws lead to overestimation. Their composite effect is likely to be huge, but we shall hardly be able to specify it until the Soviet authorities undertake a proper international comparison of purchasing power parities, as the Polish authorities have.\textsuperscript{22} When I visited Goskomstat (the USSR State Committee for Statistics) on June 7, 1989, I was told that Goskomstat would join the UN International Comparison Project (ICP). For the time being, we can use only the Marer project for a ceiling estimate that, with a simple updating, would thus imply a Soviet GNP per capita amounting to 33 percent of the U.S. level in 1986, whereas the CIA figure was 49 percent for that year. Because the CIA insists on defending its old assumptions, methods, and estimates, which have long been proven inadequate, its estimates appear to be manifestations of bureaucratic politics rather than scholarship.

We may conclude that the Soviet economy is reminiscent of a relatively well-developed third world country, but it is amazing that such an economy has proved able to sustain the military might of a superpower. With a stagnant national income, the USSR is not likely to be able to keep up in the arms race for much longer.

**HOW MUCH GOES TO DEFENSE?**

If it is difficult to assess the national income, it is likely to be even more difficult to estimate Soviet defense expenditures.\textsuperscript{23} Here, the CIA has a deterring monopoly. The CIA's present estimate is that Soviet military expenditures absorb 15-17 percent of the Soviet GNP, but the CIA seems intent on reducing its estimate of this share to 14-16 percent.\textsuperscript{24} Much of the estimation procedures and the underlying data are secret. However, for several reasons, the CIA estimates of Soviet defense costs are likely to be better than its assessment of the national income.

The CIA numbers are based on intelligence reports on the equipment that the Soviet military possess. As the Soviets try to conceal their actual capacity, a certain underestimation is natural. One telling example is that the INF agreement evidenced that, apart from the SS-20s deployed, there were more than an additional quarter of them in stock that Western intelligence apparently had not noticed.


\textsuperscript{24}International Herald Tribune, November 15, 1989.
Western assessment of the quality of Soviet arms invariably appear exaggerated. Repeatedly, myths of the superior of new Soviet arms have been debased, when these arms have been put to the test in the Middle East, though the USSR keeps its best and most modern weapons for itself. In South Asia, however, India has done well using the Soviet arms against Pakistan using U.S. arms. Unlike other Soviet goods, arms are subject to severe quality control and are in great demand on the world market. Therefore, unlike other Soviet products, Soviet arms can almost compete with Western equivalents in terms of quality, although they are hardly as sophisticated as Western experts tend to believe.

In its estimate of defense costs, the CIA uses very high prices. However, this might compensate for the CIA's ordinary tendency to underestimate the Soviet use (and waste) of inputs. Contrary to what has previously been assumed in the West, Soviet specialists are now stating that economic efficiency is not higher in the armaments industry than in the rest of the Soviet economy. Notably, A.S. Isayev wrote in the journal Kommunist:

Unfortunately, regardless of the better technological equipment, the more highly qualified workers and a considerable scientific potential, the labor productivity, the capital productivity, the energy intensity and other synthetic economic indicators in the defense complex correspond on average approximately to the level of the economy as a whole and lag substantially behind the indicators of the industry of developed countries.25

No precision is possible in estimates of defense costs, but here different biases seem to compensate for each other. Therefore, the final CIA estimate in absolute value might be plausible. However, if the Soviet national income is much lower than the CIA has presumed, then the share of the national income that goes to defense is much larger than stated by the CIA.

In June 1989, at the Congress of People's Deputies, the Soviet leadership revealed new figures on Soviet defense expenditures. Prime Minister Nikolai Ryzhkov stated that total defense costs for 1989 amounted to 77.3 billion rubles. However, he left out military space programs, whose cost he assessed at 3.9 billion rubles, so the sum should be 81.2 billion rubles, that is, about 9 percent of GNP.26 However, the actual share of the GNP going to defense is likely to be much higher. The relative prices of armaments are known to be artificially low.

26Pravda, June 8, 1989.
Apparently, the Soviet leaders are wise enough not to believe their own statistics. In early 1989, two Soviet Politburo members told Western visitors that they thought Soviet defense expenditures amount to about 20 percent of the Soviet GNP. This figure seems to originate from Vasilii Selunin.\textsuperscript{27} On the basis of the assessment that the Soviet GNP is one-third of the U.S. GNP, Selunin has simply reckoned that the defenses of the two superpowers are approximately equal. Therefore, their costs in real terms are likely to be about the same. The U.S. military spending absorbs 6 percent of the U.S. GNP. The Soviet defense burden ought to be slightly more than three times as large, say about 20 percent of the Soviet GNP.\textsuperscript{28}

Previously, a number of Western Sovietologists—myself included—have been told by Soviet experts of some insight that the Soviet defense expenditures correspond to 30-40 percent of the net material product. Because the net material product corresponds to approximately 73 percent of the gross material product, and the Soviets usually speak in terms of total defense expenditures, this statement suggests that 22-29 percent of the Soviet GNP is allocated to defense.

Similarly, Rusla Khasbulatov of the Plekhanov Institute of Economics in Moscow has stated that members of his institute have calculated Soviet defense expenditures at about 200 billion rubles. The same figure was presented to the U.S. Congress by academician Oleg Bogomolov in April 1990. Apparently, this estimate refers to 1987, which would mean that the Soviet defense costs amounted to 24 percent of the GNP in that year. This estimate seems to be based on the identification of all defense expenditures of the state whose prices were then readjusted in order to cover all domestic costs and include a reasonable profit rate.

General Moiseyev has tried to explain why Soviet defense costs are much lower than the corresponding U.S. costs, but his explanations make it plain how far from opportunity costs Soviet defense prices actually are.\textsuperscript{29} Besides, it would be surprising if the Soviet authorities have managed to locate all defense costs so fast, considering how the defense sector is integrated into the rest of the economy.\textsuperscript{30}

If we use the CIA assessment of actual defense costs, but divide it with the assessment of the Soviet GNP relative to the U.S. GNP (that we derived from an updating of the Marer

\textsuperscript{27}Statisticheskaya industria, April 6, 1989.
\textsuperscript{28}Private conversation with Selunin, January 28, 1989.
\textsuperscript{29}Pravda, June 11, 1989.
project), we obtain a defense burden of 22-25 percent of the GNP. Such a military burden seems to match the circumstantial evidence.

For Western countries, such high shares have been reached and surpassed only in wartime, but what is the Soviet economy, if not a war economy?\textsuperscript{31} The allocation of a large part of the national income is difficult to trace. All the monetary incomes of the population specified in official statistics, added up to a mere net of 42 percent of the official assessment of GNP for 1987.\textsuperscript{32} There is great disagreement over the actual size of Soviet investments, because of subsidized prices and spurious inflation, but let us assume that gross investments do not account for more than one-quarter of the GNP. Amazingly, the USSR devotes barely 5 percent of its GNP to education and less than 3 percent to health. Some monetary incomes arise in the defense sector and much investment is allotted to it, but without any further elaboration we can establish that it is quite plausible that the defense sector absorbs about one-quarter of the GNP, or even more.

It is evident that for many years Soviet military expenditures have grown more rapidly than the national income. In June 1989, Prime Minister Ryzhkov stated:

While drawing up the plan for 1986-1990, because of the complex international situation then and our military doctrine, we were compelled, in a traditional manner, to envisage a faster growth of defense expenditures than of the national income.\textsuperscript{33}

In December 1989, President Gorbachev specified that in the Five-Year Plan for 1986-90 a growth in military expenditures of over 40 percent was envisaged, while the national income was supposed to increase by 22 percent.\textsuperscript{34} Expressed in annual increments, this amounts to an annual planned surge in defense costs of at least 7 percent, while the projected rise in produced national income was 4 percent a year. In reality, these figures contain hidden inflation. If we assume a hidden inflation of 4 percent in both categories, the USSR is left with a stagnant national income and military expenditures rising by 3 percent a year in real terms. This is exactly the pace that the CIA has assessed for Soviet real defense expenditures since 1977, and multiple Soviet statements make it plain that the national income has virtually stagnated since 1978. The picture is lucid despite shaky statistics. The USSR was expending far too many resources on the military. An immense and growing

\textsuperscript{31}Zbigniew Brzezinski, "Tragic Dilemmas of Soviet World Power," \textit{Encounter}, vol. 61, 4:10-17 (December 1983).
\textsuperscript{32} Calculated from Goskomstat SSSR, \textit{Narodnoe khoziaistvo SSSR v 1987 godu} (Moscow, Finansy i statistika, 1988).
\textsuperscript{33} \textit{Pravda}, June 8, 1989.
\textsuperscript{34} \textit{Pravda}, December 10, 1989.
share of the GNP went to the armed forces, while the economy was stagnant, on the verge of decline. At the same time, after the invasion of Afghanistan in 1979, the USSR could not possibly exploit its military strength for expansionist adventures. The determined Reagan armaments offensive outdid the USSR both in terms of quantity and technological sophistication. It forced the Soviet leaders to rethink. In fact, the Reagan armament campaign broke the back of the Brezhnevian system and compelled the Soviet Union to reform. This analysis is well in line with an excellent article by Richard Pipes published on the eve of the Gorbachev era.\textsuperscript{35}

Our reasoning does not belittle Soviet military capability, but it indicates the economic boundaries of its extension and of the old political and economic strategies. No other society has proved able—or willing—to devote such a large share of its GNP to armaments in peacetime. Besides, both the official Soviet statements and the CIA assessments indicate that the defense burden continued to grow until the late 1980s,\textsuperscript{36} when a breakpoint was finally reached. The defense burden could hardly be raised further, and a new course had to be chosen. Obviously, we should expect bold policy recommendations and great tensions among the Soviet leaders in such a situation.

\textbf{CAN QUICK ECONOMIC SUCCESS BE ACCOMPLISHED?}

President Mikhail Gorbachev keeps saying that there is no alternative to his policies, thereby indicating that many people think differently. I have identified five alternative economic programs favored by various members of the present Soviet Politburo,\textsuperscript{37} though one could subdivide these programs further. Gorbachev belongs to the group advocating radical economic reform, a marketization of the economy, some de-nationalization, and far-reaching democratization. In his first programmatic speech in December 1984, Gorbachev spelled out his general aim:

\begin{quote}
Only an intensive, highly-developed economy can safeguard the reinforcement of [our] country's position on the international stage and allow her to enter the new millennium with dignity as a great and flourishing power.\textsuperscript{38}
\end{quote}

Even at that early state, Gorbachev had realized that the USSR would have no chance of competing with the United States for the rest of the century. Its aim would be to become

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\textsuperscript{35}Richard Pipes, "Can the Soviet Union Reform?" \textit{Foreign Affairs}, vol. 63, 1:47-61 (Fall 1994); cf Richard Pipes, "Gorbachev's Russia: Breakdown or Crackdown?" \textit{Commentary}, vol. 89, 8:18-25.
\textsuperscript{36}\textit{International Herald Tribune}, November 15, 1989.
\textsuperscript{38}Mikhail S. Gorbachev, \textit{Izbrannye rechi i stati}, vol. 2 (Politizdat, Moscow, 1987), p. 86.
\end{flushright}
competitive after 15 years. He saw economic reform as the only means of maintaining the USSR a superpower, but reform is a long-term undertaking, implying fundamental changes.

At least two other groups in the Politburo preferred measures that seemed capable of providing quick results. Yegor Legachev and Viktor Chebrikov preferred disciplinary campaigns, apparently believing that the system was good but that people needed to be improved. A second alternative had appeared reasonably successful in the GDR. It signified technocratic modernization, with the streamlining and technical "perfection" of the existing system without marketization. Its leading proponent in the USSR has been Lev Zaikov, who appeared to enjoy broad support from the military establishment.

So far, economic policy has been an eclectic mixture of the different programs, because a variety of compromises have been reached in the Soviet leadership. From 1985 to 1987, the actual policy was dominated by the traditional disciplinarian and technocratic approaches.

One way of assessing the multitude of changes is to single out the most effective measure introduced each year. In 1985, an extraordinarily ruthless campaign against alcoholism was launched. It eliminated 8 percent of the volume of total retail sales in two years and a few percent of the budget revenues.

In 1986, an almost Stalinist campaign against so-called "unearned incomes" was set in motion. Its actual main targets became private agricultural plots and private market sales, and thus it damaged private enterprise. For two years, sales on the kolkhoz markets declined, whereas market prices of foodstuffs rose sharply. Both these measures were traditional disciplinary ones.

In 1987, a stern independent quality control (gospriemka) advocated by Zaikov was introduced primarily at engineering enterprises. This measure brought about such a sharp decline in output that the quality control was eased after as little as two months. Moreover, imports were severely cut from 1985 to 1987, notably consumer goods, because Soviet exports to the West had fallen by no less than 40 percent from 1985 to 1987 because of declining energy prices and shortfalls in oil production. Unrealistically high targets of the plan boosted money incomes, but not production, contributing to aggravated market imbalances.

During the first three years of perestroika, the measures having the greatest impact were essentially neo-Stalinist. They aimed at restricting supply, thus reinforcing market imbalances and reducing budget revenues. These measures did serious harm to the economy. The reason they were promoted was not that Gorbachev had pushed for them, but that a majority in the Politburo (including Gorbachev) had accepted them, and that they could be effectively implemented within the existing command system.
The basic reform legislation was promulgated in the summer of 1987, and the economic reform was launched in 1988. The most significant economic change in 1988 was that wages increased more than twice as much as had been planned. Moreover, rises in pay showed a strong tendency to accelerate—6 percent in the first half of 1988; 8 percent in the second half; and 10 percent in the first half of 1989. For the whole of 1989, the monetary incomes of the population rose by 12.9 percent.39

At the outset of 1989, the economic editor of the journal Kommunist, Yegor Gaidar, asserted: “the monetary incomes of the population have practically gone out of control.”40 In May 1990, President Gorbachev and Prime Minister Ryzhkov pronounced the same assessment.

The Soviet economy has entered into a vicious circle. Labor is scarce. Therefore, enterprises are keen on raising wages in order to attract, or keep, workers. The economic reforms have offered them this option by loosening control over wages. The workers have in turn started reinforcing this process of wage inflation by striking for higher wages. Because big enterprises do not face a hard budget constraint, but can often extort more money from the state, they give in easily to workers’ demands. One regional first party secretary complained: “In solving [labor] conflicts, everyone goes along with satisfying any demands in order to end strikes, even unjustified [demands], only to do away with tension. Nobody is responsible for this economic damage.”41

At the same time, inflation has gained speed. According to Khanin and Sel'kin's unpublished calculations, inflation in wholesale prices rose from some 4 percent in 1987 to 6 percent in 1988. There was a rather broad consensus among senior Soviet economists that retail trade inflation amounted to some 7 percent in 1988 and was likely to reach 9 percent in 1989. The official estimate of actual retail trade inflation is a ludicrous 2 percent.42 An inflationary process had been unleashed, but the gap between supply and demand is widening, because wages are rising faster than the current value of consumer supplies (see Table 3.1).

39Pravda, January 28, 1990. The income statistics must have been doctored for 1989. The average wage allegedly rose by 9.5 percent, payments to the population from social funds by 6.6 percent, etc., while total monetary incomes rose by 12.9 percent. We should focus on the last figure, because it can explain the obvious disarray on the market, and because the government has a strong interest in creating the illusion that wages are not rising sharply.


41I. Melnikov in Pravda, April 27, 1989.

Table 3.1
Increases in Wages, Retail Sales and Labor Productivity
(annual increase in current rubles, percentage)

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<tr>
<td>Average wage(^a)</td>
<td>2.9</td>
<td>2.9</td>
<td>3.7</td>
<td>8.3</td>
<td>9.5(^d)</td>
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<tr>
<td>Retail sales(^b)</td>
<td>2.1</td>
<td>0.4</td>
<td>1.1</td>
<td>6.9</td>
<td>6.1</td>
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<tr>
<td>Labor productivity(^c)</td>
<td>1.3</td>
<td>2.1</td>
<td>1.6</td>
<td>4.8(^e)</td>
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\(^a\) In current rubles; in the state sector.
\(^b\) In current rubles; state and cooperative trade.
\(^c\) Allegedly in fixed prices.
\(^d\) This figure is probably about 3 percentage units too low, because monetary incomes of the population rose by 12.9 percent in 1989.
\(^e\) Highly exaggerated number.

The Soviet economy has always been an economy of chronic shortages, but since 1988 the shortages have multiplied and become an acute concern. Inflation is a typical drawback in the initial stages of reform in a socialist economy, because monopolistic enterprises prefer to raise prices rather than production when partial deregulation offers them a choice. On the other hand, marketization presupposes moves toward market-clearing prices, but the Soviet economy is currently moving in the opposite direction—that is, toward more extensive rationing, because of the aggravated shortages.

Yuri Soloviev, at the time the first party secretary of the Leningrad region, made an illuminating assessment of the situation in the country in April 1989:

The chronic shortages of industrial commodities and foodstuffs are being aggravated, inflation is rising, dissatisfaction with the solution of the housing problem, and with the deterioration of the ecological situation, the increase in criminality and other problems are being sharply manifested.\(^{43}\)

Contrary to what Soloviev suggested, these effects were not “fruits of the years of stagnation” but the results of perestroika. Professor Viktor Bogachev of the Institute of Economics in Moscow has explained the mechanism:

The introduction of economic accounting under the conditions of all-powerful branch monopolies and deepening money-commodity imbalances leads to a limitation of the production of supplies, the boosting of prices, and an interministerial wage race in order to assure one’s “own” workers of a stable

\(^{43}\) *Pravda*, April 27, 1989.
share of a public pie that is shrinking. In the anticipation of these prospects, a panic run on money has started.\textsuperscript{44}

All indications of an acute shortage and financial crisis are apparent. The budget deficit has rapidly increased and was alleged to be about 14 percent of the GNP in 1989. A multitude of commodities have disappeared from the shops in the wake of intensified hoarding. Notably, soap, washing power, toothpaste, and virtually all kinds of consumer durables vanished in the winter of 1988-89. At the end of 1985, total stocks of finished consumer goods would have lasted 118 days, but by the end of 1987 they had declined to the point where they would have sufficed only for 88 days.\textsuperscript{45} The big run on retail stocks started in 1988. The rationing of meat, sausages, butter, and sugar has proliferated. The black market exchange rate of the ruble fell from five rubles to the dollar in the autumn of 1988 to thirty rubles to the dollar in the end of 1990, that is, about fifty times the official exchange rate. Savings deposits have steadily grown faster than retail sales (see Table 3.2). Regular statistics on the population's official incomes are not published, but the Soviet marginal propensity to save seems to be above 50 percent, indicating the prevalence of forced saving. Because ever less can be bought for money, incentives to work for money are quickly being eroded.

In parallel, massive personnel cuts in the central state administration were undertaken in 1988. From 1986 to 1988, the ministerial apparatus was reduced by 535,000 employees from 1.6 million to 1.1 million or by 33 percent.\textsuperscript{46}

However, at the same time the administration of associations and enterprises—just below the ministries—expanded by no less than 700,000.\textsuperscript{47} What else could be expected, when rationing was being expanded? As Yegor Gaidar has put it: "Retaining distribution by rationing millions of kinds of products produced in the country is the most reliable guarantee against a serious reduction of the administrative apparatus."\textsuperscript{48}

\textsuperscript{45}Goskomstat SSSR, Narodnoe khoziaistvo SSSR v 1988 g. (Moscow, Finansy i statistika, 1989), p. 124.
\textsuperscript{46}Ibid., p. 36.
\textsuperscript{47}Ekonomicheskaja gazeta, No. 18, p. 14 (April 1989).
\textsuperscript{48}Gaidar, "Khoziaistvennaia reforma, pervyi god," p. 23.
Table 3.2
Incremental Changes in Population's Incomes, Savings Deposits and Retail Sales
(in billions of current rubles)

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</thead>
<tbody>
<tr>
<td>Population's monetary incomes (^a)</td>
<td></td>
<td></td>
<td></td>
<td>42</td>
<td>64</td>
</tr>
<tr>
<td>Retail sales</td>
<td>8.1</td>
<td>7.9</td>
<td>9.4</td>
<td>24.9</td>
<td>37.3</td>
</tr>
<tr>
<td>Savings deposits</td>
<td>18.6</td>
<td>22.0</td>
<td>24.1</td>
<td>29.8</td>
<td>41</td>
</tr>
</tbody>
</table>


\(^b\) No complete picture of the population's monetary incomes can be derived from the official statistics. These two figures are obviously too low.

Indeed, at the Plenum of the Central Committee in April 1989, the then first party secretary of Azerbaijan, A.-R.Kh. Vezirov observed: "The number of telephone instructions has grown."\(^{49}\) Even so, the changes in the administration have been substantial. Although bureaucracy has not been reduced, disorder, uncertainty, and many bottlenecks have been generated. As a result, the top leaders themselves have been forced to interfere more frequently than before—in the words of the then first party secretary of Volgograd region, V. I. Kalashnikov: "Serious questions can be solved only after interferences from General Secretary Mikhail Sergeevich Gorbachev or the Chairman of the Council of Ministers Nikolai Ivanovich Ryzhkov."\(^{50}\)

The Soviet economy has already experienced five years of perestroika, and there can be little doubt about the results: both in quantitative and qualitative terms, economic performance has deteriorated. This is not surprising, although because of their limited insights into economic processes, the Soviet leaders are amazed. Assessing the growth rates has become even more difficult than before because of rising inflation, swift changes in foreign trade and turnover tax revenues, aggravated shortages, declining quality, and haphazard changes in statistical presentations. The confused state of the official Soviet statistics is illustrated by anomalies, such as the net material product (NMP) in current prices growing faster than NMP in constant prices in 1986, as if deflation had taken place (see Table 3.3). The Soviet GNP rates seem to have been added to offer even more exaggerated figures. Again, the CIA figures are steadily above Khanin and Selinunin's figures, which we see as the most plausible, and the discrepancy is growing. In any case,
Soviet GNP per capita has declined slightly since 1985, and the actual trend points downward, while official statistics become ever more inflated.

Table 3.3
Growth Of National Income 1981-89
(annual growth in percentage)

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<tr>
<td>Official NMP at</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>current prices</td>
<td>4.7</td>
<td>1.5</td>
<td>2.1</td>
<td>5.2</td>
<td>—</td>
</tr>
<tr>
<td>Official NMP at</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“constant prices”</td>
<td>3.2</td>
<td>2.3</td>
<td>1.6</td>
<td>4.4</td>
<td>2.4</td>
</tr>
<tr>
<td>Selunin &amp; Khanin:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NMP at constant</td>
<td>0.6</td>
<td>3.0</td>
<td>1.0</td>
<td>—</td>
<td>-4.0a</td>
</tr>
<tr>
<td>prices</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Official GNP at</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>“constant prices”</td>
<td>3.6</td>
<td>3.3</td>
<td>2.9</td>
<td>5.5</td>
<td>3.0</td>
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<tr>
<td>CIA: GNP at</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>constant prices</td>
<td>1.8</td>
<td>4.1</td>
<td>1.3</td>
<td>2.2</td>
<td>1.4</td>
</tr>
</tbody>
</table>


My own guesstimate in line with parts of Khanin’s methodology.

The Soviet economy has moved into a dead end. The command economy system appears to be exhausted. The only viable option seems to be to switch to a market economy with mixed ownership. Alas, for seventy years the USSR has deliberately demolished all institutions that are necessary for the running of such an economy. Before a change of system can be implemented, a rudimentary structure of market economy institutions and legislation must be adopted. This will take several years. Moreover, the destruction of the old system must precede the construction of a new system, and it is no easy task to subdue an immense, bureaucratic, hierarchical system of 15 million officials. In the meantime, the question is not whether the Soviet economy will grow, but rather by how much it will decline. These insights were not publicized in the Soviet debate until 1988.

Since the beginning of 1989, a dominant theme in the Soviet economic debate is how to move toward financial equilibrium. The discussion focuses on the consumer market. At the end of 1989, the Soviet government estimated the population’s pent-up demand at 165 billion rubles, corresponding to 40 percent of the retail turnover.51 Thus, to clear the consumer...

market only through price increases, the price level should be raised by some 40 percent, without any compensation. Other austerity measures could slightly mitigate the blow. However, after a prolonged debate on the necessity of price reform, aiming at market-clearing prices, the reformers have been politically beaten, and price reform has repeatedly been postponed. Apparently, the fear of large-scale strikes and riots is so strong that this option is considered impossible. Similarly, a currency reform has officially been ruled out, though discussion continues.

Instead a large number of alternative measures have been suggested. Savings and investments are to be promoted through sales of state property, such as shares and bonds, plots, construction materials, and apartments, as well as higher interest rates. Some consumer needs are to be satisfied through increased imports of consumer goods for Western credits and the conversion of the armaments industry to consumer industry. In addition, the reduction of defense expenditures, productive investment, administrative costs, and foreign aid are major proposals.

The combination of democratization and a severe economic crisis has subjected the Soviet regime to extraordinary strains. Its response has been to turn economic preferences upside down. The two overwhelming issues of economic policy are financial austerity and social reorientation, whereas all the old sacred cows—heavy industry (notably the armaments industry), raw material extraction and productive investment—are being starved of resources. Accumulation is supposed to be cut in half by 1995.52

In order to satisfy consumer demands, resources must be reallocated. The obvious source is the excessively large defense sector. In the Soviet budget for 1990, military expenditures have been reduced by 8.2 percent from 77.3 to 71.0 billion rubles.53 Large cuts—for instance 52 percent of the production of tanks (in relation to prior plans)—are planned for armaments production.54 The Soviet government is subject to such strong public discontent that it is almost forced to comply with popular demands for reduced armaments. At the same time, the absence of foreign threats and expansionary options implies that the USSR has little need for its vast military apparatus. It might as well be halved, as Moscow's new thinkers currently argue.

However, these measures are not likely to be sufficient, and there is no sign that the wage explosion will be contained. The Soviet economy is likely to plunge into an ever deeper crisis, with aggravated shortages and declining national income, until it becomes politically

52Ryzhkov in Izvestia, December 14, 1989.
53Izvestia, September 26, 1989; Pravda, November 11 and December 16, 1989.
54Pravda, September 26, 1989.
feasible to raise prices. Then it will presumably move on to an inflationary crisis, such as Poland and Yugoslavia are experiencing at present, though economic growth might recover somewhat. The inflationary crisis will probably continue until strong owners have emerged, that is, after state ownership has been drastically restricted. This is a somber perspective of an inevitable long-term economic crisis.

Apart from its charismatic leader (whose popularity is on the wane), the USSR has presently all the classic hallmarks of a pre-revolutionary situation: its economic and political system appears exhausted; the standard of living is declining; major structural changes are necessary; oppression has eased, and the people are responding with a holy fury to past injustices.

Western suspicions of Gorbachev's aims are frequently based on an assumption that it is feasible for the Soviet Union to achieve quick economic results and then switch policies. Such a strategy would amount to a technocratic overhaul of the existing system, but as we have seen Gorbachev does not favor such a policy. Moreover, it was tried with great vigor in the initial stage of perestroika, providing few benefits. It is not possible to run the anarchic Soviet economy with some kind of East German fine-tuning. The old command system is truly exhausted.

We can be absolutely sure that there is no easy way out of the present Soviet economic dilemma. Therefore, the peak of the Soviet military threat to the outside world has passed, and it is not likely to reemerge in the near future. Instead, the concern of the West should be serious disruption and national unrest in the USSR, causing destabilization in its surroundings. If Gorbachev does succeed, it will take many years before the Soviet Union acquires the relative economic strength the CIA thought it had many years ago. The collapse of an economic, political, and social system does not result in instant quick growth. The more bureaucratized the departing system, the longer the agony is likely to last.

GORBACHEV VERSUS THE MILITARY

A vital question is the relationship between the General Secretary and the military. The Sovietological community has been accustomed to General Secretaries, such as Nikita Khrushchev, Leonid Brezhnev, and Yuri Andropov, who had been linked to one front during the war with close friends among the top commanders whom they promoted, while other officers were against them. Thus, the conventional wisdom has been that the military and the party are approximately equally divided, so some military officers are for and others are against Gorbachev, and it is difficult to know which are more numerous. In 1987, Dale
Herspring published a lucid and well-documented article, which I shall use as a showcase of the conventional wisdom at that time. His conclusion is:

Though Gorbachev lacks Brezhnev's strong attachment to the military, he does not appear to be particularly anti-military.... From the vantage point of the marshals and generals, Gorbachev is not all bad. Although loss of status under his administration is doubtless unwelcome, as are his continuing efforts to cut back on military spending, most of the top military appear to recognize the need to rebuild the Soviet economy and streamline the military establishment.55

My thesis is virtually the contrary: Gorbachev could hardly be more anti-military; he has been so all along; and the military as a corporate entity has all reason to resist him. Too much of the discussion on this topic has been devoted to relative trifles such as preferred types of arms, strategy, and tactics, because Sovietologists are used to looking for minor rather than major differences among the Soviet leaders. Today, the diversity of views in the Soviet leadership appears greater than between opposing parties in most Western democracies. Therefore, we should focus on basic questions, such as preferred political system, economic strategy, basic objectives in foreign policy, and resource allocation.

If my thesis holds true, Herspring's corollary on foreign policy would also be nullified (as reality has already shown):

For the West, nothing will change in the immediate future.... In the long run, if the Gorbachev/Yazov team is successful in gaining military acceptance of perestroika, the military threat facing the West could increase significantly.56

To any political leader, the first priority must be to safeguard his power base. Unlike former Soviet leaders (with the possible exception of Konstantin Chernenko), Mikhail Gorbachev has virtually no known personal links to the military. Thus, there is no reason to assume that he has intimate friends in that very closed community. Of the twelve voting Politburo members in February 1990, only one (the liberal Aleksandr Yakovlev) had served in the Soviet Army.57

Gorbachev's former main competitor, Grigori Romanov, was on the contrary a creature of the military and the military-industrial complex and promoted their interests both in

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56Herspring, op. cit., p. 107.
57Deputaty Verkhovnago Soveta SSSR, Odinnadtstvi sozyv (Moseow, Izvestia, 1984), passim.
Leningrad and in the CC Secretariat. Romanov appeared to have a multitude of senior military protégés. He had served on the Finnish front as many of the old military élite had, including Marshals Nikolai Ogarkov and Sergei Sokolov. A little-noted fact is that Romanov was sent for a long visit to Ethiopia in September 1984, when Marshal Ogarkov was demoted. The world first heard of Ogarkov’s next appointment through Romanov at a reception in Helsinki.

It was Romanov who chaired the funeral commission of Marshal Ustinov, a post commonly linked to the appointment of the successor of the deceased. Marshal Sokolov appears to have been one of the lesser of Romanov’s protégés. At the time of Ustinov’s death, Gorbachev was in the United Kingdom and belatedly returned home.

One of Gorbachev’s first political goals was to oust Romanov. Immediately after having done so on July 1, 1985, he took the military élite to task at a meeting in Minsk. He is supposed to have spoken in favor of more moderate defense expenditures and streamlining, while reassuring the military command of his commitment to military development.⁵⁵

Since then, we have seen a successive reduction of the most senior military personalities. In 1985, the old giants Admiral Sergei Gorshkov and Marshal Vladimir Tolubko and Alexei Yepishev were retired, purportedly for reasons of old age, which did not hinder the surprising reelection of Gorshkov and Tolubko to the Central Committee in March 1986. A second stage of retirements began July-August.⁵⁶ A third stage reached a splendid crescendo with the sacking of the Minister of Defense, Marshal Sokolov on May 30, 1987, after the successful landing in Red Square by the young German pilot Mathias Rust. General Dmitrii Yazov’s appointment was followed by a long wave of retirements. In the winter of 1988-89, the retirements of the only two Marshals left in active service, First Deputy Minister of Defense Sergei Akhromeyev, the Chief of the General Staff, and Viktor Kulikov, the Supreme Commander of the Warsaw Pact, and a number of ensuing personnel changes may be seen as a fourth wave.

The Soviet military command has undergone an extraordinary rejuvenation. The Herspring explanation is essentially that Yazov is Gorbachev’s man, and that he was appointed because of “his support for the principles of perestroyka” and “his intense interest

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⁵⁵Seweryn Bieler and Joan Afferica, “The Genesis of Gorbachev’s world,” Foreign Affairs, Vol. 64, no. 3, pp. 605-644, (1985) appears to be the original source.
in personnel-related questions. As time passes, this explanation grows ever more untenable.

What we are seeing is not only a rejuvenation of the military leadership, but successive efforts to reduce its stature. The Minister of Defense is no longer a voting member of the Politburo, as was the case from April 1973 until December 1984. There are no full Marshals left on active duty, which is probably by Gorbachev's design. At the CC Plenum in January 1987, Gorbachev spoke ambiguously about the military, while the resolution of the Plenum lauded the military abundantly. Open criticism of military institutions, such as military elite schools, ensued in the Soviet media, including Pravda. An early peak was reached on February 22, 1988, one day before the "Day of the Soviet Army," when Pravda published five letters highly critical of the military on its front page.

In protocol terms, the military was marginalized during Gorbachev's early years in power. Traditionally, about ten senior officers have stood on Lenin's mausoleum on May Day and November 7, with the Minister of Defense immediately to the right of the General Secretary. Since May 1, 1987, their number has been reduced to four and a large number of civilian politicians have stood between the Minister of Defense and General Secretary Gorbachev.61

Around the 40th anniversary of the Victory in May 1985, the military prominence in all media was deafening. The contrast with Victory Day of 1987 could hardly have been greater. Official attention was scant. The war veteran reunions were largely removed from the center of Moscow to two parks further out. The many brass bands were primarily civilian, one was even from the GDR. The principal public meeting took place in Manege Square and not in Red Square. Not a single uniform was seen on the podium. It was the Minister of Culture, and not the Minister of Defense who presided.62

Moreover, General Yazov does not speak in favor of Gorbachev's political platform. In December 1987, he even praised an obnoxious letter by the Russophile writers and Legachev supporters Yurii Bondarev, Vasili Belov, and Valentin Rasputin.63 Gorbachev saved Yazov's election as Minister of Defense during the Supreme Soviet's scrutiny of him in July 1989, but Gorbachev did so without lauding Yazov, thus underlining his limited powers. The examples could be multiplied. Yazov seems interested only in discipline and personnel changes.

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62 I was there on both occasions.
apparently not even comprehending the need for economic reform. He appears to have been chosen as a transitional figure suitable for a quick reduction of the stature of the military.

The many new top commanders do not appear much more reformist. Several come from Yazov's Far East or other desolate areas with little standing in the military establishment. They have little authority of their own. In the Congress of People's Deputies, the generals have formed a coherent and very conservative bloc. Major General M. S. Surkov even complained at the Second Congress of People's Deputies in December 1989 that the title "general" had become a word of abuse and he appealed to the deputies not to divide themselves into civilians and military men.  

Academician G. A. Arbatov, who is close to Gorbachev, attacked top officers Yazov, Moiseyev, and Chornavin by name at the Second Congress.  

Gorbachev has played out the military so elegantly that we have all reason to believe that it was his original intention.

The standard view among Western military analysts has been that Ogarkov was some kind of economic reformer. I have found no evidence of this. In economic terms, he sought a reallocation and streamlining, fitting the economic programs of technocratic modernizers, such as Grigori Romanov and Lev Zaikov. Gorbachev, on the contrary, is a radical reformer wanting some kind of market economy with mixed ownership and democratization. This misconception is based on an absurd tendency among Western analysts to conclude that all new appointees are Gorbachev men and that they all have the same program. Joseph Berliner's analytical framework should have made such mistakes superfluous long before the Gorbachev era.  

As a result, such analysts have failed to see how reformist Gorbachev really is in comparison with the others, and how weak his political power is.

In reality, the military has a strong, vested interest in the preservation of the "command-administrative system." It is construed as a war economy, complying with the hierarchical and administrative military way of thinking. Professor Peter Wiles has made the point that the military is the only Soviet customer who can purchase in a market, choosing between alternative suppliers and effectively rejecting unsatisfactory equipment. Thus, the military largely escapes suffering from the dysfunction of the system. Moreover,

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64 Izvestia, December 16, 1989.
65 Izvestia, December 19, 1989.
67 One of the best examples is Jerry Hough, Russia and the West: Gorbachev and the Politics of Reform (New York, etc., Simon and Schuster, 1988).
no other economic system has proved able to allocate such a large share of the national income to the military sector in peacetime.

If Gorbachev's call for democratization—first pronounced on December 10, 1984—means anything at all, it antagonizes the military. The Soviet military system is, of course, extremely authoritarian and hierarchical. Academician Roald Sagdeev has pointed out that the authoritarian military service renders young men unfit for creative work. The army has long ignored the human costs they incur on society, but Gorbachev's supporters have put this question on the agenda. People seem to have forgotten that in the spring of 1985, there were strong demands for the rehabilitation of Stalin (even forcing Gorbachev to mention Stalin favorably on the fortieth anniversary of the victory over Germany). These demands were obviously promoted by the military and the Romanov circle, and they were contrary to everything Gorbachev stood for. This episode demonstrates the depth of Gorbachev's differences with the military.

Similar contradictions are apparent in foreign policy objectives. The Soviet army is the reincarnation of imperial Russian nationalism. The officer corps is heavily dominated by Slavs. They are hardened by severe and desolate lives on the ramparts of the empire. Gorbachev's various peace and disarmament initiatives run counter to their aims. A vivid illustration of these differences was displayed at the 19th Party Conference in the summer of 1988. The commander of the Soviet army in Afghanistan, General B.V. Gromov, vigorously defended the Soviet invasion and refuted allegations that the Soviet Army had lost in Afghanistan, but one of Gorbachev's foreign policy advisers, academician Yevgenii M. Primakov, on the contrary, suggested that it had been wrong to invade Afghanistan, and that the operation had failed.  

Two relevant topics, which have been well-analyzed in the West, are the new military doctrine and changed attitudes to defense allocations. Brezhnev's pledge to ensure that the military had everything it needed has been replaced by varying but ever less ambitious formulations by Gorbachev. In March 1985, he said that it was "important to maintain the defense capability" at a deterring level. In October 1985, after having retreated for a while, Gorbachev favored "the maintenance of the defense power of our Motherland at a proper level." At the 27th Party Congress in February 1986, Gorbachev stated that the party

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leadership “is devoting undiminished attention to the defense capability of the country . . .
and the strengthening of the military discipline.” Finally, in January 1989, he came out
into the open: “We will have to look over our expenditures on defense as well. A preliminary
study shows that we can cut them, without lowering the level of security and defense
capability of our state.” Once again, we see that Gorbachev appears to have worked in the
same direction all the time, but he has carefully concealed his radical intentions.

In the same vein, Gorbachev revealed in June 1985 that only 5 percent of productive
investment was allocated to civilian machine-building, and he urged an increase of this
share. With the help of published Soviet statistics, we can deduce that military machine-
building obtained no less than 58 percent of all investment in machine-building from 1981 to
1985. The armament industry has been told ever more sternly to produce more consumer
goods, raising this share of its production from traditionally 40 percent to 60 percent in 1996
and converting 320 large armament factories wholly or partially. Technology favored by the
military, such as heavy tractors and medium-sized trucks run on petrol, have become
severely criticized by the Gorbachev camp. Also on this issue, the signs of far-reaching
disagreements between Gorbachev and the military are abundant.

Our conclusion is that from the very outset Gorbachev wanted to cut the military down
to size, both politically and economically. He has done so with such elegance and skill that
most Western observers failed to realize what was going on, until it became obvious through
Gorbachev’s announcement of substantial military cuts at the United Nations in December
1988. We can assert, without hesitation, that Gorbachev wants a much smaller military
sector in every sense, something that would also suit the rest of the world. The Soviet
military threat to the outside world has swiftly diminished, though mishaps in the reform
process, notably involving nationality problems, may very well catapult the military into the
seat of power.

WHAT DOES THE WORST SCENARIO IMPLY?

So far, we have tacitly assumed that Gorbachev will stay in power. If this assumption
holds true, we hope we have shown that the Soviet menace belongs to the past, even without
discussing the swift dissolution of the Soviet empire in Eastern Europe or KGB or GRU
foreign operations. But what will happen if Gorbachev is ousted?

73*Pravda*, February 26, 1986 (emphasis in the original).
74*Pravda*, January 8, 1989.
75Mikhail S. Gorbachev, Korennya vopros ekonomicheskoi politiki partii (Moscow, Politizdat,
One option would be some kind of revolution from below or through democratization. It would be directed against the military leadership, and it would weaken Soviet military might for a long time.

The Gorbachev revolution has gone so far that a coup d'état by conservative communist party leaders does not seem very likely any longer. Their last feasible opportunity might have been the first CC Plenum in 1990.

Thus a military coup looks more likely, but in a somewhat longer perspective. If the country slides into chaos, the military will be prone to take over power sooner or later. Here, Poland has set a precedent. After the massacre in Tbilisi on April 9, 1989, the military was barred from the maintenance of public order, but in January 1990, the military stepped in to reestablish order in Azerbaijan. Soldiers make sure that vital railroads function and might also be involved in electricity generation. Moreover, a renewed pride is to be found in military articles since the end of 1989.76

Still, the top officers lack authority, and the armed forces are traditionally tightly checked by the KGB and the party. The USSR suffers from a post-Afghanistan anti-military depression. For these reasons, a military coup cannot be excluded, but it would be likely to occur when the USSR becomes so weakened that its leaders are completely preoccupied with keeping the country—or its remnants—together. Besides, one lesson from Poland is that the military rule turned out to be much softer than anyone had anticipated. Even in the case of a military coup, it is hard to detect any Soviet menace to the outside world worth considering.

CONCLUSIONS

This analysis allows us to draw far-reaching conclusions. Our starting-point is that the Soviet economy is much weaker than the outside world has believed. At the same time, the military strength and cost might have been almost as large as Western experts believed. Therefore, the military burden has grown too heavy for the Soviet economy. It was possible to win the arms race, and under President Ronald Reagan the United States did so. Gorbachev and his reforms are a result of this victory. However, many U.S. conservatives who favored the arms race refuse to acknowledge their own victory, because they seek more armaments and are not enthusiastic about Soviet reform.77 Many U.S. liberals perceive the sincerity in Gorbachev's endeavors, but they refuse to acknowledge that Gorbachev is a fruit

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76 Pravda, December 9, 1989.
of the arms race, which they opposed. Thus, neither side is inclined to make a realistic analysis, though the truth is coming through.\textsuperscript{78}

If we do not stop looking upon Gorbachev as an almighty czar, and the Soviet leadership as an obedient monolith, then we will understand little more of future Soviet developments than most people did of those just passed. For long, Gorbachev was an extreme reformist in the leadership, but he was forced to suppress his actual program. However, since the summer of 1989 he has been ever more outflanked by radical democrats and liberals, making Gorbachev look like a centrist communist. Leading Soviet reform economists think that no economic system more socialistic than the Swedish market economy is likely to work. Gorbachev probably shares these views, as is partly indicated by his positive reference to Swedish and Norwegian cooperatives, and the radical reform program presented by Deputy Prime Minister Leonid Abakin in October 1989.\textsuperscript{79} He clearly prefers the difficult, but, in the long run, rational option of radical marketization and a certain denationalization. By May 1990, the issue was no longer whether a market economy was necessary, but how to introduce it. Still Gorbachev has failed to depart from the political middle ground, and he is no longer perceived as a plausible radical by the population.

The Soviet leadership is virtually atomized, and the approaches of various leaders to the economic crisis are very different. The conservative and reactionary programs are obviously ineffective. Similarly, the middle way of technocratic modernization of the existing system—which did reasonably well in the GDR—has proved useless. The economic crisis is so deep that there is no easy way out, and a market economy seems the inevitable final choice. Even so, it is inconceivable that the Soviet Union will recover and gain strength within a few years. A lengthy and arduous destruction of the command system must precede any economic recovery.

The big danger for the Soviet Union is a precipitate fall in national income, caused by an administrative breakdown and aggravated shortages. A repetition of the Polish economic crisis of 1980-82 is a real risk, which probably would imply that several republics would slide out of the Union.

An important but for long largely overlooked fact is that Gorbachev has been at loggerheads with the Soviet military over virtually everything throughout his reign. Therefore, Gorbachev has a strong interest in cutting the military down to size, both politically and economically. Since the arms race has been lost, the USSR has little hope for


gaining anything through military aggression after Afghanistan. If offensive war is out of the question, the Soviet Union may as well switch to a defensive military doctrine. For defensive aims, much less military strength is needed, making partial unilateral disarmament a rational option.

The obvious conclusion is that the military threat posed by the Soviet Union against the outside world has already decreased, although only limited cuts have gone into effect. Gorbachev and his reform program are even better for the rest of the world than has generally been perceived. The prime danger posed to other countries will probably be effects of destabilization within the Soviet Union, including the possible ouster of Gorbachev. Even if that would happen, the traditional command economy appears to have been irreversibly discredited, both politically and economically, and no other system can award the military such an overwhelming priority. The Soviet Union is bound to become a more “normal” and less ideological state.
4. THE PROSPECTS FOR TECHNOLOGICAL INNOVATION IN SOVIET MILITARY R&D IN THE 1990s

Stephen M. Meyer

INTRODUCTION

In the last few years we have witnessed some truly significant shifts in Soviet military and military-economic policy. Military doctrine and strategy have been substantially altered, forces have been withdrawn from Eastern Europe, force structures have been changed and cut, weapons “buys” are being scaled back, military personnel levels have been reduced, military spending has been reduced, and defense industries are being pushed to diversify in order to increase the output of civilian goods.

Without denying the significance of these changes for the present, many Western observers continue to wonder about their durability and longer term implications. Couldn’t a new Soviet leader revise military doctrine yet again, returning it to its more familiar aggressive and expansionist style? Can’t force structures be rearranged to increase offensive potential, weapons procurement accelerated, conscription increased, and military spending raised? The answer to all these questions is: Of course, individual policies can be reversed. But this begs the larger, more important, question: Can policy reversals such as these return the Soviet Union to the high priority “defense track” it was riding in the 1970s?

For the contributors to the *Impoverished Superpower*, the answer appears to be no.¹ Unless the Soviet Union continues to pursue fundamental political, economic, and military reforms—and, in particular, abandon its singular preoccupation with the accumulation of military power—the Soviet economy would soon collapse under an intolerable military burden. Although there may be important differences in political philosophy among potential contenders to replace Mikhail Gorbachev, both comments and events suggest that this “objective” fact is accepted across the Soviet political spectrum. Although individual policies could be changed (reversed), the sum total could not return the Soviet Union to the track it left with the passing of the Brezhnevites.

Even assuming that such policy reversals are not likely, there is another concern—of equal importance—that the on-going policy reforms, if successful, could actually improve the Soviet military posture vis-à-vis the West. That is to say, they would give rise to a “leaner

and meaner" Soviet military superpower—one equipped with fewer but far more sophisticated and lethal weaponry—by the end of the 1990s. Of particular concern is the possibility that some package of economic reforms will result in a surge of technological innovation in Soviet defense sector, undermining the West's traditional technological advantage.

The case for the "threat" of accelerated technological innovation in Soviet military research and development (R&D) is, *prima facie*, a serious one. It is grounded in the rhetoric of perestroika and official Soviet policy statements, in the well-articulated hopes and expectations of the Soviet military establishment, and in some of the policy changes under way. Indeed, as is described in the next section of this paper, both economic-industrial and military policy forecasts create the expectation of significant increases in the pace of technological innovation in Soviet industry in general, and defense industries in particular over the next decade.

However, rhetoric, expectations, and individual policy changes notwithstanding, no such renaissance of Soviet military can take place. The cumulative effect of Soviet regime policies as implemented in the political, economic, social, and military spheres taken in conjunction with the political and social upheavals under way in Soviet society will depress the pace and breadth of technological innovation in defense sector R&D and bring little significant improvement in civilian sector R&D.

THE CASE FOR ACCELERATED TECHNOLOGICAL INNOVATION

The case for accelerated technological innovation in military R&D is based almost entirely on two sets of policy expectations. The first set represents the promises of economic perestroika as originally outlined by the Gorbachev regime from 1986-1987—what might be called perestroika-I. The second set of expectations is derived from the military leadership's original perception of the implications of both economic and military perestroika, and reinforced by the military's assumption that it would continue to be the primary beneficiary of any economic-industrial policy changes.

The Expectations of Economic Perestroika

The rhetoric of the Gorbachev regime's economic perestroika policies certainly held out the prospect of significant technological gains, all of which could ultimately benefit the defense sector. As originally conceived, perestroika-I envisioned:

- Pursuing a strategy of intensive growth by shifting investment priorities to industrial base renovation;
• Emphasizing the quality—performance and reliability—of output over quantity (and revising industrial performance indices accordingly);

• Restructuring organizational linkages among scientific research, experimental design, and production; and

• Joint ventures with foreign firms that would bring much needed capital and technological expertise from overseas.

The acceleration ("uskoreniye") of technological innovation was seen as both an engine and an outcome of perestroika-I.

Intensive growth via capital productivity gains were expected to come about as the result of massive new investments in the technological foundation of industry.² With an average capital stock turnover time of 20 years or more, the technological level of Soviet machinery—including defense industry machine tools—lagged significantly behind world standards. Not only was the production technology inefficient, but it also inhibited technological innovation in output products.

Accordingly, plowing new investment resources into the renovation of the industrial base was to be coupled with special emphasis on state-of-the-art producer technologies. Robotics, microelectronics, and computer technologies, computer-controlled machine tools, new materials, new production and fabrication process, and bio-technology were specifically mentioned.³ Meanwhile, substantial investments in national infrastructure—transportation, energy, and communications—were expected to have multiplying effects on industrial production, accelerating the output of high technology goods.

An Emphasis on Quality. Quality—loosely defined by the characteristics of high reliability, high performance, and world standards of technology—has taken a front seat in the rhetoric and program of economic and military perestroika. The 27th Party Congress (1986) and the 19th Party Conference (1988) enshrined the notion of quality in Soviet economic-industrial policy. A variety of new economic performance indices were proposed and tested, attempting to encourage product quality over raw output quantity.

The issue of quality become so central that a new state agency—GOSPRIYEMKA (the State Standards Agency)—was created to monitor and enforce quality standards in the civil

²Intensive growth via labor productivity gains were pursued by a combination of work force sobriety and leadership exhortation: a work force “dried out” through the anti-alcohol campaign was assumed to be more susceptible to extortions to work harder. Although a temporary surge in labor productivity did indeed occur, it was not of lasting significance.

sector. Presumably, GOSPRIYEMKA was expected to operate in a manner similar to that by which the military representatives (voyenpredi) were alleged to enforce quality control in the defense sector: rejecting unacceptable products on the production line. Most important from the standpoint of defense technologies, GOSPRIYEMKA representatives were placed to oversee facilities that accounted for one-third of the output of the machine-building sector.4

There is also some evidence suggesting that Gorbachev felt that the poor quality and low technological level of Soviet industrial products was very much an attitudinal problem. Consistent with other early perestroika efforts, leadership jawboning was considered to be an effective remedy.5 Leadership and press commentary strongly suggested that technological acceleration was expected to follow rapidly.

Restructuring Organizational Linkages. A traditional Soviet response to any policy problem has been administrative (organizational) remodeling, invariably involving the creation of ever-larger organizational structures that increase centralization of decision-making and authority. The drive to accelerate technological innovation and diffusion under perestroika—I was no exception. In early 1985 so-called interbranch science and technology complexes (MNTKs) were created, attempting to harness the scientific expertise of the Academy of Sciences in solving the practical problems of technological innovation in design.6

At the apex of MNTKs, Academy research institutes were put in charge of technology pyramids comprising other research institute and industrial experimental design bureaus. In particular, the hope was to shorten the time between “discovery” and application, which was growing incredibly long. At the same time, the MNTK structure was intended to make new inventions available to a wider array of customers.

More generally, military specialists on science and technology argued that the old structure of pursuing advanced technology programs—using ad hoc committees—was no longer productive. More often than not these committees impeded rather than fostered technological innovation. By implication, the “old boys” of the defense industry dominated these committees and slowed innovation for the sake of “producing” and earnings for their ministerial charges.

Decrying the poor state of the Ministry of Defense’s own research institutes and their poor—or nonexistent—links to other research institutes, military critics also pointed to the

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5See Gorbachev’s speech to the workers at Leninsk (Baykonur kosmodrome). Gorbachev (1987).
6A forerunner of the MNTK was the science-production association (NPO), introduced in the early 1970s. NPOs linked specific ministerial (as opposed to Academy) research institutes with design bureaus and production units.
"stronger" experimental base of the Academy of Sciences and production ministries and called for better coordination of research efforts and free flows of information.\(^7\)

In fact, in 1990 the Military Industrial Commission (VPK) created 20 regional centers for technology coordination among the research institute and experimental design bureau of the Ministry of Aviation, Ministry of Shipbuilding, and the Ministry of General Machine Building. These centers are expected to facilitate the flow of innovation information among the R&D establishments of these defense industry ministries—something that allegedly had not been possible before.\(^8\)

**Joint Ventures.** The tools of technological acceleration were also to be sought in foreign markets. Joint ventures between Soviet and foreign enterprises were expected to yield important dividends, including significant transfers of Western technology. Even enterprises in the Soviet defense sector—most notably the aviation industry—received permission to engage their Western counterparts in joint venture discussions.

In the wake of significant program cuts in 1989 and 1990, defense sector research institutes and design bureaus began to scurry for foreign partners.\(^9\) The Soviets offered their expertise, personnel, technology, and know-how in exchange for financing, access to markets in the West, and technology transfer. There were even suggestions by Soviet military-industrial officials that proposals for joint projects between U.S. and Soviet national (defense) laboratories would be considered favorably.

**The Expectations of Military Perestroika**

Whereas economic perestroika was supposed to establish the proper conditions within the defense R&D sector for providing the "supply" of technological innovation, military perestroika was supposed to accelerate the "demand" for technology within the armed forces. In fact Ministry of Defense rhetoric was already trumpeting the onset of a new scientific-technological revolution in military affairs by the beginning of the 1980s.\(^10\) The launching of military perestroika only reinforced existing expectations. If the Soviet Union was going to remain a superpower, the military leadership argued, it would have to compete on the basis of technology.

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\(^7\)Yusupov, Kalashnikov, and Shinkov (1988); Glazunov (1988).

\(^8\)Based on interviews with VPK, Gosplan, and Ministry of Defense officials in 1990.

\(^9\)Interviews with research institute and design bureau directors produced fairly consistent stories regarding losses of projects and program budgets of the order of 25 percent from 1988 levels. In most instances entire projects were scrapped rather than maintaining all programs with reduced funding.

The Ministry of Defense’s expectation that military R&D and weapons technology would surge ahead during the 1990s was fueled by three propositions:

- long-term trends in weapons technology as forecast by Soviet military science were creating a characteristically new threat that the Soviet leadership could not ignore;
- an emphasis on quality over quantity in the new military doctrine would create new opportunities and mechanisms for pursuing a vigorous military R&D effort; and
- current weapons procurement could be mortgaged to pay for future technological growth.

**Long-Term Trends in Weapons Technology and the Threat.** The Soviet military leadership has, for at least the last decade, been increasingly concerned about the potential for a new “military-technical revolution” rearing its head in the West.\(^{11}\) Soviet military writers forecast that the emerging generation of conventional weapons—integrating microelectronics, sensors, computers, new materials, and exotic kill mechanisms—would have lethally approaching those of nuclear weapons. There was also the specter of weapons based on new physical principles, such as lasers, particle beams, and the like. Weapons based in space—offensive spin-offs of U.S. SDI efforts—became a central concern of Soviet military technology specialists.

Reacting to these trends in Western weapons programs, Soviet military scientists forecast a clear and present danger to the foundation of Soviet military power built up over two decades of effort.\(^{12}\) Soviet weapons planners assumed that they would have to accelerate the rate of technological innovation in their own R&D just to keep pace with the West. (Indeed, the incredible demonstration of U.S. military technology that characterized the Persian Gulf War confirmed the worst fears of Soviet military leaders in this regard. Although the war was not in any sense a contest between U.S. and Soviet weapons, it was a powerful illustration of Western “technology fusion.”)

They also assumed that the political leadership would understand and agree with this assessment. Indeed, the new military doctrine as outlined by Gorbachev seemed to reinforce the expectation that resources would ultimately be forthcoming.

**Military Doctrine and Quality.** Strong support for shifting emphasis to new technology seemed implicit in the new Soviet military doctrine that was emerging in the late

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\(^{11}\) See, for example, Ogarkov (1982; 1984).

1980s. A key component of that doctrine, the concept of reasonable sufficiency, argued for quantitatively smaller but qualitatively better forces.

This explicit tradeoff between quality and quantity became official policy at the 19th Party Conference (1988), as subsequent articles in the military press made clear. In the initial aftermath of the conference military spokesmen tended to emphasize qualitative improvements through better troop and officer performance: stricter discipline, better training, higher proficiency, etc.

But as time passed, military discussions began to focus more consistently on the need for new technologies and more sophisticated weapons. At lower force levels, it was argued, new weapons had to have much greater capabilities than those in the past. For example, if the Air Force were going to be down-sized, then more sophisticated multi-role aircraft were needed to replace the large stocks of single-purpose aircraft in the inventory.

At the same time, the forced priorities implicit in reasonable sufficiency could be expected to lead to more efficient and effective use of Soviet high-technology R&D. The defense sector would be forced to abandon the old, wasteful, weapons acquisition methods and instead focus more intently on a limited set of defense technology goals. Although the scope of military R&D might contract, the more restrictive weapons procurement agenda would allow for a more effective concentration of research resources on “critical problems.” In theory, this focusing down would accelerate technological development.

The new doctrinal emphasis on quality also held out the prospect of reversing the military’s slipping influence over the weapons procurement process. Though it was not known in the West, the military had lost much of its clout over the defense industries during the tenure of Dmitri Ustinov as Minister of Defense. It was receiving what it perceived to be “inferior” equipment of low technological standards and dubious reliability. If the party and government were now going to back “quality,” this would mean the military would have to be given the authority to enforce higher standards and push for greater technological innovation.

Another aspect of the new military doctrine that, at least indirectly, suggests an improved environment for technological innovation is the explicit effort to reduce foreign perceptions of “the Soviet menace.” By significantly reducing the volume of the political-

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13For a discussion of the origins and content of the new military doctrine see Meyer (1988).
15This was almost certainly a reaction to sweeping budget and force cuts that were being proposed and implemented in 1989.
16Based on interviews with defense industry, military, and VPK officials in 1990. For revealing discussion of the “tyranny” of the defense industries, see Manushkin (1990), Meyer (1990), and Ishchenko (1989).
military confrontation between East and West and by "de-ideologizing" Soviet foreign policy, the expectation is that the Soviet Union would gain much greater access to Western technology.

And indeed it has. As the Soviet threat seemingly evaporated, COCOM restrictions are being eased and joint ventures involving substantial technology transfers are being discussed. In 1990 consideration was given to allowing U.S. West to construct a fiber optic cable communications system that would connect Moscow with the Far East.

Besides the obvious effects of vastly increasing data and voice communications rates, the system would also be secure from U.S. communications intercept efforts.

Last, the new "defensive" strategy that evolved during the late 1980s reinforces the demand for technologically sophisticated weapons as the missions of the Soviet armed forces are reviewed and revised. In order to blunt an offensive, the Soviet Union now requires some of the very same capabilities and technologies that the NATO countries had pursued to halt a Warsaw Pact attack. Even the "new thinkers" among Soviet academics joined the chorus advocating new high-technology weapons for the military to replace the traditional weapons that gave the Red Army its offensive potential.

**Mortgaging Weapons Procurement.** As the military leadership surveyed the defense sector infrastructure, however, it became readily apparent that the Soviet Union was not set to enter this new age of defense technologies. Before the Soviet Union could hope to develop and produce the next generation of weapons, the industrial base required an almost complete technological overhaul.

Thus, the Soviet military was quite receptive to the message of perestroika-I and the necessity of accepting a short-term mortgage (five years) on weapons procurement in exchange for investment in the industrial technology base. In essence, the tradeoff involved skipping a generation of some weapons systems now in order to develop the capacity to move several generations ahead later on.

**THE CASE AGAINST ACCELERATED TECHNOLOGICAL INNOVATION**

Where the case for accelerated technological innovation in Soviet military R&D is based on the expected effects of economic and military reform policies, the case against it follows from their actual impact on the R&D sector. The partial and inconsistent implementation of the economic reforms has created pressures in the R&D sector that slow the rate of innovation and restrict the breadth and scope of research and development.
Correspondingly, the new military policies have had the unintended effect of undermining the armed force's ability to absorb high technology, in contradiction to military expectations and rhetoric.

There are, moreover, a larger set of political and social developments that, taken in conjunction with economic and military reforms, create an unfavorable near and mid-term environment for technological innovation and absorption. This broader policy environment makes it unlikely that isolated policy reversals would result in rapid improvement in the Soviet military R&D picture.

The Realities of Economic Perestroika

The realities of economic perestroika that have directly harmed the defense R&D sector include:

- the failure to carry out an investment policy aimed at renovating the industrial infrastructure;
- the negative effects of self-financing and cost-accounting;
- the rapid rise of weapons systems unit costs;
- the poorly conceived and implemented program of defense industry conversion;
- the failure of organizational and administrative reforms—GOSPRIEMKA and MNTKs; and
- the failure of joint-ventures to materialize.

Failure to Renovate the Industrial Infrastructure. First and foremost, plans for technological "uskoreniye" were not realized because the program of expanded investment in industrial infrastructure and renovation, as originally conceived, was never implemented. And subsequently, investment policy has made several about-faces, all of which have destroyed any hope of serious ministerial and enterprise capital planning.

The original investment goals of the 12th Five Year Plan were not realistic. Fiscal resources were not sufficient to meet the task at hand. To the extent that additional investment resources were expected to be made available by cutting weapons procurement, the amounts were still far too small to meet the need. Based on the history of the huge investment sums squandered during 10th and 11th Five Year Plans—all without any noticeable acceleration of technology—it is hard to understand what Soviet economic planners were thinking when they devised the 12th Five Year Plan.

In any case, whatever marginal positive effect sustained infrastructure investment may have had will never be known, because some time in 1988 a political decision was made to shift direction and use investment resources to improve the consumer goods production
base. Apparently, Gorbachev and his reform-minded advisors believed that levels of social dissatisfaction across the country were rising to the point of threatening social revolution, unless major efforts were made to satisfy consumer demand.\(^\text{17}\) Thus the technological rhetoric of perestroika was abandoned and emphasis was placed on manufacturing lines to produce frying pans, toaster ovens, and yogurt processors, not robotic machine tools, microchip etching machines, or CAD-CAM systems.

By 1991, however, Gorbachev had again changed his economic management team and the new government of Prime Minister Pavlov was talking about shifting back to a strategy of investment in high-technology industrial infrastructure. Unfortunately, too much has happened since the term “uskoreniye” was first inserted into Gorbachev’s speeches in the mid 1980s. The economy is in absolute decline. The government faces an acute deficit crisis. Partial economic reforms have destroyed the parts of the system that worked. And the country is now engulfed in a political crisis that preoccupies all levels of the system. At this point it is doubtful that available investment resources can maintain the industrial base in good repair—let alone raise its technological level.

In short, the much discussed investment in high technology has not happened and will not happen.

Cost-Accounting and Self-Financing. These mechanisms were first introduced into the R&D sector in 1987 in the hope of improving efficiency and performance. Basically, research institutes and experimental design bureaus were told that they would no longer receive subsidies from the central government. Instead R&D establishments were expected to cover completely their organizations’ wage and operating expenses by making sure that their project work was fully costed and fully paid by the customer.

It was expected that these reforms would make the defense sector more efficient, more quality-oriented, and more productive. What has actually happened, however, is that:

- considerable uncertainty has been introduced into R&D planning;
- price inflation is reaching unprecedented levels;
- there are additional incentives to avoid technological risky work and instead focus on projects that can be completed quickly;
- there are strong incentives for research institutes to avoid basic research in favor of applied projects.

\(^{17}\)This view was forcefully related in conversations with senior Soviet military, GOSPLAN, and VPK officials and economists in interview during 1989 and 1990.
The self-financing and cost-accounting reforms assumed that contractual agreements with Ministry of Defense armaments directorates, defense industry producers, and anyone else interested in R&D products would eventually replace the old system of indirect agreements among ministries. Thus, by 1990 defense-related state orders and support subsidies had been scaled back to the point where they no longer covered research institute/experimental design bureau wage funds, not to mention capital and instrumentation expenses. Yet no research institutes or design bureaus were successful in garnering enough contract work to cover the losses. This was due in part to organizational resistance to the reforms and in part to the lack of any mechanisms for linking R&D suppliers with potential clients. In any case, by the end of 1990 defense R&D facilities associated with nuclear weapons, aircraft, and missile development reported suffering project cancellations equivalent to 25 to 33 percent of their wage and operating funds.  

This, of course, gave new impetus to the research institutes and experimental design bureaus to search for contract clients—civilian as well as military. The new clients, however, are uninterested in supporting long-term R&D projects. Their needs are immediate and revolve around one-shot products. This activity was quite alien to the Soviet defense R&D community. It breaks with long-established patterns in military research and development that enabled projects to persist for decades. The resulting uncertainty has unravelled R&D planning at the institute and bureau level; projects are being delayed or are going uncompleted.

Because self-financing and contract relationships were intended to put R&D establishments on an unsubsidized footing—meaning that prices for R&D services must be strictly related to costs—it is obvious that R&D prices had to rise, and they did. Because no pricing guidelines were provided to the research institutes and experimental design bureaus, they were left to their own devices to establish prices. Old habits die hard and in the wake of cutbacks in subsidies, research institute and experimental design bureau managers refused to lay off staff as a cost control measure. Instead, they simply raised prices to cover...

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18 According to Colonel-General Babayev, Head of the Finance Directorate of the Ministry of Defense, overall spending on nuclear warhead development has been cut about 43 percent in 1990. See Kuzer (1990). Confirmation of R&D cutbacks on the order of 25 percent comes from interviews with nuclear weapons laboratory directors. See also Falichev (1990).


20 Deput Minister of Defense Acalov reports that R&D projects have been delayed 3 to 6 years. Others are on indefinite hold. See his interview with Vegerov (1990). Nuclear weapons laboratories are also feeling the pinch: see Falichev (1990).

21 Karasev (1988) discusses some of the confusion over R&D pricing policy.
their full overhead. The result has been price inflation of a factor of 1.5 to 3 on R&D projects.\textsuperscript{22}

Such huge price increases have stifled customer demand; monies allocated to the Ministry of Defense for contracting R&D have been declining steadily since 1987. Moreover, these price increases are for current technology programs, not the "new" technologies endeavors implied by the shift to quality that is so prevalent in military rhetoric today.

At the same time, self-financing and cost accounting have generated pressures for research institute and experimental design bureau to avoid risky, long-gestation, high technology R&D projects. The new emphasis on self-financing means that R&D establishments must be concerned with fulfilling contracts to the satisfaction of their customers. But their customer base is, presumably, growing more diverse. Now research institutes and experimental design bureaus are subject to divided loyalties between state-ordered defense contracts and solicited defense and civilian contracts. Failure to perform satisfactorily on any major project can now result in a serious shortfall in funding. Therefore there are very strong incentives to avoid long-term risky projects, and instead pursue "doable" safe projects where the pace of innovation is low but likelihood of delivery is high. In other words, self-financing reinforces preexisting proclivities toward incremental innovation in defense products, not leaps of innovation.

Moreover, as described below, whereas the defense orders nominally involve high-technology military items, the civilian contracts acquired by research institutes and experimental design bureaus to cover expenses involve low-technology systems. With this kind of split effort there is no reason to expect a net acceleration of defense technology innovation; in fact, the "diversion" of R&D teams to low technology development will tend to drag down innovation rates in defense.

One might think there would be strong pressures from potential research institute customers (design bureaus and production enterprises) for research institutes to "market" high-technology research. But a similar mixture of incentives and disincentives inhibit them from pursuing risky high-technology projects as well. They too are operating under newly imposed cost accounting and self-financing rules that generate great pressures to deliver on their contracts. Experimental design bureaus and production enterprises have no interest in getting "hung up" on problematic design tasks.

Here again many of the self-financing contracts will involve low technology civil products. For instance, some nuclear weapons design teams are now working part time

\textsuperscript{22}Shabanov (1989).
designing dairy processing equipment.\textsuperscript{23} Aviation design teams are working on jam processing, pasta-making production lines, cabbage seeding machines, and assembly lines for packaging dried fruit.\textsuperscript{24} Thus, experimental design bureau talents are being spread thinly over high and low technology programs, diluting innovation potential.

Because the design bureaus are also responsible for designing the serial production facilities associated with the product, they must be very sensitive to producer wishes. And here the production enterprises have no incentives to request risky designs that require high technology. In fact, the forces operating at the plant level run the opposite way: They have every reason to keep levels of innovation low because plant renovation means long downtimes and material and component supply is more uncertain than ever. Indeed, self-financing has created even greater uncertainties in the supply chain. Thus, the research institutes have few if any incentives to pursue high technology research agendas and many disincentives not to; design bureaus have no incentives to push research institute to state-of-the-art solutions, and production enterprises have no incentives to push experimental design bureaus to develop high technology designs.

Last, there is the thorny issue of “basic research”—fundamental science that has no immediate practical implications—and long-term development research where payoffs may be many a decade away. Who will pay for this work?\textsuperscript{25} Under the new economic structure there will almost certainly be a contraction in basic and long-term research because there will be few incentives for potential contract clients to support this work. It is interesting to note that the Academy of Sciences—a logical place for basic research to continue to flourish—is feeling precisely the same pressures as the defense R&D establishment. Self-financing and cost accounting are pushing Academy institutes to look for applied, near-term payoff, projects.

**Weapons System Unit Costs.** In a similar vein, Soviet authorities claim that over the next several years prices paid for military hardware will be raised to reflect their true costs. This will be necessary, of course, if defense plants are going to operate on self-financing

\textsuperscript{23} See the interview with former Minister of Medium Machine Building L. Ryabev in Verob'ev (1989).

\textsuperscript{24} Lagovskiy (1990) and Mikhailov (1990).

\textsuperscript{25} This was one of the first questions raised by the research establishment when self-financing was first proposed for research institutes. See Yurkov and Spirinchenko (1988), Karasev (1988).
and cost accounting without subsidies. Indeed, we already see clear signs of price inflation in weapons procurement.\textsuperscript{26}

Two effects will hinder technological innovation. First, procurement will compete directly with R&D programs for funds in ways that were not true in the past because unsubsidized rubles will be used for both. Second, weaponry based on new technologies, introduced under the new pricing scheme, will undoubtedly seem incredibly over-priced compared to current systems. This will almost certainly chill the military's ardent for new technology systems.\textsuperscript{27}

\textbf{Conversion.} Compounding the problems spawned by self-financing and cost accounting is the on-going "conversion"—in actuality, diversification—of the Soviet defense sector to expanded production of civilian goods. Research institutes, experimental design bureaus, and production enterprises are being assigned projects to support the production of consumer goods and associated process technologies (e.g., food processing).

In almost all cases these conversion projects dilute the focus of R&D establishments; they do not add to their innovative power. They have little or nothing to do with the specialty of the establishment beyond the most superficial association. As already noted, the overwhelming majority of consumer and light industry products that constitute the diversified output of the defense sector are basically low-technology systems: refrigerators, bicycles, jam-making machines. The associated R&D services and production skills are fairly mundane in nature and certainly not state-of-the-art—even Soviet state-of-the-art. Thus, there is actually a regression in defense sector technological development, not an acceleration of innovation.

At the same time, the labor required by these civil conversion projects taxes the capacity of research institutes and design bureaus. This is because there is simply no documentation for the civil items they are being asked to develop. Tremendous amounts of time and talent is being spent to reinvent the wheel.

As a consequence, a small but growing number of the most highly skilled personnel are leaving the defense sector—research institute, experimental design bureaus, and production enterprises—to enter the more interesting and lucrative cooperative movement.\textsuperscript{28}

\textsuperscript{26}Urban (1990) reports on GOSPLAN and Ministry of Finance notifications that prices for many major pieces of military equipment will increase by 50 to 100 percent. See Manushkin (1990a) interview with Deputy Chief of Staff of the Air Force Poznyakov.

\textsuperscript{27}Incredibly, the Soviet military leadership believes that high technology weapons will ultimately be less expensive than current technology weapons. See Moiseyev (1990).

\textsuperscript{28}See Savelyev (1990). Soviet sources claim that defense industries have lost 500,000 skilled workers. See Glushchenko (1990).
are choosing to leave the country altogether to seek jobs in the West. Needless to say, those with the greatest prospect of settling in the West are also among the most talented.\textsuperscript{29} Although the current exodus appears limited, it has been sufficient to worry Soviet industrial officials.\textsuperscript{30}

**Failure of Organizational/Administrative Reforms.** Both of the administrative-organizational fixes—GOSPRIYEMKA and MNTKs—have failed to produce any measurable acceleration of technology. Ironically, the ultimate failure of GOSPRIYEMKA is testimony to its success. Tasked with discovering and rooting out inferior quality products, GOSPRIYEMKA found that inferior quality was the hallmark of Soviet industry. It did its job too well, and political and economic pressures forced its emasculation; poor output was deemed better than none.

The failure of MNTKs to work their magic is many-faceted. In essence, few if any real mechanisms were created to stimulate the flow of technological information. A few formal links between Academy research institute and industrial design and production facilities did not add appreciably to the system's ability to innovate.

**The Failure of Joint-Ventures.** There are many reasons Soviet attempts to reap a technological and financial harvest from joint ventures have failed. The basic problem is that potential investors cannot find a convenient or practical way to extract profits from a country that lacks a convertible currency. The prospects of escalating social, political, and economic turmoil have further dampened the interest of foreign firms.

The effect of this policy failure is clear: Neither capital nor technology is flowing into the Soviet Union in anything near the volume needed to make a difference. Given the political and economic environment in the country, the prognosis for joint ventures over the next decade is dismal.

**The Realities of Military Perestroika**

As in the case of economic perestroika, the gulf between expectations and reality in military perestroika is wide and seemingly unbridgeable. The realities of military perestroika include:

- cuts in military R&D allocations;

\textsuperscript{29}Razuvalov (1990).

\textsuperscript{30}See Pravda (1990). Still other officials are worried by the more general prospect of Soviet scientific talent fleeing the country for the West. See the interview with Academician and Presidential Council member Yury Osipyan in Yevseyev (1990).
a military doctrine that fails to provide either guidance or resources for improving quality;

• personnel losses among the most talented and educated officers and conscripts; and

• a high command that lacks the ability to set a new direction for the military establishment.

**Cuts in 1990 Military R&D Allocations.** The military R&D budget for 1990 was ordered slashed by over 14 percent from 1989 levels over the vociferous objections of defense sector representatives and the military.\(^{32}\) Although one can certainly argue with the validity of the figures offered by Soviet authorities for R&D expenditures, the hand-wringing of those most closely associated with military R&D suggests that the sums withheld were not trivial.

Soviet military officials claim that as a result several dozen development programs were slashed, or pushed back into the research phase.\(^{32}\) A number of high-technology programs—including SDI-type efforts—were cancelled. All the armed services have been affected.\(^{33}\)

Unlike U.S. defense firms, the R&D outfits in the USSR are separate entities from the weapons producers. This means that R&D costs are neither folded into the procurement cost of a weapons system nor included in the overhead or profits of weapons producers (what we call independent research and development).\(^{34}\) Thus, R&D cannot be insulated from direct cutbacks in centrally allocated defense R&D funding.

**Doctrinal Requirements.** Despite contemporary rhetoric, the emphasis on high-technology and quality in Soviet military policy is anything but new. One need only glance through the pages of Sokolovskiy's *Military Strategy* or available issues of the restricted journal *Voyennaya mysl'* to see that the specter of military technical revolutions has haunted Soviet military theorists for decades.

When Brezhnev addressed the Main Military Council in 1982, he gave them a simple message: *no new resources, make better use of what you already have.* In particular, he suggested improving the qualitative and technological parameters of military equipment.\(^{35}\) Thus, the recent surge in official exhortations to higher quality and technology does not

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\(^{31}\)Shabanov (1989).

\(^{32}\)Interviews with Ministry of Defense and VPK officials. According to Alekseyev (1990) some 60 research programs and 100 development programs have been cancelled.

\(^{33}\)For a discussion of naval R&D problems see Belyshev (1990).

\(^{34}\)Manushkin (1990).

\(^{35}\)Brezhnev (1982).
signal a shift in military policy, it is the only reasonable reaction to decreasing quantity of arms.

In fact, the Soviet Union has never had a military doctrine of technological mediocrity. The military leadership has not purposely depressed the technological quality of weaponry just to procure large quantities. Rather it has acquired the greatest quantity of weapons with the highest technical characteristics that the defense industries were willing to provide. Where technology was lacking, the military made do with what it was given.

Given the realities of economic perestroika, there is no reason to expect that the defense industries will be able to do any better. Indeed, their performance may actually decline in absolute terms.

So how do we interpret the charge of the 19th Party Conference emphasizing qualitative development of the armed forces? When read in the context of other aspects of the new military policy, it is quite clear that for Soviet political leaders the exhortation to quality is in reality a euphemism for reduced quantities! It is not a promise of higher technology weapons to replace declining weapons acquisition; it was an admonition to make better use of the declining resources that would be made available. Political leadership references to weapons quality revolve around reliability and longevity, not tactical-technical (combat) characteristics.

Indeed, by late 1988 it was clear to the military leadership that the perestroika program they had signed onto in 1986 was not the one that they now confronted. What was originally perceived to be a short-term mortgage (five years) on military procurement had blossomed into a national program of conversion that was of indeterminant length. At best the “short-term” mortgage now means 15 to 20 years, far beyond the service tenure of today’s colonels and generals.

Thus, we find the military leadership taking every opportunity to point out the dangers of continuing this policy course. For instance, Minister of Defense Yazov warns about false hopes of reinvigorating the economy on the back of the armed forces and calls for “reasonable conversion.”

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36 And when Soviet defense industries were unable to match foreign technology, the Military Industrial Commission attempted to acquire it illegally. See U.S. Government (1985).
37 See the letter from top defense industrial officials: Pravda (1990).
38 Indeed, the fundamental notion of reasonable sufficiency itself is merely a strategy for saying “nyet” to new weapons development programs. Reasonable sufficiency is not a force-planning methodology or a calculus for weapons acquisition. It is a political hurdle for weapons programs.
**Personnel Problems.** If the armed forces are going to use high technology equipment, then they will need soldiers and officers capable of operating these weapons. However, current political and economic trends in the Soviet Union are reducing the prospects that the military will be able to retain the highly skilled and motivated cadre it would require, let alone attract new personnel of high quality.

The first blow occurred in 1989 when the Supreme Soviet passed a law deferring students in higher education from military service. Moreover, students who completed several military training courses in school were authorized to skip service and go directly into the reserves upon graduation. The student deferment law has cut off the pool of educated conscripts from the service and has made the assimilation and operation of technologically advanced weaponry more problematic.

This policy has already created serious difficulties for the Soviet armed forces in performing their missions with today's weapons technologies. For example, the Strategic Rocket Forces ICBM silos had been staffed until recently in three 8-hour shifts. Due to a shortage of educated personnel they are now staffed in two 12-hour shifts.

The number of accident-related deaths attributed to improper use of advanced equipment has risen dramatically this past year and is directly attributed to the student deferments and the consequent declining ability of troops to use sophisticated equipment. All the services have experienced a surge in accidents related to improper use of modern combat technology.\(^4\)

At the same time, consideration is being given to shortening the term of conscription service. There is some talk of cutting it to 18 months for all services.\(^4\) This has sent chills down the spines of the Navy command, who argue that three years is the bare minimum term required to master existing naval technology. It is likely that shortened terms would also endanger the technical proficiency of troops in all the other services as well.

Compounding this problem is the fact that the number of Russian-speaking conscripts is actually declining by about 5 percent annually. At present, some 10-30 percent of the soldiers in company-sized units cannot speak Russian.\(^4\) When the problems of education, language, and draft period are taken together, it suggests that military readiness and

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\(^4\)See the interview with Deputy Chief of the Strategic Rocket Forces General I. Sergeyev, in Teplyakov (1990).

\(^4\)Presently, conscription terms are 2 years for the Strategic Rocket Forces, Ground Forces, Air Forces, and Air Defense Forces. Naval conscripts must serve 3 years.

\(^4\)See Borodin (1990) and Teplyakov (1990).
capabilities will not be enhanced by a rush to increase the technological sophistication of weapons in service.43

Perhaps more important than problems in the conscript force is the general turmoil that now characterizes the Soviet officer corps.44 Over the past year, almost every article in the Soviet military press has been concerned with officer living conditions, social status, morale, motivation, prestige, discipline, quality, etc., dwarfing more traditional topics such as the military threat, battle tactics, and new weapons technologies.

It is the officer corps of the Soviet armed forces that would be the backbone of a high technology army.45 And it is precisely the kind of officer needed to handle high technology weapons who wants to get out of uniform. When the Ministry of Defense let it be known that officers could apply for demobilization as part of Gorbachev’s unilateral cuts, it was the young technical specialists who raced to get on the list.46 The poorly educated and unskilled preferred service life.

As a consequence of poor living and working conditions, nationalist agitation, and the general political and social upheaval in the country, applicants to officer schools are down significantly. From the perspective of the users of weaponry, the near- and medium-term prospects for a qualitatively improved Soviet military look worse than ever.47

Last, the Soviet military leadership today—most notably Marshal Yazov (Minister of Defense) and General Moiseyev (Chief of the General Staff)—is not composed of creative strategic thinkers or military visionaries (in contrast, say, to Marshals Sokolovsky and Ogarkov). They are not the kind of leaders who could chart a path for the armed forces into a high technology future, nor do they appear to have the intellectual foundation to do battle with other institutional powers in the Soviet system.

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43This raises the possibility of the Soviet Union switching to an all professional army. In order to offer wages competitive with the general economy officer salaries (lieutenant to major) would have to be increased by 300 percent. See Yermakov (1990). At the same time, strong anti-military attitudes among Soviet youth would have to be overcome before the “right” candidates were attracted. In a sense, the situation is analogous to that which faced the United States at the end of the Vietnam War.


45The lack of qualified noncommissioned officers places the burden of operating and maintaining weapons systems on Soviet officers.


47See Kislov (1980) and Solomontsev et al. (1990).
Rather, they are administrative station keepers; they are attempting to retain whatever is possible of the military's perquisites. There is no reason to expect that a grand strategic technology plan will emerge from this Ministry of Defense.\textsuperscript{48}

**The Realities of the Broader Policy Environment**

The broader policy environment is defined by the general political and economic turmoil that now characterizes the Soviet Union. The military has not been insulated from this turmoil, nor have the defense industries.

**Loss of Eastern Europe.** A conversion of a different kind is the fundamental loss of Eastern Europe as a secure military technology base supporting Soviet defense industries. There can be no doubt that the former communist countries of the Warsaw Pact filled important, specialized, niches in Soviet military R\&D. Although the Soviet Union will be free to purchase optics and electronics from its former socialist allies, this will not be in any way equivalent to the special relationships that existed previously (including technology security). Moreover, it is likely that the Eastern European producers will require hard currency payments—something that will strain the already overextended Soviet hard currency budget.

**Economic Turmoil.** The stuttering movement toward political and economic reform has destroyed many of the old mechanisms that allowed the scientific-engineering and industrial sectors to function but failed to produce anything workable to replace them. For example, the old five-year planning process has been effectively destroyed. Union-level reforms have greatly weakened the center’s ability to translate economic decisions into programs. Growing political power at the republic level has had a similar effect.

Not surprising, medium- and long-term R\&D planning has correspondingly been affected. Without the overarching structure of the economic and defense five-year plans, no systematic or long-perspective planning is possible. Indeed, General Moiseyev himself has said that the long-term planning process—as it applies to military planning—has been wrecked. Moreover, the self-financing reforms create powerful incentives for research institutes to ignore central direction.

The breakdown of the Soviet economy has resulted in the drastic cutback of food and consumer goods deliveries to many R\&D establishments. Significant numbers of R\&D

\textsuperscript{48}Undoubtedly there are some especially sharp officers waiting in the wings. It is not at all clear, however, that military or technical brilliance will be the criteria for selecting future members of the high command.
personnel have been "released" to scavenging missions to find goods and foodstuffs to support their facility staffs and families.

Not only does this result in lost work hours but it must inevitably destroy morale among what was once an elite work force. Lacking the basic necessities—let alone the fringe benefits they once had—R&D specialists are leaving the defense establishments and moving to cooperative ventures.49

Glasnost and Anti-Military Politics. On a larger societal and political scale, the growing manifestation of anti-military politics bodes ill for any major effort to accelerate military technology. In particular, there is a widespread sense that the military is largely responsible for the economic problems of the Soviet Union; the defense sector is accused of consuming, with great waste and inefficiency, the limited supply of high technology and precious resources available.

There is extensive questioning of all major military projects in the legislative bodies and in the press. This atmosphere suggests that prudent military planners are likely to pursue less risky weapons programs—programs sporting higher reliabilities and lower costs but involving safe technologies.

For years U.S. defense officials have envied their Soviet counterparts' freedom from public environmental restraints. Environment impact issues stifle many large U.S. projects, while the Soviet military erects monster structures all around the country. This is no longer the case. Local and regional environmental actions around the Soviet Union are on the rise, and the Ministry of Defense is in retreat.

In the last year, a missile-warning radar and several major air defense radar installations have been closed. More significant, residents near the Semi-Palitsinsk nuclear test range—the Soviet's main test facility—recently forced a pledge to close the range by 1993, and testing there has already stopped. Soviet nuclear testing is expected to move to Novaya Zemlya in the Arctic, but Russian environmental groups are already mobilizing to stop testing there. Even if testing continues in the Arctic the shift to a very inhospitable location will certainly impede R&D of advanced nuclear systems.

The Loss of Influence of the Communist Party. At both the regional and national levels the Communist Party is a declining influence. Although Party functionaries continue to hobble reform, they have little ability to make things happen. Yet, studies have shown

49 In fact, the problems discussed here pertain to the broader realm of Soviet science, not just defense research. See Saltikov (1990).
that Communist Party bureaucrats have been an essential element in the grease that has kept the defense sector wheels spinning.

Without the Party's ability to intervene on behalf of the defense sector clients, the priority structure that has allowed Soviet military technology to rival that of the West will be significantly weakened. Civil industrial demand will have one less political obstacle in its competition for resources.

The Party will also not be much assistance in resolving disputes between the armed forces and the defense industries. This is particularly noteworthy at a time when there is strong and open institutional warfare between the Ministry of Defense and the defense industries.\footnote{See Meyer (1990). The intensification of this institutional battle is a direct consequence of declining resources.} In particular, the military claims that for at least the last decade it has been forced to submit to the "tyranny" of the defense industries. The latter is alleged to have dictated both the quantity and quality of weaponry delivered to the Ministry of Defense, resulting in great waste and inefficiency. As a consequence, the Ministry of Defense and its subordinate services are attempting to acquire powerful new authority over defense industrial contracting. Ironically, the self-financing reforms may help in this regard.\footnote{If, and only if, the Ministry of Defense can gain direct control over R&D and procurement funding.}

In any case, without the Party's ability to impose decisions, the squabbling between the defense sector and the military can serve only to hurt the coherence, efficiency, and effectiveness of Soviet military R&D.

CONCLUSION

Soviet military R&D is entering a new age, but it is not the one envisioned by the rhetoric of perestroika or the wistful hopes of Soviet military writers. Political, economic, and social forces seem to be allied in depressing technological innovation. On the "supply side" of the technological equation, the Soviet defense R&D sector is hobbled by a host of institutional and structural constraints. On the "demand side" of the technological equation, the armed forces are retrogressing—becoming less capable of handling high technology systems.

It is not obvious how the reversal of any single policy, or set of policies, could do much to alter these trends in the near-term. Their effects are synergistic and multiplicative rather than additive.
To be sure, Soviet policymakers could tinker with the details of existing policies to ameliorate some of their "dysfunctional" aspects. For example, all funds for military R&D could be allocated to the Ministry of Defense. (Currently, the Ministry of Defense controls only a small fraction of funds that are eventually dispensed for defense R&D.) Through the power of contracting, the Ministry could then attempt to rationalize and focus R&D programs. This would weaken the independence of the defense industrial R&D sector and make it more responsive to military-strategic and tactical-technical priorities.

But individual policy changes, no matter how dramatic, cannot alter appreciably the more fundamental forces acting to slow the scope and pace of technological innovation in Soviet military R&D. These are endemic to the political and economic transformation of the Soviet Union. And it is clear that the Soviet government has been unable to insulate the defense industrial sector from these forces.

Thus, it is hard to imagine how any significant acceleration of technological innovation can occur before the political and economic future of the Soviet Union has been decided and the country has begun to move down that path in a systematic way. Although it is certainly possible that some notable singular technological achievements may emerge from the Soviet military R&D establishment, over the next decade the systemic level of technological innovation will stagnate.
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5. THE EFFECTS OF PERESTROIKA ON THE DEFENSE SECTOR AND RESOURCE ALLOCATION IN THE USSR

James Noren

INTRODUCTION

It is already evident that Mikhail Gorbachev’s perestroika has had profound consequences—intended and unintended—for the Soviet defense sector and for resource allocation generally in the USSR. In this paper I shall be dealing primarily with the effects of Gorbachev’s programs on the military forces and defense industry. Because there is a lot of ground to cover, some topics will receive relatively short shrift. In particular, I will not report on the progress of the conversion of defense industry to civil production or the effects of perestroika on foreign trade and militarily important technology transfer because these questions are the subjects of other papers to be given at this conference.

The approach taken in this paper is to consider perestroika’s impact on the defense sector in terms of a succession of stages. In the initial stage, Soviet defense programs and policies were relatively untouched although the seeds of change had been sprouting for some time. A second stage saw increased questioning of the performance of the defense sector, a debate over how much defense was enough, and decisions in the arms control arena. The stage in which the USSR finds itself now took shape in 1988 as economic restructuring fizzled and the leadership decided to abandon its original strategy for the 1986-90 Plan. Finally, I will discuss briefly the outlook for defense policy and programs in light of the changes already unleashed in society and the economy.

THE DEFENSE SECTOR IN 1985 AND 1986

On the whole, the Soviet defense sector was fairly well protected in the first two years of Gorbachev’s tenure as General Secretary. Soviet military programs fared better than defense industry, but both elements benefited from the constraints imposed by planning schedules, heightened fears of military confrontation or shifts in the military balance, and Gorbachev’s hubris.

Programs, Spending, and Investment

Soviet military modernization proceeded with renewed momentum in 1985-1986. The year 1985 saw a spurt in aircraft production with beginning production of the BLACKJACK
bomber and rising output of fighter production. Following a slump in the early 1980s, procurement of both tactical and strategic missiles continued to climb.1

After leveling off in the early 1980s, real defense spending also began to rise in 1984-85 at the rate of about three percent per year.2 Outlays for procurement turned upward although rising outlays for operations and maintenance and research and development also played an important role in the overall growth of defense spending.

Even from his early days in power, however, Gorbachev began to reassert civilian control over the defense sector. In July 1985 he confronted his military leaders in a meeting at Minsk. There he reportedly told them that the defense sector would have to share in the sacrifices for perestroika and would be held to a higher standard of stewardship for its use of the nation's resources.3 In October 1985, a party program was presented—the first revision of the program since Khrushchev's in 1961. The new program stressed the party's role in formulating military doctrine, a provision absent in the 1961 revision.4 The industrial modernization campaign also impinged on the defense sector by placing greater demands on it and by reducing the share of new fixed investment allocated to defense production facilities. By the early 1980s, Soviet leaders began to recognize that defense industry's base of support in civil industry had eroded, threatening the USSR's ability to keep up in the military-technological competition with NATO.5

In the 1981-85 plan, civil machine building was given a larger share of overall machine-building investment.

When Gorbachev made industrial modernization a cornerstone of his program for renewing the economy, the ambitious targets for increasing output of high-technology machinery as well as other machinery for investment were directed at both civil and military machine building because, according to Soviet statements, the share of civilian output in the production of the (then) nine military machine-building ministries was 40 percent. Moreover, the share of machine-building investment going to civil machine-building was raised even though military machine building was called upon to increase greatly its production of computers, electronics,

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1Gorbachev's Modernization Program: A Status Report," a paper presented by the Central Intelligence Agency and the Defense Intelligence Agency for submission to the Subcommittee on National Security Economics of the Joint Economic Committee, Congress of the United States, DIA-DDB-1900-140-87, August 1987, p. 9. (Hereafter, this series of reports will be cited as CIA/DIA Report to the JEC.)

2These CIA estimates are compiled in 1982 prices.


and communications equipment. From the beginning of the five-year plan, it was clear that Soviet plans for machine building were far too optimistic and that the goals for civil production would inevitably conflict with those for military production.6

**Reasons for the Upswing in Military Spending**

In March 1985 preparations for the 1986-90 Plan were already at an advanced stage. Because the five-year defense plan is generally considered before the assignments for the rest of the economy are nailed down, the plans for military force development and military production probably already had been approved. Moreover, these plans reflected the inertia provided by a great many past decisions on weapons development and force requirements. For Gorbachev to have intervened at this point—even if he had wanted to—would have been difficult both from the standpoint of unraveling the planning schedule and from its potential effect on his political position. He had been selected as General Secretary with the support of the military and defense-inclined Politburo members. In consolidating his position, the defense spending issue was not one to raise in his first year of office.

The temper of the times also favored Gorbachev's approving (or permitting) an acceleration in defense spending. By the end of 1984, U.S. defense outlays had increased by 36 percent in real terms from their 1978 level, and the projections of their future growth were at the very least on the robust side. Meanwhile, Soviet real defense spending had grown by an estimated 11 percent in real terms. In the early 1980s, military criticism of Brezhnev's defense policy had become open and insistent. Marshal and Chief of the General Staff Nikolay Ogarkov, for example, suggested that Soviet leaders were not reacting properly to the U.S. build-up. According to Dale Herspring, Ogarkov “questioned the utility of detente and arms control arrangements with the United States and argued, especially toward the end of his tenure (September 1984), for greater budgetary allocations to the military.”7 Indeed, during the early 1980s, Oleg Gordievsky, the former KGB station chief in London, claims that those in Moscow who believed that the West would start a war and use nuclear arms constituted a “majority of the political and military leadership of the USSR.”8

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8Interview in the *London Times*, February 27, 1980.
The increasing acceptance within the military of the possibility of a prolonged conventional war combined with a growing recognition of the qualitative factor in weapons procurement and force readiness gave additional support to the proponents of more rapid growth in military spending. Soviet military leaders looked at developments in NATO and worried that the Soviet Union was falling behind in developing and fielding new precision-guided conventional weapons as well as strategic weapons based on new physical principles. The U.S. Strategic Defense Initiative only served to elevate their concern. A response to U.S. programs, a greater emphasis on conventional forces, and pursuit of high-tech weaponry all pointed to higher military spending—if they could obtain the leadership's approval.

With the benefit of hindsight, one can conclude that the leadership had decided to give defense higher priority in 1983-84, when the 1986-90 Defense Plan was evolving. In November 1982, General Secretary Yuriy Andropov addressed a Central Committee Plenum and discussed national priorities. The tilt toward consumer welfare and civilian programs was then noticeable. By the spring of 1984, however, General Secretary Konstantin Chernenko could say that "the complex international situation has forced us to divert a great deal of resources to... strengthening the security of our country. But we have not permitted a curtailment of social programs." The target for military spending in the 1986-90 plan remained a mystery, however, until recently. In June 1989, Premier Nikolay Ryzhkov revealed that:

When forming the plans for 1986-90 because of the international situation prevailing at the time and our military doctrine, we were compelled to envision a traditional growth of defense expenses at a pace exceeding the growth of national income.

This would have had defense spending growing by at least 4.5 percent per year. In April 1990, however, Gorbachev declared that the planned rate of growth of defense spending in 1986-90 was almost 8 percent per year. In a speech at Nizhniy Tagil, he said;

Until recently you and I, dear comrades, lived like this. For instance in the 11th five-year plan, and even still in the 12th, but in the 11th too, what kind of ratio did we have? The national income was to grow by some 21-22 percent, while the military expenditure—by 45 percent. You try and figure out how we could have solved this. And altogether the share

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11"On the Program for Forthcoming Activities of the USSR Government," Izvestiya, June 8, 1990. Ryzhkov almost certainly referred to the budgetary definition of defense, which excludes some activities that are usually included in estimates of defense spending and reflects some anomalies in pricing of defense goods and services. See discussion below.
of military expenditure in our country had reached 18 percent of the national income. There is no such state in the world.12

The decision to accelerate the growth in defense spending at a time when the Soviet Union was embarking on a massive restructuring and renovation of its economy seems almost inexplicable, even taking into account past defense program decisions and the threat from U.S. programs. Here the Gorbachev factor comes into play. As his actions have demonstrated time and again, he is willing to take chances—to set his sights high and then retreat if necessary. He reportedly rejected various versions of the draft 1986-90 plan, telling Gosplan to set higher goals—especially for the investment necessary for his industrial modernization program.13 By the fall of 1985, Gosplan Chief Nikolay Baybakov had been fired, but Gorbachev had a five-year plan to his liking. The plan was inconsistent and infeasible. It was inconsistent because the goals for aggregate production were not supported by enough planned growth in energy or basic industrial materials, especially steel, while the investment plan was weakly supported in terms of construction materials. It was infeasible because the projected growth in national output, overall and in most major sectors, was not supported by the necessary labor and fixed capital. To paper over these contradictions, the plan assumed unrealistic progress in saving metals, fuels, and other industrial materials and an extremely unlikely turnaround in the return on new fixed investment.14 To obtain an upsurge in productivity, Gorbachev was relying on human factors in the short run—notably, the expected results from imposing greater discipline in the workplace, reducing alcohol consumption, and firing incompetent managers and officials. In the medium term (perhaps 1988 or 1989 and thereafter), the modernization campaign was to provide the momentum for uskoreniye—the acceleration of the growth of GNP to roughly 4 percent per year in 1986-90 and to about 5 percent per year in 1991-2000.15 Economic reform had not yet come on stage.

Finally, the 1986-90 plan depended on the success of what some Soviets described as a "grand maneuver." Consumption's share of national income was to be reduced in favor of investment (and defense). In the next (1991-95) plan the share of consumption would be restored, and consumption levels would rise briskly on the strength of uskoreniye (acceleration)

12Mikhail Gorbachev, "Speech to Nizhniy Tagil Workers," Moscow Domestic Service in Russian, 1545 GMT, April 27, 1990. Ten days later, Yegor Ligachev told an interviewer that the Soviet defense budget "amounts to 18-20 percent of the national income (natsionalny dochud)." Moscow Television Service in Russian, 1242 GMT, May 7, 1990.
13Noren, loc. cit., p. 10.
in both the quantity and quality of production. As developments in society proved, the assumption that the population would wait patiently for its reward was another infeasible component of the five-year plan.

THE BEGINNING OF PERESTROIKA IN THE DEFENSE SECTOR

When economic perestroika faltered in 1987-88 while political restructuring flourished, the defense sector lost its privileged position.

Developments in the Economy

To the leadership it probably seemed that a promising beginning in the economy was suddenly coming apart. First quarter results for 1987 were alarming, the consequence partly of winter storms and the introduction of a state inspection system (gospriemka) that halted growth in machine-building output. The economy was also buffeted by ministerial and enterprise staff changes and wage and financial reforms. Goals for assimilating the sharply rising volume of investment were badly underfulfilled, and net farm output fell by 2.5 percent. The poor results in 1987 did not convince the leadership to back away from the five-year plan schedule, however. Instead, it adopted a wholly unrealistic 1988 plan that in the main preserved the original targets that had been laid out for that year three years earlier. To achieve these goals would have required growth over actual 1987 levels of 8 percent for GNP, 6 percent for agriculture, 9 percent for industry, and 20 percent for machinery.16 The year turned out quite differently, with GNP increasing by 2 percent, industry by about 3 percent, and machinery output by 2.5 percent (table 5.1). Agricultural production declined for the second straight year putting further pressure on food supplies.

During 1987 and 1988, the consumer discontent that forced a radical change in regime policies began to gather steam. Per-capita consumption of food and soft goods did not increase at all during these years. In particular, the decline in farm output and disruptions in processing, marketing, and distribution connected with the partial transition of enterprises to direct contracting with suppliers and customers provoked food shortages that angered an increasingly sullen population.17 The shortages, however, were only partly

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17 Perhaps the best-known example of the changed mood of the population was the reception Gorbachev encountered in a trip to Krasnoyarsk in September 1988. The crowds complained bitterly about the lack of food, housing, schools, and health care.
attributable to supply-side factors. By 1988, especially, the traditional constraints on the population’s income had weakened substantially. According to CIA estimates, total disposable cash income increased by 8 percent in 1988 while the real volume of goods and services available for purchase grew by only about 4 percent. It was this rise in excess demand for consumer goods and services that explains much of the growing tension in consumer markets and the steep growth in the savings deposits of the population.

Meanwhile, the objective—industrial modernization—for which Gorbachev had begun the “grand maneuver” was receding into the distance. The machine-building sector had been asked to do too much: retool, raise quality, renovate the product mix, and accelerate the growth of machine-building output.\(^\text{18}\) By the end of 1988, commissionings of new fixed capital continued to

lag behind the growth of investment, and there was a general consensus that the technological level of new models of machinery was not high enough to support a genuine modernization of the economy. The sector itself was dispirited and confused by its efforts to respond to the demands from above, and the leadership began to relax some of its pressure.\footnote{Andrew J. and Bonnie K. Matosich, “Machine Building: Perestroika’s Sputtering Engine,” pp. 164-170.}

During 1988, the government took some first tentative steps to address the problems in the consumer sector and the modernization campaign. State production of alcohol was increased to sop up some of the population’s buying power and recoup some of the tax revenue that had been lost to home distilling. Gorbachev also took a more insistent stance toward the participation of the defense-industrial sector in consumer programs and industrial modernization. In 1986-87 the defense industry was repeatedly criticized for not paying more attention to the output of investment goods and consumer durables, but apparently to little effect. In late 1987 the pressure was stepped up. At an October Central Committee plenum on the food-processing industry, Premier Ryzhkov gave the defense-industrial ministries specific targets for deliveries to the food-processing sector, and in February 1988 it was announced that the civilian ministry supplying equipment to the light and food industries would be abolished and its 260 enterprises assigned to various defense-industrial ministries. Throughout this period, however, there was no sign that targets for military production had been scaled back to accommodate defense industry’s new responsibilities for civil production. Indeed, according to CIA estimates, real defense outlays spurted by 5.5 percent in 1987, and military procurement by 7.5 percent.

The Debate Over National Security Policy

As economic performance tailed off, an expanding debate over national security policy began to impinge on military prerogatives. Glasnost paved the way with swelling criticism of past national security decisions and management. The decisions to put troops in Afghanistan and deploy SS-20 missiles, for example, were questioned.\footnote{Andrey Kozyrev, “Confidence and the Balance of Interest,” \textit{Mehdunarodnaye zhizn}, No. 10, October 1988 (br. in FBIS-SOV-88-206 annex, 25 Oct 88, p. 3).}\footnote{Larrabee, loc. cit., p. 1006.} Larrabee believes that the sour taste left by these episodes as well as the air defense weaknesses exposed in the September 1983 shutdown of the KAL passenger jet together with a conflict over defense spending led the party to “reassert greater control over the military and defense matters.”\footnote{Andrey Kozyrev, for example, wrote that:}
Blaming the US military-industrial complex for everything, as usual, bureaucrats who were prepared to place departmental interests above state ones not only pursued but played along with the logic of an arms race imposed on us by the ideologists of attrition. At the peak of the stagnation period, matters reached a point where our “counteraction” began to outstrip their “action,” which ultimately damaged our own interests.\(^{22}\)

Another civilian argued that the Soviet Union attained parity with the United States but didn’t stop there, “a serious-economic and political-miscalculation.”\(^{23}\) In the same vein, Dawisha’s study of the new literature on the use of Soviet troops abroad leads her to argue that “Starting in early summer 1988, there have been widespread analyses concluding that practically the entire history of postwar Soviet foreign policy was based on great power ambitions” rather than the defense of socialism.\(^{24}\)

The military’s response to these changes has been slow and grudging. By 1989, however, General Yazov in his capacity as Minister of Defense could admit that “sams of our steps could have been different and not symmetrical” although “reactionary and aggressive circles of the West” were responsible for unleashing a “protracted and exhausting cold war.”\(^{25}\) But I. S. Belousov still maintained that although the outlays were large, “in the situation of the cold war and the arms race there was no other way.”\(^{26}\)

The criticisms of past defense decisions and programs were accompanied by an inconclusive discussion of “how much defense is enough.” In an April 1987 speech in Prague, Gorbachev declared that Soviet defense spending would only provide for razynnya dostatochnost or “reasonable sufficiency.” The Warsaw Pact Political Consultative Committee signed on to this concept in a May 1987 declaration on military doctrine. The formulation has been used—mainly by civilian analysts—in arguing that the USSR does not have to answer every military program undertaken by a potential enemy with one of its own. It has also been employed to justify unilateral reductions in programs.\(^{27}\) The most recent and most authoritative attempt by the Soviet military to convey a sense of what reasonable sufficiency means was by Minister of Defense Yazov in Kommunist. According to Yazov:

\(^{22}\)Kozyrev, op. cit.
\(^{26}\)Moskovskaya pravda, October 24, 1989.
At the present time, notions about defense sufficiency are being rid of the deformations of the past and filled with qualitatively new content. As is well known, until comparatively recently these notions were linked exclusively with the readiness and capability of the armed forces of the state to conduct active offensive actions. Today, defense sufficiency is understood to mean conducting all measures in the military sphere in strict accordance with the extent of the real threat and with the minimal requirements for defense.28

This objective is to be pursued in several areas:29

<table>
<thead>
<tr>
<th>Area</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Military-economic</td>
<td>Reduce the defense share of GNP as far as possible and carry out defense-civil conversion intelligently.</td>
</tr>
<tr>
<td>Military-technical</td>
<td>Focus R&amp;D on the weapon developments and hardware that reliably satisfy defense requirements at least cost.</td>
</tr>
<tr>
<td>Military-scientific</td>
<td>Verify theoretically and spell out specifically the qualitative and quantitative parameters of reasonable defense sufficiency.</td>
</tr>
<tr>
<td>Military-political</td>
<td>Take steps to give stability and predictability to military aspects of relations among states, while excluding the use of military force to achieve foreign policy goals.</td>
</tr>
<tr>
<td>Ideological</td>
<td>Strip defense thinking of ideas of military supremacy and &quot;images of the enemy.&quot;</td>
</tr>
<tr>
<td>Military</td>
<td>Organize and train the forces to ensure a reliable defense.</td>
</tr>
</tbody>
</table>

Based on this fairly general guidance, defense planners are to develop programs and defend them during the review process.

But before the concept of reasonable sufficiency could be expected to shape force planning and defense budgets from below, the Soviet leadership had launched a number of initiatives in the arms control arena. They included proposals for a nuclear test ban moratorium and for the elimination of all nuclear weapons over a 15-year period. At the 27th Party Congress, Gorbachev declared that no state could any longer defend itself by military-technical measures alone. “Security,” he said, “is increasingly a political task, and it must be solved by political means.”30 As for the broader definition of national security, Gorbachev stressed the importance of economic revitalization to the USSR’s superpower status and argued that security must be “mutual

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28Yazov, loc. cit., p. 65.
29Ibid., p. 65.
security"—that is, that one side could not ignore the security interests of the other side in international negotiations.

Gorbachev had good reasons to take the offensive on arms control. He certainly hoped to block the development of the U.S. SDI and probably thought NATO's military modernization could be slowed during the long process of negotiating agreements. If the Soviet Union could not curb Western programs, the consequences for future Soviet defense budgets would have been frightening for perestroika. Higher spending on strategic systems to counter an SDI or create a Soviet version, for example, would drain away many of the high technology resources that were counted on for industrial modernization. Any substantial rise in conventional programs would require an offsetting decline in civil investment because the machine-building sector was already working at full capacity. Gorbachev apparently decided that he had to manage the East-West military competition in a way that would protect his domestic agenda. But the prize was not the immediate gains from agreements on intermediate-range missiles, chemical weapons, and the like. More likely he wanted to prevent an open-ended competition in the future.

Organizational Restructuring

During 1987 and 1988, the turnover in leadership in the party and government continued at a frenetic pace. Perestroika in the military bureaucracy began somewhat more slowly, but between the summer of 1985 and the summer of 1988, Gorbachev had replaced 10 out of 16 deputy defense ministers; the chief of the Strategic Rocket Forces; the heads of the Group of Soviet Forces in the GDR, Poland, and Hungary; and the commanders of the Moscow and Byelorussian military districts.31 In the wake of Mathias Rust's dash through Soviet air defenses in May 1987, Defense Minister Sokolov was replaced by General Yazov and the head of the Soviet Air Defense Force, Marshal Alexander Koldurov, by General Ivan Tretiak.

In somewhat the same way as did defense industry, the military establishment resisted perestroika that aimed at more than a renewal of personnel. In public speeches top military leaders were rather off-handed in their treatment of the topic. Some tended to define restructuring narrowly as aimed at ending corruption, improving discipline and training, and conserving resources. This focus on improving efficiency was to dominate perestroika in the military during this period; only later did it encompass adapting to reductions in military spending and reorganizing military forces in the light of changing military doctrine.

The restructuring that did take place centered on:

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31 Larrabee, loc. cit., p. 1008.
• *Strengthening Policy Control*. Gorbachev named Alexsey Lizachev to replace Aleksey Yepishev as Chief of the Main Political Directorate and removed most of the chief political officers in the military districts, fleets, and groups of forces. The military press also reported an increase in party aktiv meetings.

• *Resource Conservation*. Saving money through better operations and maintenance practice is a natural complement to the emphasis (and dependence) on material savings in the 1986-90 economic plan. How much was accomplished is unclear.

• *Training*. Attempts have been made to raise the standards of training for both conscripts and officers, and the Soviets announced plans to improve political indoctrination and pre-military training. But a particularly strong emphasis was placed on better combat training under more realistic conditions.

• *Discipline*. The campaign in the civil economy against drunkenness, corruption, and slackness was soon extended to the military.

**The Debate on Doctrine**

When Gorbachev came to power, a debate over military doctrine had been bubbling for some time. By 1985, both the civil and the military leadership had declared that a nuclear war could not be won, and highly mobile conventional forces equipped with powerful precision weapons were being pushed by the followers of Marshal Ogarkov.\(^{32}\) But the new Soviet military leaders stress the "newness" of the doctrine developed since 1985. Former Chief of the General Staff Akhromeyev has said that a new military doctrine was "elaborated" in the period 1985 through 1987 in both the USSR and the other Warsaw Pact states.\(^{33}\) This was necessary because a new foreign policy had been formulated—one that removed force from "the arsenal of foreign policy" and ideology from the "sphere of interstate relations" and built these relations on the basis of equality with all states. These guidelines, he maintained, were "already far from corresponding in full measure to the military doctrine by which we were guided in the mid-1980s."

He summarized the military-political propositions of the new military doctrine categorically: the USSR won't be the first to start a war or to use nuclear weapons, it sees no state or any people as an enemy, and it has no territorial claims against anyone. The military-technical part of the doctrine had to be more flexible, however, because it depended on how the military-political situation evolves. It has to answer four questions:

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\(^{33}\) Interview in Kommunist vooruzhennykh sil, No. 1, January 1980.
• Who is the probable enemy?
• What kind of aggressions should the USSR prepare for?
• What kind of armed forces are needed for this?
• How do these forces need to be trained?

Herspring concludes that in the latter part of 1987 and the first half of 1988 “military analysts began to provide the outlines of future Soviet strategy.” Elevating the importance of defensive operations, they argued for a strategy of attrition and a restructuring of forces so that they could mount an offensive only after a considerable period of time. Presumably, this would convince the West that a defensive doctrine was truly in place. In this connection, Herspring cites an article by General Makhmut Gareyev in the Bulletin of the Atomic Scientists in which Gareyev suggests a scheme of mutual troop withdrawals that would rule out surprise attacks as well as a number of reciprocal steps to build mutual confidence and ensure deterrence at lower force levels. In the West, however, students of Soviet military affairs wondered when and how the innovations in doctrine would affect force structure and training.

Assessing the Impact on the Defense Sector

CIA estimates that real Soviet defense spending continued to increase in both 1987 and 1988. Gorbachev, on the other hand, told the Congress of People’s Deputies in May 1989 that actual outlays for defense had leveled off in 1987 and 1988—implying a decline in real spending if inflation is taken into account. The reduction appears inconsistent with what CIA and DIA found to be a rise in procurement in 1987, led by outlays for naval and missile procurement. Moreover, when the USSR later first released a figure for total defense spending in rubles, it was far less than the CIA and DIA estimates. This discrepancy continues to complicate analysis of what the Soviets are doing in defense, particularly analyses based on Soviet statements that employ figures for procurement, R&D, and other spending categories that seem out of line with estimates based on a building block approach.

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36 Mikhail Gorbachev, May 30, 1989 speech to the Congress of People’s Deputies.
Decision to Involve Defense in Rescuing the Economy

Although defense programs appear to have proceeded with considerable inertia through 1988, the Soviet leadership was working out some important decisions that promise to alter markedly the course of these programs. The outcome of these decisions—large unilateral cuts in defense spending—was partially revealed by Gorbachev in December 1988 and January 1989; the decisionmaking process however, is still murky.

The reasons for the decision to reduce defense spending unilaterally appears to have been the leadership’s recognition that both economic and political restructuring were endangered if the population’s living standards did not begin to show some noticeable improvement. Moreover, the Politburo apparently became convinced that a reallocation of the nation’s resources in favor of defense could not await completion of negotiations on reducing strategic and conventional forces. Instead the strategy would be to induce a drawdown in Western military programs by going first. In any case, in the first half of 1988, military planners were probably told to work out some proposals for sizeable force and program reductions. As Marshal Akhromeyev stated in Ogoniok in late 1989, the USSR’s political and military leaders “jointly” decided that an improved international situation and reduced tensions and threat of war made a cutback in the armed forces possible. Therefore, “during the second half of 1988, a great deal of research work was carried out: command staff and staff studies of various dimensions were conducted, the balance of military forces in the future was calculated, the possible course of arms reduction was subjected to critical analysis.”

According to Akhromeyev, the participants in this process included the leadership of the Ministry of Defense, various branches of the armed forces, scientific research institutes, and military academies. In addition, “the necessary calculations” were carried out in the defense-industrial ministries. By late 1988, “the figure of 500,000 men emerged—the number by which the Army and Navy could be cut.” The reductions would be accompanied by withdrawals of forces from Eastern Europe and a restructuring of forces there and in the Soviet Union to give them a more defensive orientation.

Force reductions by themselves, however, would do little to ease the economic strain. They would provide a small one-time increment to the labor force and lower the requirements on defense industry for the periodic replacement of the stock of weapons and equipment. If the defense sector was to be of appreciable help in the near term, substantial cuts in military procurement and R&D would be necessary. (In this connection, the weak response of the defense

40 Ibid.
industry to leadership pleas for greater civil production may have convinced Gorbachev that the defense industry could not contribute in a major way to perestroika until the demands on it for military production had been relaxed.) In his December 1988 UN speech, Gorbachev had not mentioned the level of military spending that would be associated with the force reductions he announced then. But in January 1989 he told the Trilateral Commission that defense outlays would decline by 14.2 percent and military production by 19.5 percent over a period of two years.41

Concern over the budget deficit with its consequences for excess demand in markets for both consumer goods and industrial supplies also began to carry some weight in the debate over defense programs in late 1989. Holloway notes that some Soviets in early 1989 said that a desire to cut the budget deficit was an important element in the decision to reduce defense spending.42 The revelation that the budget had been in deficit,43 however, generated almost no reaction in the Supreme Soviet meeting during the fall of 1988, and the original state budget for 1989 implied an increase in the deficit to about 100 billion rubles. Abel Aganbegyan contends that the leadership simply did not comprehend the nature of the USSR's financial situation until some emergency meetings in December.44 A government commission chaired by Ryzhkov then prepared a plan to bring the expected 1989 budget deficit down from 120 to 90 billion rubles by a combination of further cuts in defense spending and centralized state investment.45

THE CURRENT STATE OF PERESTROIKA IN THE DEFENSE SECTOR

By the spring of 1990 it has become possible to take a reading on the progress made in implementing the decisions made in 1989 regarding perestroika in the military forces and defense industry as well as other aspects of Soviet national security policy.

Force Reductions and Restructuring

General Moiseyev, Chief of the General Staff, reports that in 1989 the Soviet armed forces were pared by 265,000 men—more than halfway toward the announced goal of a cut of 500,000. Other reductions were said to include 9,321 tanks, 5,052 artillery pieces, 835 fighter aircraft, and

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41 CIA/DIA Report to the JEC, "The Soviet Economy in 1988: Gorbachev Changes Course," p. 11. The precise period of implementing these reductions became unclear, however, as different Soviets used alternative formulations. It now appears that the planned percentage reductions are meant to reflect levels of spending in 1991 compared with levels of spending in 1988.

42 Holloway, loc. cit., p. 11. He cites articles by E. Shashkov (Kommunist, No. 4, March 1989) and Aleksey Kireev (Ogaryek, No. 19, May 1989).


140 naval vessels. In addition, the USSR's military organization was rearranged to eliminate two military districts, two combined arms armies, four army corps, 21 combined arms divisions (13 motorized rifle divisions and eight tank divisions), and a number of "formations and units with other armaments."\(^{46}\) Meanwhile, negotiated reductions proceeded, with all short-range nuclear missiles and more than 70 percent of the Soviet MRBMs destroyed.\(^ {47}\)

According to Moiseyev, the force structure is also acquiring more of a defensive character. He points especially to the number of tanks being removed from combined arms formations—40 percent of all the tanks in motorized rifle divisions and 20 percent of the tanks in tank divisions.\(^{48}\) The promised withdrawal of Soviet troops from Eastern Europe had also been identified by the USSR as a part of a transition to a defensive stance. Moiseyev reports that in 1989 the USSR withdrew three tank divisions, three armored training regiments, four landing and assault units, some bridging units, and 500 warheads for tactical nuclear missiles. He adds that "I would like to specify that the armored divisions withdrawn have been disbanded."\(^ {49}\) In Vienna in January 1990, Moiseyev also said that 50,320 men, 3,188 tanks, 768 guns, and 350 combat aircraft had been taken out of Mongolia.\(^ {50}\)

These Soviet claims probably can be accepted in the main. At least, no Western government has so far questioned them. If controversy does arise, it is likely to be over timing and definitions—whether Soviet plans to accomplish a certain action in 1989 were actually fulfilled or what the Soviets include in their definition of a "tank" or "artillery piece."

Military Operations

The Chief of the General Staff claims that operational training and combat training in the USSR already have been adapted to the requirements of defensive doctrine. To this end, "exercise and training manuals and the programs of our military academies have been revised."\(^ {51}\) Using the open literature, the accuracy of Moiseyev's statements cannot be verified. In any event, Soviet generals do not speak with one voice on the matter. Writing at about the same time as General Moiseyev, General P. G. Lushev said that defensive operations "at the beginning of the war" are being brought to the foreground on the strategic, operational, and tactical levels.

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\(^{46}\)Interview in L'Humanite, February 2, 1990, p. 13, (FBIS-SOV-90-027, 8 Feb 90, pp. 112-14).

\(^{47}\)Dmitry Yazov, "A New Model of Security and the Armed Forces," Kommunist, No. 18, December 1989, p. 66.

\(^{48}\)Moiseyev, loc. cit.

\(^{49}\)Ibid.

\(^{50}\)S. Orlov and M. Kolpakov, Krasnaya zvezda, March 1, 1990, p. 3.

\(^{51}\)Ibid. (emphasis added).
while “fundamental documents” on preparing forces for combat “are being revised based on this.”

In one area, however, an operational trend that began around 1985 seems to have continued—the decline in time at sea for most surface ships and submarines as well as in major exercise activity far from Soviet territory. According to the Washington Post, a “dramatic decrease in Soviet submarine patrols and other naval operations worldwide” has led the U.S. Department of Defense to propose sharp reductions in U.S. anti-submarine warfare programs. This subsidence in activity, however, probably has less to do with defensive doctrine than cost-cutting. The Soviet navy has a large number of old submarines, in particular, that are expensive to operate and whose service lives can be extended if they are deployed less intensively.

The Soviet armed forces also have not been insulated from the troubles of economy. Military leaders complain of having to grow their own food and work on civilian construction projects, and the Chief of the Rear Services of the Soviet armed forces speaks of problems becoming “more critical” in a number of areas, partly because of the economic difficulties in the country and the relaxation of central planning. He singled out a “wave of losses and thefts” in certain parts of the rear services and the lack of effective inventory checks and auditing. His description of problems and weaknesses sounds very much like an analysis that could be made of the state retail trade network over the past few years.

Military Production

The Soviets have not said how much military production declined in 1989 in line with their promise to reduce it by 19.5 percent by 1991. The production of tanks did decline substantially, however. And, according to the Deputy Chief of the Soviet Air Force’s Main Staff, the procurement of aircraft also fell in 1989—by 9 percent in numbers and a little more than 2 percent in value.

Military Spending

With the gradual and grudging release during 1989 of information on the Soviet defense budget, the official position on what happened in 1989 and what is planned for 1990 can be put

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together (See Table 5.2). Thus, the USSR declares that after a freeze on defense spending in 1987 and 1988, outlays fell in 1989 and are to decline by another 8 percent in 1990.

The announced spending in almost all of the categories listed in Table 5.2 is much less than Western estimates. CIA and DIA, for example, estimate that defense spending is 15 to 17 percent as large as Soviet GNP, which would put total defense spending in 1988 in the range of 130 to 150 billion current rubles. Part of the difference is clearly due to differences in coverage: The Western estimates include outlays for the militarized MVD, KGB border guards, construction troops, railroad troops, and some outlays on space programs that are not considered to be part of the defense budget by the Soviets. But definitional differences are unlikely to account for more than one-third to two-fifths of the discrepancy. The reasons for the remaining difference may be clarified if glasnost continues to unfold in the defense sector, but for the moment the two most likely explanations are subsidization of Ministry of Defense purchases of goods and services and a CIA/DIA failure to estimate correctly the effect of the 1982 price reform on prices paid in military procurement.59

Meanwhile, Soviet military leaders are defending the newly released defense budget figures with great vigor. Marshal Akhromeyev, for example, wrote to Ogonyek saying that, “for decades, the appropriate organizations of the U.S. Department of Defense have been systematically and deliberately overstating the Soviet Union’s military spending.” Vitaley Korotich, Ogonyek’s editor, was unconvinced, answering, “doubts remain despite your assurance of the complete trustworthiness of its (i.e., the defense budget’s) figures.”60 In a

59 As noted above, Gorbachev said in April 1990 that in the mid-1980s Soviet military spending was 18 percent of national income, and in May Ligachev said it was 18-20 percent. This implies a level of spending of 104 billion rubles in 1986 if Gorbachev’s comparison refers to the year 1985 and roughly 125-135 billion rubles in 1990 if Ligachev is giving a ratio for the year 1990.
60 Akhromeyev, loc. cit., pp. 9, 13.
Table 5.2
Announced Spending on Defense in USSR
(in millions of current rubles)

<table>
<thead>
<tr>
<th>Category</th>
<th>1988</th>
<th>1989</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total appropriations for defense</td>
<td>77,294.2</td>
<td>70,975.8</td>
<td></td>
</tr>
<tr>
<td>Purchase of armaments and equipment</td>
<td>32,600.0</td>
<td>30,036.5</td>
<td></td>
</tr>
<tr>
<td>Research and development</td>
<td>15,350.0</td>
<td>13,036.5</td>
<td></td>
</tr>
<tr>
<td>Maintenance of army and navy</td>
<td>20,244.0</td>
<td>20,204.4</td>
<td>19,323.3</td>
</tr>
<tr>
<td>Personnel maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Military</td>
<td>6,229.0</td>
<td>5,765.9</td>
<td></td>
</tr>
<tr>
<td>Civilian</td>
<td></td>
<td>1,032.1</td>
<td></td>
</tr>
<tr>
<td>Material: technical supplies and combat training</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food and clothing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provision of personal and medical services, household and communal facilities of troops</td>
<td>1,191.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance, operation, and repair of weapons and equipment</td>
<td>3,284.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Military transportation and leasing of communications</td>
<td>1,938.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battle, operational, physical, and political training of troops; maintenance of airfields, bases, and depots</td>
<td>3,181.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Military construction</td>
<td>4,596.3</td>
<td>3,715.8</td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>1,042.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social-cultural, domestic</td>
<td>669.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital repair of housing, communal facilities, and main service networks</td>
<td>306.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pension payments</td>
<td>2,280.0</td>
<td>2,440.0</td>
<td></td>
</tr>
<tr>
<td>Other (production and delivery of nuclear charges)</td>
<td>2,360.0</td>
<td>1,306.2</td>
<td></td>
</tr>
</tbody>
</table>

similar vein, Academician V. Avduyevskiy, Chairman of the National Commission to Promote Conversion, was asked if he could obtain the figures on military industry necessary for the commission's work. He replied that the commission still did not have adequate information to understand the “Soviet military-industrial complex and that even now the official figures do not inspire confidence.”
Let us think about this: what is this annual defense ministry budget of 70 billion rubles? We say that we have parity with the United States. But they have an annual military budget of $300 billion. Granted, we have cheap manpower and cheaper army upkeep and materials, but there is still too big a difference, especially given our lower labor productivity.

He concluded that “We are simply dealing once again with ‘crafty’ figures, different methods of calculation.”

Pruning the Cost of Empire

In parallel with decisions to cut back on military programs while redefining the basis of Soviet national security, the USSR began a retrenchment with respect to its interests and commitments abroad. The questioning of past military and foreign policy singled out Soviet intervention in Hungary, Czechoslovakia, and Afghanistan as mistakes that should not be repeated. Dawisha argues that “the spirit behind the Brezhnev doctrine has been replaced by an anti-internationalist mood in both Soviet elite and popular circles.” She cites a poll by the Komsomol’s Scientific Research Center in which only 6 percent of those asked approved all types of military aid while 32 percent opposed all military assistance.

Reflecting this disillusionment with foreign involvement, the Soviet Union had by the end of 1989 withdrawn its military units from Afghanistan and was encouraging settlements of military conflicts in Angola and Cambodia. TASS reported that MiG-23s and TU-16s were withdrawn from Cam Ranh Bay at the end of 1989, and a Soviet Foreign Ministry spokesman reported in February that Soviet advisors had been removed from Eritrea and “other northern regions of Ethiopia.”

Economic aid was also a target as Soviet analysts reviewed the returns on the cumulative investments dating back to the early Khrushchev period. Demands for repayment of old loans and a stingier stance toward new aid marked the new policy. Even Vietnam and Cuba, two of Moscow’s oldest allies in the Third World, felt the squeeze. The Soviet Union has reportedly told Hanoi that it intends to cut aid by about one-third beginning in 1991. According to a Washington Times report, Soviet diplomats in Geneva said pressure was building to reduce the $6.5 billion-a-year aid program for Cuba. The more parsimonious attitude toward foreign aid

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62Dawisha, loc. cit., p. 5.
63TASS, January 18, 1990.
64Moscow in English to Africa, 1700 GMT, February 8, 1990.
was reflected in the 1990 state budget, which stipulated a decline of 2.8 billion rubles (or 22 percent) in expenditures for "credits and foreign aid."

Savings from cutbacks in military and economic aid to the Third World, however, would not be nearly as large as those that would accrue if the USSR follows through on its intention to put its trade with Eastern Europe on a hard-currency, world-price basis. The terms-of-trade effect would—according to some Soviet economists—increase the USSR's net exports earnings by roughly $10 billion per year and convert existing Soviet trade deficits vis-à-vis Eastern Europe into sizeable surpluses.  

**Defense Planning and Oversight**

The basic framework of defense decisionmaking remains the same under perestroika. What has changed is the relative influence of the various institutional actors and the introduction of an embryo layer of legislative review of defense policy.

The main loci of defense decisions still seem to be the Politburo and the Defense Council—a group of senior political and military leaders. Institutions participating in formulating policy options on force structure, defense spending, weapons development, etc., include the Ministry of Defense, the General Staff, the KGB, the Ministry of Foreign Affairs, some parts of the Central Committee apparatus, the Military-Industrial Commission, and some Academy of Sciences institutes. Under Gorbachev, however, the influence of the Ministry of Foreign Affairs and experts in the Academy of Sciences (especially the Institute of World Economic and International Relations and the Institute of the USA and Canada) has risen. More generally, Gorbachev has greatly expanded the flow of information on defense matters by involving more experts and a wider range of opinions.

In 1989, two Supreme Soviet committees were established with oversight responsibilities over national security: the Defense and State Security Committee (DSSC) and the International Affairs Committee (IAC). They are to review and approve treaties and protocols and hold hearings on the budgets for defense, foreign affairs, and internal security. They also confirm appointments to senior positions in these bureaucracies, carry out special studies for the Supreme Soviet, and propose legislation. The DSSC has 43 members, is headed by Vladimir Lapygin, a defense industry designer and manager, and is loaded with people from the national security arena (six military officers, 19 people with defense industry experience, seven

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intellectuals knowledgeable about national security issues, and three KGB officers). The IAC has a more diverse background and seems to be dominated by Gorbachev supporters. At any rate, the DSSC has been belabored for its conservative stance. Aleksey Arbatov, for example, called its work "especially disappointing" and said it was more like a "secret branch of the defense ministry and the military industry" than part of a democratic parliamentary forum.\(^69\)

**PROSPECTS**

**Morale in the Defense Sector**

The changes in the defense sector coupled with developments in the country have arguably had the greatest impact on the morale and self-esteem of both the armed forces and defense industry. First of all, the demobilization of 500,000 servicemen and the withdrawal from Eastern Europe is not going smoothly. Enlisted men could be absorbed into the economy relatively easily. Both the military leadership and the government were more worried about the officers who were to be released. *Krasnaya zvezda* reported receiving more than 1,000 letters related to the implementation of these reductions. Some of them charged that those discharged were "being forced to fight for the benefits to which they are entitled," especially housing.\(^70\)

Freer discourse in the Soviet Union has also uncovered a great deal of discontent over pay and working conditions in the armed forces. The complaints range from low pay to poor food and housing and exploitation. As one letter to *Krasnaya zvezda* put it, "As long as the chief of a public toilet cooperative earns more than a submarine commander, submarines will sink and officers will leave the army." The Soviet government is struggling to improve conditions of military life. In January 1990, officers’ pay was raised by 50 rubles per month, officers’ proficiency pay increased by 25 rubles per month, and housing allowances of 30 to 90 rubles per month were introduced. The estimated cost of the entire package is 1.2 billion rubles, which was to be paid for by economies in the rest of the defense budget.\(^71\)

As discontent over the conditions of service life came out into the open, an even more explosive issue sapped armed forces' morale—their involvement in suppressing civil unrest. Indeed, two army colonels stationed in Baku reportedly sought to persuade Gorbachev not to intervene to put down a nationalist uprising,\(^72\) and three junior officers declined a suggestion that they go to Baku to fill positions there.\(^73\)

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\(^69\) *Moscow News Times*, No. 1, 1990, p. 25.

\(^70\) *Krasnaya zvezda*, January 25, 1990, p. 2.


In this context, General Yazov has defended the use of his forces in the Transcaucasia as necessary to stabilizing the situation rapidly. But:

I do not say that everything turned out as I would have wished. At first one psychological factor that I would call the "Tbilisi" syndrome hampered the military from acting in a clear-cut manner according to orders, and, ultimately, according to their duty. This is a new phenomenon. It must be studied.\textsuperscript{74}

Yazov recommended a legislatively backed mechanism that would be triggered in an extraordinary situation.

Draft evasion had become a serious problem toward the end of the Afghan intervention, and the torrent of criticism directed against the military coupled with growing ethnic tensions have made it worse. Recent press reports cite an increasing incidence of evasion from all parts of the Soviet Union. The Soviet Minister of Defense noted in a radio interview the campaign in the Baltics and in the Transcaucasia to obstruct conscription. He concluded that with the spring call-up approaching and the universal conscription law still on the books, "we should demand that people be brought to book for anti-army propaganda, in line with the Constitution."\textsuperscript{75}

\textbf{Outlook for Further Defense Cuts}

Over the near term—1990 to 1991—the Soviet defense sector almost certainly will continue in decline. In 1990, the leadership found itself in the circumstances that Premier Ryzhkov described to the Congress of People's Deputies in June 1989: the economy could not cope simultaneously with (1) raising popular welfare and resolving social problems, (2) developing an effective economy, and (3) guaranteeing "the highest level of the state's defense capabilities."\textsuperscript{76} In fact, the pressure to raise living standards and defuse popular anger was much greater now than it was in 1985 because expectations had been raised only to be dashed.

The Ryzhkov economic stabilization program adopted in December 1989 pointed the way. The 1990 state budget, as already noted, called for the defense budget to fall by 6.3 billion rubles. Ryzhkov also declared that in order to continue to reduce the budget deficit in 1991, the growth of outlays would have to be held down by a number of measures, including a "further reduction in

\textsuperscript{74}Yazov, \textit{Pravdelstvenny vestnik}, No. 6, February 1990, pp. 1, 8-9.

\textsuperscript{75}Interview with Dmitry Yazov, Moscow Domestic Service in Russian, 1100 GMT, February 17, 1990.

expenditures on defense and administration. General Lushev filled in more of the picture when he wrote that defense outlays would amount to 67.3 billion rubles in 1991. Presumably, however, these plans were formulated on the assumption that the stabilization program would work, that a START agreement will be in place, and that CFE negotiations will be far along. Should the goals for increased production of consumer goods and a reduction in the budget deficit be badly unfulfilled (a widely held view), the inclination to cut back further on defense programs would be strengthened.

The Soviet armed forces, nonetheless, are not going and will not go quietly along the path of budget reduction. Their leaders insist that the military threat to the USSR is still real and that NATO is not reciprocating the force and spending reductions begun by the USSR. More recently, the General Staff must be worrying about how the enormous changes in Eastern Europe are affecting the East-West military balance. Thus, with respect to reciprocity, Minister of Defense Yazov charges that Western military allocations are not declining; rather, NATO defense spending is slated to rise from $481.5 billion in 1989 to $502.2 billion in 1990. He also complains that U.S. training still is based on nuclear deterrence and flexible response. Lushev concludes that there is as yet "no appreciable reduction in the level of military confrontation."

Even in a longer-run perspective (after 1991), the defense sector is likely to be the loser in the jockeying for budget allocations. First, the Soviet leadership in the person of Chairman of the Council of Ministers Ryzhkov declared in the summer 1989 that the USSR intended to reduce the share of national income going to defense by between one-third and one-half by 1995. This target was reaffirmed early in 1990 by General Moiseyev in his L'Humanite interview. Taking into account Soviet statements regarding the present proportion of defense in national income and the targets for growth in national income in 1991-95, Ryzhkov’s statement implies a rate of decline in defense spending of 2 to 7 percent per year in 1990-95 (a rate, to be sure, that is applicable to the value of defense appropriations that has been revealed thus far by the Soviets, and not necessarily to the outlays still covered under other budgetary headings).

The fact that the five-year plan when finally adopted will probably call for continuing reductions in defense program is not the end of the bad news for the defense sector, however. The plan itself is highly unrealistic, both in its dependence on efficiency gains and on material

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77 Ibid., p. 21.
78 Lushev, loc. cit.
80 Lushev, loc. cit.
81 Ryzhkov, June 7, 1989 report to Congress of People's Deputies.
82 Moiseyev, loc. cit.
savings. With respect to productivity, this is most easily seen in the goal for the incremental output-capital ratio (growth of national income produced per ruble of capital investment in the productive sphere). According to the Ryzhkov guidelines for the 1991-95 plan, this incremental output-capital ratio will be 50 to 80 percent higher in the 13th five-year plan than in the 12th.\textsuperscript{83} A turn-around on this scale is not in the cards, and to the degree that production falls below plan, there is likely to be an inclination to look again at defense for resources to save the consumer program and reaccelerate the modernization campaign.

Perhaps the only development that would restore the defense sector's priority would be a reassessment of the external or internal threat to the Soviet state. Angry and worried about the collapse of Eastern Europe and the uncertainties surrounding German reunification, a more national-security oriented group in the upper levels of the party could rise to power. A failure to halt the progression of disorders in the non-Russian republics could also win support for stable, if not rising, military budgets. In the background, the behavior of NATO military spending would figure in the Soviet decision on whether additional cuts in defense programs were advisable. How attractive this would be, of course, would depend in part on how much of a return the USSR had obtained from defense conversion in 1990-92.

Adapting to Budget Constraints

How the Soviet armed forces might adapt to lower budgets in the 1990s can be discussed in terms of how the cuts might be apportioned and how the defense establishment could try to minimize their effects on military effectiveness. The unilateral cuts and withdrawals, already discussed, are only the beginning of the story.

What the Soviets have asserted about the composition of forces and spending provides some additional clues about the future. General Shabanov has said that the new military doctrine means that offensive arms will be reduced. He mentioned ballistic missiles, artillery systems, some kinds of cruise missiles, tanks, and aircraft.\textsuperscript{84} The November 1989 Ryzhkov Report also noted the need for a "practical realization of the new defense doctrine" as well as the new priority for civil production in the defense complex. It said preference would be given to the kinds of technology that determine the technological sophistication of equipment—radars, means of communications, information technology, means of automation, and high-precision weapons.\textsuperscript{85}

The ground forces are likely to be considerably smaller, and the strategic forces will also shrink. The outlook for the navy is unclear, although one civilian critic argues that to make our

\textsuperscript{83} ibid., p. 42.

\textsuperscript{84} Kommunist vooruzhennykh sil, No. 1, January 1990.

"war machine" more compact and flexible, the fleet or at least that part focused on global missions should be cut. He also singled out the PVO as an ineffective element whose routine modernization "swallows up tens of billions of rubles" and whose operation requires the services of half a million people.86

A general pruning and stretching out of major weapons programs is likely in any case. Before Gorbachev’s UN speech, the U.S. Intelligence Community had projected that a great many new systems would come into production in the late 1990s. Development of some of these weapons probably already has been curtailed or stopped. The 14-percent reduction in announced appropriations for military R&D in 1991 may signal the direction the Soviets are taking. In this regard, General Moiseyev stated in February 1990 that “the cessation of a whole series of experimental design projects will enable us to reduce expenditures.”87

The military and civilian leadership have also identified a better stewardship over resources, a higher level of training, and the substitution of quality for quantity as paths to maintaining force capability during a period of declining budgets. But the efficacy of all these approaches can be questioned. First of all, it will be difficult to bring about a more efficient use of POL, equipment, and the like when the officers corps’ morale is sagging because of demobilization, heavy outside criticism, and distaste for involvement in quashing internal unrest. For much the same reasons, enlisted men and noncoms are unlikely to care much about conserving resources. For the present, the measures taken to reduce defense costs through better management have, according to Moiseyev, resulted in smaller savings than had been contemplated. He said, “The main reason is that the struggle against thriftlessness and extravagance at all levels is still being waged very feebly.”88

To offset force reductions with better training is more of a long-term hope than a short-term prospect. Budget pressures will incline military leaders to plan fewer and smaller exercises and to use fuel and equipment more sparingly. Meanwhile, the new training manuals are still being written and digested. And the military participation in the civil economy (operating farms, building housing and roads, stepping in during national emergencies) has increased and is likely to continue at a high level—interfering with training schedules.

The substitution of quality for quantity in the procurement of weapons and equipment is not a panacea either. Through the 1970s and most of 1980s, the Soviets pursued both quantity and quality but then concluded that the technological gap separating them from the West was dangerously wide—one of the principal reasons for Gorbachev’s industrial modernization

86Blagovin, loc. cit.
88Ibid.
program. The military leadership seems united in declaring that the Soviet Union must not falter in developing and introducing new military technology. The military's procurement czar, General Shabanov, argues that "quantity must grow into quality," which will enable the USSR to have fewer arms without eroding the defensive capabilities of the armed forces.\textsuperscript{89}

The effects of perestroika on defense industry, however, have altered the trade-off between quality and quantity. Because of the switch to self-financing, defense-industrial enterprises are apparently raising their prices substantially. Shabanov talks of a "considerable increase in prices."\textsuperscript{90} Moiseyev complains that the military lives in a society subject to the "diktat" of the producer. Although its relations with defense ministries are based on contracts, the enterprises have switched to self-financing and the cost of equipment and some other work (probably repair and construction) has increased "2-3 times and more."\textsuperscript{91}

Moiseyev's figures seem high unless he is referring to trends extending over many years. But the deputy chief of the air force's main staff has given some figures on changes in the procurement of aircraft in units and in value in 1988-89.\textsuperscript{92} They imply a rise in average price for these aircraft of 7 1/2 percent in 1989 and 14 1/2 percent in 1990—reflecting a compound of mix change, technological advance, and open or hidden inflation. In a period of declining allocations for procurement cost, increases on even this scale imply sharp reductions in the quantity of new hardware available to the forces each year. It very possibly also means that the military power represented in the stock of weapons and equipment in the Soviet armed forces will fall in the 1990s because real improvements in average quality will fail to offset reductions in quantities purchased.

\textsuperscript{89} Kommunist vooruzhennyh sil, No. 1, January 1990.
\textsuperscript{90} Ibid.
\textsuperscript{91} "Arguments of the General Staff," Izvestiya, February 23, 1990.
6. SOVIET STATISTICS UNDER GORBACHEV:
A WESTERN PERSPECTIVE

Vladimir G. Treml

The purpose of this paper is to examine changes taking place in the Soviet statistical system under Mikhail Gorbachev, to place these changes in a historical perspective, and to review briefly the contribution to the quantitative analysis of the Soviet economy by Western specialists. The paper also explores the issue of usability and availability of economic data within the Soviet system.

WESTERN EVALUATION OF SOVIET STATISTICS

Before we assess changes in official Soviet statistics under Gorbachev, it would be instructive to summarize briefly the development of Western expertise in quantitative aspects of Soviet economic performance. It should be done also because we may be approaching the time when Western conventional wisdom concerning the Soviet statistical system will have to be revised in light of new evidence coming out of the Soviet Union.

Evaluation of the accuracy and usability of Soviet economic statistics differed widely among Western scholars and students of Soviet affairs in the 1930s and 1940s. Some believed that the official statistics published in Soviet sources were accurate. Others felt that Soviet statistics lie, and that, in fact, the USSR keeps “two sets of books.” One set of books, available only to the top leadership, was thought to encompass accurate, detailed, and well organized statistics covering all aspects of the Soviet economy. The second, much smaller set, open to the public, contained mainly data falsified for propaganda purposes and was thus virtually useless for analytical purposes.

As the Soviet Union emerged as a major world power and a potential adversary of Western democracies at the end of World War II, the interest in information on the Soviet system generally, and on the Soviet economy particularly heightened. Publication of economic statistics, however, virtually ceased in the early 1930s and, as the world emerged from the war, the USSR was the only major industrial power that did not publish summary statistical compendia or provide routine statistical information to the world community. Soviet economic data had to be gleaned and interpreted by Western specialists from a variety of sources, such as speeches of government officials, infrequent publications of planned data in physical units, state budgetary releases, technical industrial periodicals, meager diplomatic and intelligence reports, and a variety of secondary sources of varying or unverifiable reliability.
In the late 1940s and early 1950s, a group of Western, mainly U.S., scholars (Abram Bergson, Collin Clark, Alexander Gerschenkron, Gregory Grossman, Leon Herman, Naum Jasny, Stuart Rice, Lynn Turgeon, Harry Schwartz, and others) analyzed and examined Soviet economic statistics available at the time in a series of seminars, studies, and conferences. The near-consensus which emerged at that time can be briefly summarized as follows:

**Question of Falsification**

Soviet official statistics do not intentionally lie. That is, it was ascertained that TsSU (The Central Statistical Administration) does not routinely doctor or falsify published statistics for propaganda effects. Therefore, the old “two-sets-of-books” theory was discarded to be replaced by what may be termed the “Iceberg” theory. According to the new understanding, the Soviet state statistical system produces only one set of economic data, but a large share of these data is kept secret and is accessible only to the leadership. Only a small part, “the tip of the iceberg,” is available in the open literature. Criteria for removal of data from the public domain changed over time, but the dominant reasons were the desire to conceal information that would present the Soviet economy in an unfavorable light, expose adverse changes in peoples’ welfare, or reveal certain aspects of the industrial and defense potential.

One note of caution has to be added, however. The Soviet system was and is a high pressure one that bestows significant rewards to economic agents for effective performance and metes out severe penalties for failures. Thus, falsification at the enterprise level has always been attractive to managers who wanted to inflate their successes and understate or hide their failings. TsSU has the responsibility for auditing all reported statistics, catching and correcting all distortions, and has a large staff of inspectors to do it. All the available evidence indicates, however, that they never succeeded in eliminating the practice of falsification at lower levels. To what extent these distortions at lower levels carry through to and affect aggregate national data is difficult to say. There is yet another defect of Soviet

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1. The interest in Soviet economic data is illustrated by the fact that the November issues of the leading American statistical journal, *The Review of Economic Statistics*, published six articles on this issue (see, for example, Gerschenkron, 1947, pp. 217-225). An important aid in these studies was the secret Soviet 1941 State Economic Plan, which was captured by Germans at the beginning of the war and found at the end of the war by the U.S. Army in Germany. Presumably a part of the “first set of books,” it enabled the scholars to compare several statistics found in the Plan with comparable data that were available in the Soviet open literature. A careful analysis revealed no serious discrepancies between the secret and open sets of data.

2. Alec Nove suggested that the effects of a “law of equal cheating” leave rates of growth of national income and of other aggregate output series unaffected. In all probability, the share of falsely reported output in total production is relatively stable over time. Hence, while annual data may be overstated, rates of growth would not be (Nove, 1969, p. 348).
statistics, termed "descriptive distortions" by Professor Gregory Grossman (Grossman, 1960). In a comprehensive analysis of Soviet statistics he observed that although data series in physical terms may be accurate, an inexperienced analyst, Soviet or Western, may be misled by subtle (and often not explicitly stated) caveats or exclusions in the definition and classification of the data. Thus, the tabulated Soviet data may in reality be somewhat different from what they, at first glance, appear. For example, grain output is reported in "bunker weight," as collected by harvesting combines, which means it is overstated because of the presence of dirt, moisture, and other foreign matters. Consumption of meat in the USSR is reported in kilograms per capita and includes lard, bones, and substandard meat cuts that are not counted in similar data by other countries. Or, to give a more recent example, the coverage of sales of passenger automobiles to private owners was changed by TsSU in the early 1970s to include the turnover of used cars, but the readers of statistical compendia were not told of the change. Thus, the published total labeled "cars sold," which readers would assume meant new cars, was inflated by multiple counting.

In some instances exact definitions and explanations of the series were made available in small print, but more often than not "descriptive distortions" were not immediately obvious and would take time-consuming detective work to unravel.

Different Levels of Reliability

Western scholars distinguished among several types of published Soviet statistical data in terms of their reliability and usability:

a. Data reported in physical units (i.e., tons, meters, liters) were deemed to be the most reliable and usable. On the other hand, it is with the data in physical units that we find most cases of withholding unfavorable statistics from the open literature.

b. Data in value terms, while not directly manipulated by Soviet statisticians, were considered far less reliable and less usable because of inherent shortcomings of the Soviet price system. Micro data (i.e., individual or group values in rubles) were often distorted by turnover taxes and hidden subsidies. National aggregate data in current prices (National Income or Net Material Product, Gross Social Product, Gross Industrial Product) suffered from numerous methodological and classificational defects. When transformed into constant ruble series these defects were compounded by biased price deflators.3

3See Becker, 1972; Cohn, 1972; and Greenslade, 1972. The fact that critical observations and comments contained in these studies written some twenty years ago are still essentially relevant testifies to the lack of progress in the methodology of construction of aggregate series in Soviet statistics.
c. The least reliable and usable data were found to be Soviet indexes (output, price, sales, national income, standards of living, industrial gross product, and the like) because of the use of archaic and often biased formulas often coupled with outdated methodology, and inconsistent classifications.

Recognition of these shortcomings, biases, and blank spots in Soviet economic statistics made it necessary for Western scholars to fill in blanks and to correct, adjust, and reconstruct Soviet series.

CHANGES IN WESTERN VIEWS OF SOVIET STATISTICS

The evaluation of reliability and usability of Soviet statistics by Western specialists remained essentially unaltered for the next 30-35 years, with notable exceptions.

For many years Western specialists believed that TsSU had a complete monopoly on statistics on the USSR, but it turned out not to be the case. In fact, five agencies\textsuperscript{4} had shared the control over statistics: the Ministry of Foreign Trade had the responsibility for decisions relating to collecting, processing, and publishing foreign trade data; the Ministry of Finance had a similar responsibility for financial, monetary, budgetary, and credit data; the Ministry of Internal Affairs was responsible for the so-called "moral and social statistics," i.e., crime, alcohol and drug abuse, prostitution, and other forms of deviant behavior, and for data on law enforcement; and the Ministry of Defense controlled all data covering defense activities and military production. TsSU was responsible for the remaining economic and demographic data. These five agencies had complete and unchallenged control over all statistical data collected and published in the USSR. Glavlit, the state censorship organization, saw to it that no other state agency, research organization, or academic scholar would be allowed to publish any statistical data not originating with these agencies, or even to comment on or criticize the data published by them. This compartmentalization of data flows, coupled with the Soviet predilection for secrecy, impaired the overall availability of information to the government and the public. The Ministry of Foreign Trade and the Ministry of Finance published their own statistical compendia, and TsSU published smaller compilations of data from these sources, data that were in some instances inconsistent with

\textsuperscript{4}The role of the State Planning Committee, Gosplan, in the overall system of state statistics in the USSR is still not clear and needs further investigation. In terms of prestige and status, Gosplan clearly outranks TsSU and Finance, Internal Affairs and Foreign Trade ministries, and would presumably have access to their information. In fact, Gosplan needs access to all ex-post statistics for the purposes of plan preparation. What we do not know is to what extent Gosplan was willing to accept the data generated in other statistical agencies and whether it had to resort to its own data collection. In private conversations with foreign scholars Gosplan officials were often highly critical of the accuracy of TsSU data.
TsSU methodology, but over which TsSU had no control. The Ministry of Internal Affairs, which took over the responsibility for "moral and social" statistics in the early 1930s, did not share their data with TsSU at all. And, it is not surprising that whatever statistical data were collected and processed by the Ministry of Defense were never turned over to TsSU. For example, several official editions of the history of World War II, published under the auspices of the Ministry of Defense, contain a number of interesting and important economic series for the 1941-1944 period, such as national income, consumption, retail trade, industrial and agricultural output indexes, and the like (Pospelov et al., 1970, p. 569). To the best of my knowledge, none of TsSU or Goskomstat publications, including several anniversary editions that emphasized historical statistics, ever reprinted these indexes, leaving the war period blank. These puzzling gaps in TsSU statistics suggest that there is no formal exchange of data, or even close coordination, between the two agencies.

Needless to say, TsSU must have obtained some data from these ministries for the construction of aggregate series (Net Material Product, Gross Social Product, and the like). From what we know about the relations among these agencies we can assume that TsSU had no control over the methodology, classification, scope, deflators, and other aspects of the series turned over to them, which compounds the known shortcomings of aggregate data.

Another change in the earlier Western assessment of the Soviet statistical system that emerged in the 1970s was a gradual realization that the hidden part of the "iceberg" was neither very large, nor well organized, nor accurate. We have learned that statistical series that disappeared from print in the 1930s, such as price and cost-of-living indexes, series on industrial accidents, residential housing, and a number of others, were not withdrawn from the open literature but were simply discontinued. Many other series and sets of economic, social, and demographic data routinely collected by all advanced industrial nations in the world are not available in the USSR even at a classified level. For example, recent discussions in the Soviet media by statisticians, demographers, and retired high-ranking military commanders concerning human casualties of World War II leave no doubt that accurate records of losses—classified or not—were not kept and are essentially unknown.

5For example, according to the classification employed by the Ministry of Foreign Trade, arms and weapons, consumer durables, appliances, and ship repair are not classified as machinery products as they are under the general TsSU classification. As a result, the structure of foreign trade obtained by Goskomstat from the Ministry of Foreign Trade and published in annual compendia shows a machinery category that is not comparable to machinery data reported in standard TsSU tables. There are other, albeit minor, classificational discrepancies. It appears that the TsSU had no authority to correct the data given to them by the Ministry of Foreign Trade.

6I found one exception—an early industry statistics compendia gave the industrial output index for 1944 (PROMYSHLENOST, 1964, p. 32).

7Stalin reported in 1946 that the USSR lost seven million lives in World War II. Later Khroushchev increased this figure to "over twenty million," presumably including both military and civilian casualties. In 1988, the well-known demographer, Kvasha, estimated direct war losses at about
There are many other reasons to suggest that the hidden part of the "iceberg," both in terms of quantity and accuracy of statistics, was unimpressive.

UTILITY OF OFFICIAL STATISTICS FROM AN INTERNAL POINT OF VIEW—A NEW QUESTION

A broader and highly speculative question should be posed at this point. Western specialists focused their research primarily on issues of the usability and credibility of Soviet economic statistics from the perspective of Western analysts. The issue of economic information flowing within the Soviet system was not addressed by these specialists directly because of the inability to evaluate the accuracy of the hidden part of the "iceberg." It was thus assumed that the secreted data were abundant, comprehensive, and accurate, and that the Soviet leadership always had access to timely and reliable information. At the present time, this assumption must be reappraised. To what extent did the manipulation of data (willful or inadvertent), propaganda distortions, and the bureaucratic aversion to explore unfavorable developments and phenomena practiced by TsSU (and probably other agencies) influence key Soviet policymakers? We cannot fully answer this question, but it would be instructive to look at some evidence.

The first case to consider is that of the preparations of the economic part of the 1961 Communist Party of the Soviet Union. The Program was utterly unrealistic in projecting extremely high rates of economic growth and in predicting that within ten years the USSR would exceed the United States in per capita production; within twenty years the basis of Communism was confidently expected to be built in the USSR (KPSS V RESHENIYAKH, 1972, pp. 196-305). At the time, most Western specialists dismissed these projections as one of Nikita Khrushchev's characteristic unsubstantiated boasts. Now we learn from reminiscences of Alexeev, one of the chief economists responsible for the economic part of the Program, that projections were the product of careful analysis and extrapolation from official statistical data supplied by TsSU made by a group of economists working for the Central Committee. The projections were reportedly taken quite seriously by Khrushchev and others in the Politburo and incorporated in the Party Program (Alexeev, 1989, p. 6 and pp. 30-31). It would be reasonable to speculate that in this and probably other cases Khrushchev's domestic and foreign policies were influenced by the unrealistically favorable picture of Soviet economic reality.

twenty-seven million (1988, p. 3). Discussing this issue one year later, three retired military commanders disagreed among themselves: Marshall Ogarkov said that twenty million was more or less correct, General Lyashchenko stated that the true figure should be higher, and General Shikadov felt that the question requires more study (Afanas'yev, 1989, pp. 14-15.)
Remarkable progress was recorded in the availability of economic statistics in the 1960s and early 1970s. During these years general compendia, such as NARODNOYE KHOZIAYSTVO, published more and more data, and began supplying detailed methodological notes; specialized handbooks on agriculture, labor, capital investment, industry, transportation, and retail trade, appeared. Deception and the denial of vital information to central authorities continued in post-Khrushchev years. A sharp turning point in the availability of economic and demographic statistics occurred in the mid-1970s, and it is still not clear what caused it. Publication of specialized handbooks had ceased completely, the volume of data available in general compendia was cut year after year, and "descriptive distortions" multiplied. During the remaining years of the Brezhnev era, official Soviet statistics concealed the slow malaise affecting the economy. Information showing the economy in poor light or indicating deterioration in welfare indexes were routinely suppressed. Methodological shortcomings and the absence of reliable deflators led to overstated rates of growth of national income and product, industrial output, and labor productivity. TsSU concealed, and often suppressed, or in many instances simply neglected to investigate and quantify, numerous adverse developments in what can be broadly called "quality of life," such as increasing growing morbidity, unemployment, and, what should have been particularly alarming, the decreasing life expectancy of the population at birth (Feshbach, 1985, pp. 41-53). The evidence of the growth of alcohol and narcotics abuse, the spread of prostitution and venereal disease, increase of abortions, and the like, were either undetected or suppressed.

The state statistical system failed to recognize, quantify and report several major phenomena that had a significant impact on the economy. The emergence and rapid growth of the so-called "second" or underground economy and the concomitant corruption and graft of bureaucracies was not recognized or investigated. Rapid environmental deterioration such

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8Among new sets of data we should mention construction of input-output tables for 1959, 1966, and 1972. The tables were released in a truncated format with some major parts missing but their publication was nevertheless a major breakthrough in availability of integrated and consistent micro information for the Soviet economy.

9Major series, such as output of grain and production of several types of machinery including trucks, which had been published since the mid-1960s, disappeared from print in the early 1980s. Grain statistics were restored later.

10See Grossman, 1987, pp. 213-228. The observation that the mushrooming "second economy" remained unrecognized and unstudied by the Soviet government was made by the Minister of Internal Affairs at the Second Congress of Peoples' Deputies (Bakatin, 1989, p. 2). The Minister said that estimates made by individual scholars placed the annual turnover of the "second economy" in the range between 70 and 90 billion rubles and that it was expected to grow within the next few years to 100-130 billion rubles. It should be noted that these figures are fairly close to the preliminary estimates made by Grossman and the author. In contrast, Goskonstat reported that in 1986 "unearned income," that is, the principle component of the "second economy," was equal to only 5.1 billion rubles (SOTSIALNOYE RAZVITIYE, 1986, p. 99). About a year later "unearned income" was already reported as 56.5 billion rubles (SOTSIALNOYE RAZVITIYE, 1990, p. 121).
as air and water pollution, contamination of soil by excessive use of pesticides and low quality fertilizer, and soil erosion, also remained essentially undetected and unreported until the early 1980s.11

The absence of a comprehensive picture of the level and impact of defense expenditures is another case in point. The economic burden of defense and the “cost of Soviet empire” were growing rapidly in the 1970s (Epstein, 1990, pp. 127-154; Wolf et al., 1986.) As discussed below, we are now just beginning to gain insights into Soviet methods of measuring and accounting of defense expenditures. But the overall picture that is gradually emerging from Soviet publications and debates in the media and the Supreme Soviet strongly suggests that defense costs, particularly costs of production of arms and weapons and of general-purpose materials supplied to the military, were consistently understated by hidden subsidies and price distortions. No comprehensive budgetary accounts or statistical series (either in current or constant prices) were made available to decisionmakers.

It is, of course, impossible to say whether Brezhnev’s leadership would have pursued different policies had the state statistical system presented a more accurate and comprehensive picture of the Soviet economy, sounded the alarm about the rapid growth of the “second economy,” highlighted the increasing defense burden, or disclosed environmental deterioration. But the absence of unbiased information on the deterioration of the quality of life and on other adverse economic developments clearly contributed to the complacency shown by central authorities and by the general public during the so-called “stagnation period” of Brezhnev’s years.

During the short administration of Yuri Andropov and in the first two years after Mikhail Gorbachev ascended to the position of the general secretary, TsSU continued “business as usual.” The overall picture of the Soviet economy, its growth potential, and the welfare of the Soviet people as seen through the eyes of TsSU in the mid-1980s, were unrealistically pleasing; this must have misled the new government and influenced early policies. Gorbachev stated this clearly at the 19th Party Conference when he said that “we did not realize the depth and the burden of deformations and stagnation of past years . . . Only now do we see that the neglect in economics was much more serious than envisaged earlier” (Gorbachev, 1988, pp. 6-7).12 Maybe the design for perestroika or the timing of

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11According to a “samizdat” report by a Soviet specialist, some concern with the state of the environment was expressed in classified Gosplan documents in the 1970s, but these were not shared with other government agencies and no quantitative information was released by TsSU (Komarov, 1982). In 1986, the annual statistical handbook NARODNOYE KHOZIYAYSTVO was expanded to include a section on environment. The few simple statistics published at the time concealed the degree of environmental disruptions.

12One of the more astute Soviet economists, Tatiana Kuryagina, presents the same case in a more dramatic manner: “By far, not all economic and social problems were recognized at the start of
reforms would have been different had the leadership had a more comprehensive and trustworthy picture of the economy when Gorbachev became General Secretary.

Clearly, the history of Soviet policymaking and the information made available to policymakers requires much more study. But as a speculative conclusion we may say that shortcomings, biases, deceptions, propaganda-dictated distortions, and gaps found in official statistics, ultimately deceived key Soviet decisionmakers and adversely influenced policy.

**PERESTROIKA AND STATISTICS**

The statistical system proved to be more resilient to changes introduced by Gorbachev than many other Soviet institutions (Treml, 1988, pp. 65-94). The need to improve the availability and the reliability of statistics and, generally, the need for fundamental changes in the whole statistical system was not recognized by TsSU authorities. One year after Gorbachev became General Secretary, TsSU was not even considering publishing previously suppressed statistics.\(^\text{13}\)

The pressure to reform the statistical system came from without and above.

The first important sign of progress was the erosion of Goskomstat's complete monopoly on the publication of data. In the atmosphere of "glasnost" this total monopoly has cracked, and economists and statisticians outside of the state statistical system, as well as journalists and social commentators, gradually began reviewing, commenting, and criticizing official statistics, and presenting independently collected or estimated series not available in official sources. One of the first such publications was Selyunin and Khanin's lengthy study in NOVYI MIR criticizing the biased nature of official growth statistics and offering an alternative with much lower indexes.\(^\text{14}\) The number of critical attacks on official statistics—ranging from a few disparaging references by journalists to full-length studies by prominent scholars—increased rapidly.

It is surprising to note that, neither the criticism voiced by the leadership nor the attack by Selyunin, Khanin, and others had much effect on TsSU. In the spring of 1987, the head of TsSU, Mikhail Korolev, reported to a special conference of TsSU on the tasks of statistics under perestroika. His speech and other statements made at the conference indicate that TsSU leadership did not take the mounting criticism seriously. Apparently they

\(^{13}\) For example, the Head of TsSU, Mikhail Korolev's only reference to a possible release of more economic statistics in 1986 was a promise "to discuss the issue of accessibility of statistical information to a wider circle of specialists" (Markovich, 1986, p. 64).

felt that the release of a few formerly suppressed statistical series, some cosmetic changes in the format of published handbooks, and repeated exhortations to the cadres to improve their efficiency would be sufficient to satisfy the reformers. The pressure from above, however, continued to mount. The Politburo stressed the need for radical improvement in state statistics in April 1987, emphasizing that the policy of glasnost should be applied to the state statistical system. In July the Central Committee passed a resolution demanding radical changes in the state statistical system and reorganizing TsSU into the more prestigious State Committee on Statistics, or Goskomstat. The new 1986 statistical yearbook, which was apparently ready for printing in the early summer, was held up, and several sets of long-suppressed data were added to it. Thus, things were finally changing, particularly the availability of statistical data in the open literature. Starting with NARODNOYE KHOZYAYSTVO SSSR published in late 1988 and in the newly established periodic press releases and presse bulletins, Goskomstat resumed reporting data that disappeared in the 1970s. It began publishing statistical series that have not been available in the open literature since the early 1930s. A total of 22 specialized statistical compendia covering labor, consumer trade, industry, state supplies, agriculture, technological progress, social issues, environmental protection, health, and others were published in the next two years. The expanding statistical publications also show a measure of qualitative improvement—methodological notes have become more comprehensive, endless repetitions of similar tables with different base years were reduced, the size of the household budget survey sample was increased from 60,000 to 90,000 families, and one-time sample surveys on a variety of subjects became more frequent. The improvements in the scope and coverage of published statistics were, however, not uniform. For example, data on the production of some machinery, such as trucks and railroad rolling stock, which disappeared from print in the early 1980s, are still not available. The coverage of series on unfinished construction and state inventories was completely changed, making them incomparable with earlier series. Industrial wholesale price indexes, which disappeared from publication in the early 1980s, have not been restored.

Manipulation of data continued well into the late 1980s. According to Vadim Kirichenko (who replaced Korolev as the Head of Goskomstat in 1989), the rates of growth of national income, gross social product, and indexes of peoples’ real income for 1985 and 1986 have been artificially almost doubled by removing the effects of lowered production and sales of alcoholic beverages resulting from Gorbachev’s 1985 anti-drinking campaign. The rates of

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10 The elevation of TsSU to the level of a state committee was apparently done to strengthen their position with respect to other ministries.
growth of national income reported at the time as 3.5 percent in 1985 and 4.1 percent in 1986 were in fact, 1.6 and 2.3 percent respectively. The most remarkable aspect of this is that these blatant falsifications of basic indexes took place as late as 1987, at the time when glasnost was already declared to be the core of perestroika policies. This raises an important question—did Gorbachev, or those close to him, know of these falsifications? Or did Goskomstat officials continue the traditional practice of falsifying data to please the leadership? These questions must remain open.

The removal of the secrecy stamp from a number of data series and the rapid growth of statistical publications is, needless to say, a welcome sign. One should not, however, view it as a particularly remarkable achievement of Goskomstat. There is a great deal of overlap in the data published in the new 22 specialized statistical compendia. Most of the new compendia, such as those covering industry, labor, consumer trade, and the like, were periodically compiled and published for internal use only, and thus the basic series and tables were always available in classified storage at Goskomstat, needing only to be checked over, rearranged, and sent to the printers for open publication.

Another sign of progress was seen in the partial reorganization of responsibilities for different types of statistics among the five state agencies mentioned above. The Central Committee resolution specifically provided for “centralization of all foreign trade statistics” and stressed the need to develop “social” statistics within Goskomstat (O KORENNOY, 1987, p. 183). Three years later foreign trade statistics were still processed and published under the auspices of the Ministry of Foreign Trade, but it appears that the transfer to Goskomstat will take place. Goskomstat has also released some foreign trade data that had not been made public earlier by the Ministry. Goskomstat was successful in expanding collection and publication of “moral and social” statistics, something had not been done since the late 1920s. The MVD continues to release crime data in periodic press bulletins, but Goskomstat publications now offer several important series on crime and other forms of deviant behavior. The budgetary, monetary, and banking statistics, however, have remained with the Ministry of Finance and the Gosbank, and Goskomstat compendia continue to reprint meager data given to them.

A special case is that of information and statistics on Soviet defense expenditures and other matters related to the Soviet military posture. Since 1988, the veil of secrecy over

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Krichenko, 1990, p. 22. This manipulation of the data was earlier reported by two Soviet economists outside of the state statistical system (Volkov and Samokhvalov, 1989, pp. 22-23). It appears that in order to boost the rates, Goskomstat removed national income produced in the alcohol industry from 1984, 1985, and 1986 national income aggregates (including republican national income figures) and alcohol sales from basic data underlying computations of real income indexes. Because production and sales of alcoholic beverages fell sharply in 1985 and 1986, this adjustment increased sharply the rates of growth.
defense has been gradually lifting, but Goskomstat's role in this development has been, until recently, minimal. But I would like to bring it up here because it bears on one of the main themes of this paper—the examination of the accessibility of accurate economic information to Soviet leadership. Even a brief survey and analysis of emerging information on Soviet defense would take too much space, so I will restrict it to a brief summary.

In the summer of 1988, Gorbachev said in an address to the United Nations that the USSR was prepared to reveal the size of the defense budget. Using the same forum, the Deputy Minister of Foreign Affairs, Petrovsky, reported that the total defense figure published in annual Soviet state budgets covers only military pay and maintenance and that military R&D, procurement, and other major elements of military spending were concealed under other (unspecified) budgetary categories. Petrovsky said that the true size of the defense budget would be revealed after completion of the planned price reform in the USSR. The explanation given for the expected delay, officially and in private, was that prices in the defense sector, particularly prices of arms and weapons, have been out of line with other prices of durables in the USSR. Thus, publication of current defense figures would not be helpful, because they could not be related to other economic magnitudes. The price reform has been postponed several times but, nonetheless, in May of 1989 Gorbachev speaking at the Congress of People's Deputies, revealed the absolute figure of 1989 Soviet defense expenditures as 77.3 billion rubles, almost four times higher than officially reported earlier. More detailed information on major components of defense expenditures followed. Some of the revealed figures, particularly the 32.6 billion ruble cost of procurement of arms and weapons, appeared to be too low to Western intelligence and military specialists. A reasonable explanation, supported by new evidence, is that prices in the defense sector have been too low because of direct and indirect subsidies, distorted prices of inputs, and such factors as extremely low, or even negative, profit margins in the defense sector. References to understated defense prices and to the general ignorance of the true cost of defense began to appear in the media.17 A figure as high as 200 billion rubles was mentioned during the budgetary debate in the Supreme Soviet (Ryzhkov, 1990, p. 27). It appears that the Soviet government has no comprehensive document that could be termed a “defense budget,” and the various detailed military expenditure summaries are inconsistent and not comparable with other ruble magnitudes. Whatever documents and accounts the Ministry of Defense has are not released to other government agencies. In the summer of 1990 a team of economists created by a joint decision of Yeltsin and Gorbachev and headed by S. Shatalin, a member of

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17 A group of seven economists published an open letter “The Mystery of Military Expenditures,” stating that the published defense expenditures grossly underestimate the true costs of the Soviet military effort (Belkin et al., 1990, pp. 9-10). See also Kondrashov, 1989, pp. 204-208.
the Presidential Council, was working on the “Five-hundred-day Program of Transition to a Market Economy.” According to the final Shatalin document, the Ministry of Defense (and some other state agencies) did not furnish the team with any of the requested data (PEREKHOD, 1990, p. 192). Incredible as it seems, more and more evidence points to the fact that in the area of defense expenditures, as in many other areas, the Soviet leadership operated for years and continues to operate in the dark, without a solid database.

Very little has been said concerning defense costs in the hundreds of new statistical series published by Goskomstat since 1987. What new defense data did appear in official publications were simply restatements of information released earlier by Gorbachev and other leaders.18 But things appear to be slowly changing, even in this sensitive area. In May of 1989 Goskomstat published detailed data on the production of civilian goods by defense ministries (VESTNIK STATISTIKI, # 5, 1989, pp. 72-73); in January of 1990 it released the already-known figure on the personnel strength of military forces (PRAVDA, January 28, 1990, p. 1). Particularly interesting, because it was probably done without Ministry of Defense approval, was the Goskomstat publication of a small version of the 1988 input-output table, from which it is relatively easy to extract the ruble values and the distribution of the costs of stockpiling by the military as well as the figure on export of arms and weapons in domestic prices (OTCHETNYI, 1990; Treml, 1989).

Unfortunately, as discussed in the next section, there has been far less noticeable progress in the area of statistical methodology, collection techniques, improved definitions, and, generally, in the quality and reliability of state statistics.

REFORM DESIDERATA

Timeliness

As perestroika has progressed, enterprises and organizations have gained more autonomy, and their need for timely and detailed statistics has grown. Autonomy, however, means little in an economic environment in which current and accurate information is not widely available. At the present time, however, little or no published statistics are of operational utility to enterprise management. Most statistics published by Goskomstat in annual compendia and press releases cover annual data. In addition, selected aggregate data are published in quarterly plan fulfillment reports. The coverage of the latter, however, varies, and an index or a measure reported for the first quarter of the given year may not be reported in the second quarter. Statistical agencies of most industrial nations in the world

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18 In 1989 Goskomstat continued to follow the pattern set by the Ministry of Finance and reported defense expenditures in tables on the state budget as 20.2 billion rubles with a footnote stating that total 1989 defense expenditures amounted to 77.3 billion rubles.
release many statistical indicators on a weekly and monthly basis, and that is clearly what is needed in the USSR today. Many of the current statistics published at frequent intervals must also be made available in a seasonally adjusted form\textsuperscript{19} to be operationally meaningful. Unfortunately, there is no evidence that Goskomstat is yet prepared to start processing and releasing such operational statistics. This could become a serious obstacle in the development of enterprise autonomy and in attracting Western entrepreneurs to joint ventures with the USSR.

**Conflicting Functions**

Unlike most other state statistical agencies in the world, which primarily collect and process national statistics, Goskomstat performs two distinctly different functions for the Soviet government. The first is the basic task of collecting, processing, and publishing statistical data for government and general users. The second function is to serve as a central record-keeping organization responsible for the accuracy of the data obtained from enterprises and organizations, including the authority to audit suspect reporting units.

This second function determines certain aspects of, and even interferes with, the first function of statistical collection of Goskomstat. For example, the predilection for total coverage in collection of data over sampling techniques is directly related to the auditing function. Goskomstat's perennial concern with the possibility of willful distortion and falsifications on the part of reporting units is legitimate if the auditing function is to be considered. On the other hand, were Goskomstat simply a state agency collecting, processing, and analyzing national statistics, the entire issue of distortions would become irrelevant. Such an agency, relying primarily on random sampling (including one-time surveys) and properly designed sampling techniques, would significantly reduce the possibility of obtaining distorted data. Other aspects of the state statistical system—such as the emphasis on production at the expense of consumption, neglect of such aggregate statistics as national income and product, and lack of interest in preparation of data by economic regions in contrast to republican or oblast divisions—can be explained also by the requirements of Goskomstat's auditing responsibility. No matter what the advantages, the present Goskomstat bureaucracy is not likely to support willingly a transfer of the auditing function to a different state agency, because such a shift would reduce their prestige and status.

\textsuperscript{19}{For example, national income, retail, and wholesale trade sales, production of certain goods and services, freight, inventories at the level of producers and distributors, employment and unemployment, price indexes, foreign exchange rates, interest rates, and money supply data should be available on a seasonally adjusted basis.}
Historical Series

Goskomstat has been rapidly expanding the coverage of economic data not published before. However, most of new data cover the last few years, or at best go back to 1980. Data series covering longer periods of time are absolutely necessary for any serious economic analysis of trends, for model building, and for reappraisal of the Soviet economic growth experience. The newly released data on crime and other forms of deviant behavior, while obviously welcomed by specialists, have little analytical value since they are available for only 5 or 6 years. Soviet demographers and historians are engaged in extensive debates concerning such historical facts as the population losses of the USSR in World War II, the impact of collectivization, the importance of the suppressed 1937 and 1939 population censuses, and trends in birth and death and other vital rates in the period between the early 1930s and the late 1950s; but Goskomstat, which should have the final say in these matters, remains silent.

Foreign Trade Statistics

For many years the only data on commodity exports and imports available in the USSR were detailed series prepared by the Ministry of Foreign Trade. The series were constructed in physical units and in so-called “valuta rubles,” i.e., foreign prices converted to rubles by means of state-fixed foreign exchange rates. The “valuta” prices correspond to the actual ruble prices received by Soviet exporting enterprises or paid by final domestic buyers of imported goods. No serious analysis of effectiveness of foreign trade, profitability of specific foreign trade transaction, or the structure of national income is, of course, possible without these internal ruble prices.\(^{20}\)

Price Statistics

These are, of course, among the most important areas, where both improvements in the existing indexes and preparation of new indexes might have been expected. Regularly published official industrial and consumer retail price indexes are faulty to the point of being almost useless in the opinion of most Soviet and Western authors. Price deflators for gross social product, national income, construction, investment, exports and imports, consumer services, agricultural products, state budgetary categories, transportation and other services

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\(^{20}\) It should be noted that sets of conversion coefficients from “valuta” to domestic prices are available for internal use but these coefficients are of questionable accuracy. Goskomstat is using some global conversion factors to obtain commodity foreign trade balance for purposes of national income accounting, but both the formula and the methodology have several shortcomings. The long-established convention of valuing exports in domestic enterprise prices (without turnover tax) and imports in final purchasers’ prices, which include turnover taxes, is one of many distortions.
are not available in the open literature, and some of these are not regularly prepared even for internal use.

A review of all articles and reports dealing with TsSU and Goskomstat's work agenda published in VESTNIK STATISTIKI yielded surprisingly few references to plans to study prices, relations between prices and labor incentives, and relations between prices and productivity of new machinery.

**National Income Accounts**

In overall terms, national income accounts remain the weakest part of aggregate Soviet statistics. Published breakdowns by a small number of categories clearly are not sufficient for analytical or planning purposes. There are some design faults, such as placement of all turnover tax earnings in industry, which distort the true structure of national income. The methodology of recomputing National Income (Net Material Product) in constant prices has serious shortcomings which reduce the reliability of the official series.

One problem with the method of deflation of national income is that it generates different rates of growth for national income produced and used. Annual differences between the two growth rates are in the range of 0.5 to 1.5 percent and, for the entire 1960-1987 period for which the data are available, the differences between the two series amount to 56 percent. Because the difference always has the same sign, one must conclude that the method used in the deflation has a built-in bias. The problem of estimating NMP growth is compounded by a bizarre choice of base years for the different components of the NMP produced and NMP used.

There is one sign of progress in this area. In 1988, Goskomstat began to prepare current and constant-price measures of Soviet Gross National Product (GNP) following Western conventions, which was never before done in the USSR. Measures of Soviet GNP will now become a standard part of the Goskomstat aggregate national data menu. One suspects, however, that the methodological shortcomings of NMP accounts have been transferred to GNP calculations, and much more work remains to be done in this area.

**New Series and Statistical Concepts**

Monetary and banking statistics remain a major gap in Soviet statistics that needs to be filled. Data on the gold reserve, supply of money in circulation, measures of the velocity of circulation of money, assets (reserves), and liabilities of banks, and similar financial statistics are absolutely essential to facilitate reforms in the Soviet monetary and banking system. Some of these data are still controlled by the Ministry of Finance but Goskomstat would need to develop new series.
The developing sphere of economic activities of private cooperatives and individuals has not been fully reflected in statistical publications. Simple enumeration of existing cooperatives and their functions as now done is not enough, and Goskomstat has to address the difficult issues of how to measure the relations between the state and the growing private sector. The phenomenon of the "second" economy needs quantification, and Goskomstat has to develop a special methodology for measuring and integrating hidden private economic activities with national income accounts.

In fact, some of these issues go beyond statistics. Western businesspersons and more astute Soviet observers note that the existing Soviet system of bookkeeping and accounting is archaic and needs a thorough revision before it meets the needs of a modern autonomous enterprise.

Last, we should note that in the past, Goskomstat organized all relevant statistics on the basis of republics, avoiding and neglecting differentiation by nationality and ethnicity (with the exception of educational status data collected in population censuses). But a number of economic and social problems and developments simply cannot be properly studied without statistics broken down by nationality. Vital demographic statistics, wages, personal money income, employment, labor productivity, and consumption of alcohol are just a few examples of these absolutely essential data. It is obviously a politically sensitive and difficult issue, but it cannot be avoided in an open society.

CONCLUSIONS

Western specialists have achieved a certain measure of success in interpreting published Soviet statistics, filling in gaps in methodologies and classifications, correcting many shortcomings, and estimating and reconstructing unavailable or suspect data. This is recognized not only by scholars and government agencies in the West but by Soviet specialists as well.

An interesting phenomenon—one that is probably unique in the history of world state statistical systems—has thus emerged. Officially, Soviet authorities have long rejected Western studies of their economy as biased and politically motivated. At the same time, many Soviet scholars, government economists, and even state statisticians, were aware of gaps in and the general paucity of officially published data, faulty and archaic methodologies, inconsistent classifications, and biased indexes. But in the past the monopoly position of TsSU was so strong that these scholars did not dare challenge the official figures by making their own alternative estimates. Because of this, they developed a keen interest in estimates, adjusted series, and re-computations of various statistical series for the Soviet economy made
by Western specialists and were, in many instances, prepared to accept them as more accurate than the official TaSU data.

On some occasions Western estimates have, in fact, been used by Soviet statisticians as a standard against which official Soviet data could be evaluated. 21

In the spring of 1988 authorities canceled high school final examinations in Soviet history courses. The reason given was that old textbooks were full of distortions, blank spots, and misinterpretations, and students should not be required to use them. In some sense the Soviet society suddenly found itself left without history. In this regard the world outside the USSR was always in a somewhat better position: Western scholarly sources on the Soviet economy, history, politics, and demography may have been of varying quality, but, by and large, they offered more balanced and accurate description and analysis than most Soviet documents and monographs. This seems to be particularly true with respect to economic statistics. How soon would the Soviet society overcome the decades of neglect and distortions is difficult to say.

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21 One example should illustrate this. The chairman of Goskomstat attempted to defend price indexes prepared by his organization from mounting attacks by critics. His main argument, somewhat surprisingly, turned out to be that Goskomstat's price indexes were fairly close to price indexes estimated by the Central Intelligence Agency and hence must be accurate (Korolev, 1969, p. 2).
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7. THE changing priority of the SOVIET defense sector, 1985-1990

Christopher Davis

INTRODUCTION

In the traditional Soviet Union the defense sector had a high priority status that was reflected in economic plans at the macro level through generous allocations of resources, in the national security strategy through emphasis on the development of military power over threat reduction measures, and in mechanisms at the micro level that protected defense institutions from the adverse consequences of chronic disequilibria in markets and shortages of commodities. During 1965-85 this preferential treatment contributed to the improvement in the technological sophistication of Soviet weapons systems, the increase in the quantity of defense industry output, and the enhancement of the military power of the armed forces. However, it also resulted in a heavy defense burden that undermined the performance of the civilian economy and contributed to the relative decline in the power status of the USSR.\(^1\)

Furthermore, in the Brezhnevite stagnation period the effectiveness of priority protection mechanisms was eroded by social, political, and economic forces, and therefore the costs of attaining defense objectives rose substantially.

The Gorbachev regime has adopted radically different economic and security concepts and policies. Although the initial economic reform policies were timid and ineffectual, by October 1990 even the official policy, as elaborated by President Gorbachev in his economic program, called for a shift to a market economy with various forms of ownership, minimal political interference in economic processes, abolition of central rationing of producer goods in favor of wholesale markets, introduction of more flexible prices, and decentralization of decisionmaking (Gorbachev, 1990). In the security sphere, the “new thinking” of the Gorbachev regime has generated policies that have resulted in unilateral cuts in the armed forces, multilateral arms control agreements, the adoption of a program for the large-scale

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\(^1\) The decline of the Soviet Union as a Great Power is analyzed in Kennedy (1988) and Davis (1990a).
conversion of defense industry to civilian production, military disengagement from Afghanistan and significant withdrawals of troops stationed abroad, the collapse of the communist systems in Eastern Europe, and the disintegration of the Warsaw Pact.

In this paper an attempt is made to assess the extent of reform-related priority shifts and their actual effects on the defense sector at the three levels mentioned above. The paper first reviews the traditional relationship in the USSR between objectives, macroeconomic priorities, and plans. It then argues that since 1985 there has been an enhancement of the priority status of consumer welfare and a reduction in that of the defense sector in formal economic plans, but the growing disruption of the economy is making it increasingly difficult to enforce priorities during plan implementation. The next section outlines the national security production process and contrasts the different priorities in the Soviet national security promotion strategy in the Brezhnev and Gorbachev periods. This reveals that in recent years the Soviet government has shifted the emphasis from military build-up and confrontation to the reduction of external threats through diplomatic, propaganda, and arms control programs. Finally, an evaluation is made of the priority protection of the defense sector at the microeconomic level. The analysis suggests that the policies of the Gorbachev regime have accelerated the erosion of the effectiveness of lower-level priority protection of defense institutions and are making the operating conditions and behavioral patterns of defense industry enterprises more like those of inefficient civilian firms in the Soviet shortage economy.

THE MACROECONOMIC PRIORITY OF THE DEFENSE SECTOR IN SOVIET ECONOMIC PLANS: 1966-90

The Soviet leadership traditionally has had as its primary objectives the maintenance of Communist Party rule and the protection of the nation from any perceived threat. In order to maximize the possibility of achieving the challenging goals set in the national security area, while taking into account the backwardness of the nation and the linkage between economic and military power, it created an economic system that was dominated by the party and state apparatus, guided by the elite's priority rankings, and controlled using command-administrative methods. This was accomplished by (1) severely restricting private ownership and activity through nationalization of industry, collectivization of agriculture, and establishment of a state monopoly of foreign trade; (2) minimizing the influence of flexible prices, markets and competition and (3) introduction of central planning and
quantity controls, such as rationing. In most periods the highest priority in economic plans was awarded to defense and investment in heavy industry and the lowest to consumption and investment in light industry and services. The combination of central planning, overambitious output targets, priorities and chronic disequilibrium in producer and consumer goods markets spawned an economic system with many of the features associated with the shortage model of the socialist economy developed by Kornai (1980).

There are alternative theoretical interpretations of high priority status related to macroeconomic plans. First, it could be viewed as a heavy weighting in the social welfare function (the cardinal measurement approach). A second possibility is that it could indicate a strong preference (ordinal measurement) for states of the economy that included substantial security-related outputs (Heal, 1973, pp. 12-13). Third, it could mean that leaders have established a ranking of sectors and distribute resources so that the most important one receives the inputs needed to achieve its output targets before provision is made for the other sectors, in sequence according to priority (Ericson, 1988).

Whatever approach is adopted, in empirical terms a high priority ranking of a sector or activity in economic plans would result in an associated share of national income that is significantly above the equivalent ones for other nations (Davis, 1990b). On this basis, one would expect to observe that the USSR has devoted an unusually large amount of national resources to the institutions in a well-defined, integrated security complex.


Throughout the Brezhnev period Soviet leaders recognized the existence of a number of outstanding problems in the economy and in principle favored plans and policies designed to attain multiple objectives, such as the stimulation of technological innovation and improvement of living standards. Despite these apparent intentions and the tightening of

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2 The features of the Soviet economic planning system are discussed in Elman (1989) and Zaleski (1980).

3 According to Kornai (1980), the traditional socialist economy is characterized by non-price (quantity) control mechanisms, paternalistic relations between superiors and subordinates, autonomous behavior of lower-level economic units, sellers’ markets, soft budget constraints, and shortages of most goods and services. The chronic and pervasive shortage environment affects the behavior of all economic institutions in ways that both intensify and reproduce shortages. Kornai argues that due to the unique features of the “resource constrained” economic system, the primary cause of disequilibrium is the quantity-driven behavior of economic institutions, especially in the industrial sector. Prices play only a secondary role in explaining developments in the shortage economy. See also Hare (1989) and Davis and Charemza (1989).

4 Mention of priority can be found in numerous works on the socialist economies. For example, there is a chapter on “Centralized Allocation of Resources and Planning of Priorities” in Zaleski (1980). However, until recently there was little theoretical research on the meaning of priority and applied work on priority measurement. Recent contributions to the literature on priority include Ericson (1988) and Davis (1989a, 1990b).
resource constraints at macro and micro levels caused by worsening economic performance, the authorities established and maintained a high priority status of military programs. They preferred to make trade-offs between the other end uses of national income, investment and consumption, rather than to divert resources from the defense sector to civilian branches experiencing difficulties, such as rail transportation and health.

The high macroeconomic priority accorded to the defense sector by the Brezhnev regime can be appreciated by studying trends in military expenditure and the defense burden. The CIA estimates that defense spending in constant (1982) rubles grew from 60 billion rubles in 1965 to about 110 billion rubles in 1985, which represented an increase in the defense share of GNP from 12-14 percent to 15-17 percent. This sustained commitment to the development of military power resulted in a USSR defense burden that was heavy by international standards (Davis, 1990b).

Recent research has suggested that the defense share of GNP in this period could have been greater than indicated by conventional analyses. First, the CIA estimates may not have reflected the full cost to the Soviet economy of the security sector, the high priority protection of defense institutions, and the cost of empire (Epstein, 1990). Taking these factors into account generates an extended security burden for 1982 in the range of 23-26 percent of GNP. Second, the size of Soviet GNP may have been lower than that calculated by the CIA. If Aslund (1990, and his chapter 3 in this volume) is correct that the national income of the USSR expressed in dollar terms was around 33 percent of U.S. GNP in the Brezhnev period, rather than 50-53 percent as estimated by the CIA, and one accepts the CIA defense spending estimates, then the narrowly defined burden would have grown from about 20 percent in 1965 to 26 percent in 1985 (Davis, 1990d). If the extended measurement of security is compared to the lower GNP magnitude then the security burden in 1985 would have been about 40 percent.

This combination of a heavy defense burden and the failure to alter traditional economic mechanisms contributed to the many deficiencies now associated with the "period of stagnation," such as declining growth rates, sluggish technological innovation, low living standards, and the uncompetitiveness in world markets of Soviet goods. As the economy of the USSR fell ever further behind those of its major competitors, the Soviet elite was forced to recognize the crucial trade-off issue identified by Kennedy (1988, p. 445):

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Information about trends in Soviet defense spending is provided in: CIA (1978); Becker (1985); CIA (1987); CIA/DIA (1988); CIA (1986, Figure 4, p. 10); Steinberg (1989); and Michaud (1990).

These shortcomings are discussed in chapters of this volume by Anders Aslund, Steve Meyer, and James Noren, as well as in Davis (1990a).
Precisely because a top-heavy military establishment may slow down the rate of economic growth and lead to a decline in the nation's share of world manufacturing output, and therefore wealth, and therefore power, the whole issue becomes one of balancing the short-term security afforded by large defense forces against the longer-term security of rising production and income.

Defense and the 12th Five Year Plan for 1986-90

The 12th Five Year Plan reflected the Gorbachev regime's initial medium-term strategy and the associated policies that were adopted at the April 1985 Central Committee Plenum. In brief, the ambitious goals were to accelerate economic growth and technological progress and to improve markedly the quality of industrial goods. For example, national income utilized was to grow at 3.5-4.0 percent per annum versus 3.2 percent attained in 1981-85. Within industry, the output of producer goods (Group A) was to grow more slowly than that of consumer goods (Group B). An especially ambitious target was given to machine-building and metal-working (MBMW), which was to expand at 7.0-7.7 percent per annum. The objectives were to be achieved through programs of personnel changes, labor discipline, limited reorganization and reform of the economy, and modest adjustment of end-use and sectoral priorities (Hewett, 1986). It was thought at the time that the plan and the accompanying reform measures would establish a solid foundation for more radical changes in the 1990s.

One topic not treated at length in plan documents was defense (see the chapter of this volume by Noren). But Ryzhkov (1986, p. 10) did state that during 1986-90 there will be a "full provision of the Soviet armed forces with everything necessary for the defense of our homeland." Given this promise, the worsening security situation of the USSR at the time the plan was being formulated (see part 2.b below), and the ambitious targets for MBMW growth and investment, it was possible to deduce that planned defense spending was to have increased significantly. Since 1989 official Soviet statements have confirmed that this was the case.9

At the time of the formulation of the 12th Five Year Plan the apparent assumption of the Soviet leadership was that the accompanying reform would be of a system-preserving

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7Official Soviet documents related to the 12th Five Year Plan are Osnovanye (1985) and Ryzhkov (1986).

8In the assessment of Hewett (1986), the plan implied a 5-7 percent annual increment in current ruble defense expenditure.

9In his 7 June 1989 testimony to the Supreme Soviet USSR Ryzhkov (1986, p. 5) stated that the 12th Five Year Plan incorporated "growth of expenditures on defense at a tempo higher than the growth of national income." Belousov (1989) states that the planned annual increase in defense industry military output for 1989 was 5.5 percent. See also Noren's discussion in Section 5 of this volume.
type. But over subsequent years the reform process became more radical (Hewett, 1988; Aslund, 1989; CIA/DIA, 1989, 1990). The Soviet government now appears to be committed to shifting the economic system from one characterized by collective ownership and central planning to a market economy with significant holdings of private property (N.I. Ryzhkov, 1990; Gorbachev, 1990). Because the defense sector is an integrated, if privileged, component of the economy, the Gorbachev reforms have influenced both the priority and behavior of defense institutions.

**Defense Priority and Economic Plans During 1986-88**

The public statements of the Gorbachev regime during 1985-88 suggested that it had raised the priority of civilian economic activities in the national welfare production function relative to those of defense, perhaps partly in recognition of the dependence of the nation's security on economic power in the long term. But the annual plans for 1986-88 were for the most part consistent with the conservative, unrealistic 12th Five Year Plan and therefore expressed traditional priorities. For example, investment grew by 8.3 percent in 1986, 4.7 percent in 1987, and 5.2 percent in 1988 whereas real per capita consumption growth was 2.1, 0.4, and 3.0 percent (CIA/DIA, 1988, pp. 7, 31; 1990, Table C-3). Even when the government announced a change of policy in favor of previously low priority sectors, such as health, it proved difficult to ensure results were obtained.

In the case of defense spending, at least one Soviet military leader (General Shabanov) has claimed that defense spending was reduced in this period (Smith, 1988). Gorbachev (1989) and Yazov (1989b) have stated that military spending was "frozen" in 1987-88. However, most Western analyses conclude that a high weighting was maintained on defense sector output and resources allocated to defense grew in real terms by about 2-3 percent per annum during 1986, 1987, and 1988. If this is true and the economy grew at the rates calculated by the CIA/DIA (see below), then there would have been a slight increase in the defense burden over the initial three years of the Gorbachev government from 15.0 to 15.3 percent of GNP (Davis, 1990a).

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10 According to Pozharov (1981, pp. 91-104), economic power at a macroeconomic level is expressed by indicators of the magnitude and growth of aggregate output, such as net material product or gross national product. At the sectoral level economic power measures the actual productive capabilities of branches of the civilian economy of relevance to the armed forces, such as machine building, fuels, and computers.

11 The studies that report increases in real defense spending during 1986-88 are the following: JEC, 1988; DOD, 1986, 1989; CIA/DIA, 1988, 1989; Steinberg, 1988; Michaud, 1990. Other analysts have raised the alternative possibility that the Gorbachev regime lowered defense sector priority in the 12th Five Year Plan and slowed the rate of growth of defense spending (Becker, 1987, pp. 379, 384; Holzman, 1989).
There was much discussion in the USSR of the necessity of altering the pattern of transfers of resources between defense and civilian sectors during 1986-88, but only modest actual change. There were some flows of defense labor out of missile factories and research institutes affected by the INF treaty, or at least within them to civilian production lines and projects (Gorokhov, 1988). On the other hand, the transfer to defense industry ministries of the enterprises of the old light and food industry machine-building ministry augmented the defense sector labor force. The Soviet defense industry continued its traditional program of providing the civilian economy with numerous commodities during the initial phase of perestroika. Most branches of the defense industry increased their 1988 output of civilian goods from 1987 levels but did not always fulfill their ambitious plans (Proizvodstvo, 1989; Tedstrom, 1989).

The Soviet economy did not respond well to the overambitious plans, traditional priorities and ineffectual reform policies of the Gorbachev regime.\textsuperscript{12} Growth rates (in percent) of real GNP were 0.7 in 1985, 3.9 in 1986, 1.3 in 1987, and 1.5 in 1988 (CIA/DIA, 1988, 1989). Plan targets in crucial industries, such as machine-building and metal-working, were chronically undersatisfied and generated supply deficits and production bottlenecks in industry. Furthermore, wage growth exceeded that of labor productivity, output targets for consumer goods and agricultural production were undersatisfied, and only modest increases in imports were made. All this contributed to growing government budget deficits and excess demand in retail markets, and thus to phenomena in the consumption sphere, such as pervasive shortages, queueing, forced substitution, and forced saving.

Priority Shifts and Economic Problems: 1989-90

By Autumn 1988 the combination of worsening economic performance, changes in the international environment, and a build-up of political pressure to improve consumer welfare forced the leadership to reconsider its macroeconomic and security strategies. Evidence of a radical shift in priorities can be found in the annual plans for 1989 and 1990 and in policies of unilateral disarmament and defense industry conversion. Unfortunately for the leadership, these changes have been made at a time when it has diminishing power to control the economy, and outcomes are diverging from targets to an increasing degree.

\textsuperscript{12}The poor performance of the Soviet economy during 1985-88 was due to a variety of factors, such as bad weather, unfavorable trends in terms of trade, and resistance to reform measures by those adversely affected (party officials, planners, ministry bureaucrats, managers, and workers). Furthermore, Kornai (1988) argues the shortage economy possesses numerous macroeconomic and microeconomic feedback control mechanisms that tended to counteract reform efforts and return the system to its "normal" disequilibrium state.
The 1989 economic plan was significantly different from the previous ones in the Gorbachev period (Maslyukov, 1988; Tedstrom, 1998). The target for growth of produced national income (3.8 percent) was set lower than that achieved in 1988 in order to relieve pressures at the microeconomic level and to facilitate quality improvements and technological innovation. All enterprises were to shift over to full khozraschet and self-financing. But according to the Chairman of Gosplan, Yuri Maslyukov, the major theme of the 1989 plan was the "social reorientation of the economy." This meant that priorities were to be shifted in favor of personal and collective consumption. Targets in most welfare areas were raised substantially above those of the 12th Five Year Plan.\textsuperscript{13}

The plan made it clear that some of the resources for the supplements to consumption programs would come from investment, which was to grow by only 2.1 percent. In the 1989 budget, expenditure on defense (the low, pre-glasnost figure) was kept the same as 1988, but the possibility was raised that positive international developments could lead to future reductions.

During 1989 the long-standing problems of the Soviet economy were compounded by new systemic deficiencies (e.g., diminished central control of microeconomic processes), policy errors (e.g., excessive growth of the money supply), and political unrest (e.g., strikes by workers and nationality strife). In consequence, economic performance deteriorated and many important targets were underfulfilled (Gaidar, 1990). According to official Soviet sources the growth of produced national income was 2.4 percent (Ekonomika, 1990; Uskorei, 1990). The CIA/DIA (1990) estimate of GNP growth for that year is 1.4 percent. Khanin (1990) is more pessimistic and calculates that real national income declined by 4-5 percent. In the social sphere, the production targets of many consumer goods and services were not reached but the disposable income of the population grew faster than planned. In these circumstances disequilibrium in consumer markets and shortages of commodities intensified, forcing the authorities to rely more on rationing and the consumer to make greater use of the second economy.

The 1990 annual plan outlined by Voronin (1989) calls for a more modest rate of growth of the economy than in 1989 (only 1.1 percent increase in produced national income). It reflects a decisive shift in the intended end-uses of national income in favor of consumption at the expense of investment and defense and sets much higher growth targets for consumer goods industries (6.7 percent) than for heavy industry (6.5 percent).

\textsuperscript{13} The higher priority of welfare is indicated by the following comparison of the 12th Five Year Plan and the 1989 Annual Plan targets: share of national income devoted to consumption (percent) 78.5 vs. 81.6; growth of social funds of consumption (percent increase) 4.5 vs. 8.2; social sphere share of total investment (percent) 23.6 vs. 28.7 (Maslyukov, 1988).
The reorientation of the 1989 and 1990 economic plans appears to be consistent with observable developments in the defense sector. Changes in the size and deployment of the armed forces are discussed below. In the case of the defense industry, after Gorbachev's December 1988 U.N. speech there was an intensification of the production of civilian commodities and the initiation of an apparently large-scale conversion (konversiya) effort (see Smyslov, 1989; Baklanov, 1989; and the chapters of this volume by Alexander and Cooper). According to Belousov (1989) the targets of the new conversion program include the reduction in the defense industry's output of arms and military equipment in 1991 by 19.5 percent from the 1988 level and the increase in the civilian goods' share of defense industry output from 40 percent in 1988 to 60 percent in 1995. He also claimed that military output would fall by 4.5 percent in 1989 from the 1988 level (rather than rise by 5.5 percent as called for in the 12th Five Year Plan) and by a further 4.7 percent in 1990. The production of consumer goods was to increase by 35 percent in 1990 and by the end of the year one-half of defense industry output will be civilian (Voronin, 1989). As a result of konversiya many defense enterprises have shifted production lines to civilian purposes and developed new civilian commodities (Davis, 1990c). However, progress has been slower than anticipated due to the poorly elaborated national conversion program and the growing disruption of microeconomic relationships in the economy (see below).

Recent developments in Soviet defense spending are unclear from the statements made by party and state leaders. Among the claims or announcements are the following: defense spending was frozen in 1987-88 and this generated a saving of 10 billion rubles from the expenditure approved by the 12th Five Year Plan for 1986-90 (Gorbachev, 1989; Moiseev, 1989); the 1989 defense budget was 77,294.2 million rubles (Soobshchenie, 1989); the 1990 budget is 70,975.8 million rubles, or 8.2 percent below that of 1989 (Soobshchenie, 1989); and the various freezes and cuts will generate savings of 30 billion rubles relative to the total approved in the 12th Five Year Plan (Moiseev, 1989; Yazov, 1989b). Official information is so vague that three options concerning Soviet defense spending in 1989 (increase, constant, decrease) are consistent with it (Davis, 1990b). But the recently published CIA/DIA (1990) report on the Soviet economy estimates a 4-5 percent decline in real defense spending in 1989.

In order to assess changes in the defense burden, account must be taken of developments in both defense spending and economic growth. If one accepts the CIA/DIA estimates of a five-percent fall in military expenditure in 1989 from the 1988 level (to 106.6 billion 1982 rubles) and a 1.4 percent increase in GNP (to 745.8 billion rubles), then this
implies that the burden fell from 15.3 in 1988 to 14.3 in 1989. However, given the margins of error associated with the estimation of both military expenditure and economic growth it is prudent to consider alternative possibilities. For example, if real growth in defense spending was zero in 1989 and GNP rose by 1.4 percent, then the burden would have diminished only slightly to 15.1 percent. In the case that the real growth of the Soviet economy was lower than that estimated by the CIA/DIA (extending the arguments of Khanin/Selyunin and Aslund), the impact on the 1989 defense burden with military spending of 106.6 billion (1982) rubles can be seen from the following calculations: zero growth of the economy implies a 14.5 percent burden whereas a two-percent GNP decline generates a higher 14.8 percent burden.

In 1990, the economy appeared to be out of control by an increasing degree, performance at micro and macro levels continued to deteriorate, with the annual plan underfulfilled to a greater degree than that of 1989. Given these circumstances, it is unclear whether defense spending will be reduced proportionately more than aggregate output will fall and whether the central government will have the commitment or the power to defend the higher priority given to welfare in the annual plan and budget.

THE PRIORITIES OF THE DEFENSE SECTOR IN THE SOVIET NATIONAL SECURITY STRATEGY

The allocation of resources to the defense sector in the USSR is dependent not only on macroeconomic priorities expressed in economic plans but also on those associated with the strategy adopted to promote the security of the country. The basic features of the Soviet national security production process are discussed below. This conceptual framework is then used to interpret the relationship between developments in external threats, threat reduction efforts, Soviet military power, and the national security status of the USSR during 1965-85. It is then argued that the Gorbachev regime has adopted a new strategy that involves shifting priority from the production of military services to threat reduction activities and adopting more modest security status targets.

The National Security Production Process

The national security strategy is developed and controlled by the political leadership in the USSR. It takes into account assessments of the external threat (which has military, political, and economic dimensions) and domestic resource constraints, establishes objective

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14The calculations supporting the numbers in this paragraph are presented in Davis (1990a).
15Kagalevskii (1990); Sotsial'no-ekonomicheskoe (1990); N.I. Ryzhkov (1990); Itogi (1990); Romanyuk (1990).
or subjective goals and indicators, and specifies the programs to be implemented to produce both threat reduction (diplomacy, propaganda, arms control, and espionage) and military services (Davis, 1986a, 1987). The elements of the national security production process are summarized in Fig. 7.1.16

It is assumed that the status of national security (NS) of the USSR can be measured over time by the elite in either an objective or subjective manner. NS status changes are determined by an interaction of the external threat after modification by threat reduction services (TR), and military services produced by the armed forces (MS). The value of NS decreases in response to worsening threats for a given level of military services (MS*). It increases in response to the growth of military services up to the point MS*, but then declines as a result of mounting negative feedback from the arms race.

The external threat environment of the USSR (XT) is determined by military developments (MT) in other nations, but defense-related political changes (PT) and economic trends (ET) are also important. As a general rule, phenomena—such as improvements in NATO’s capabilities, increased U.S. defense spending, the election of conservative governments and high rates of growth in capitalist countries, effective reforms in the People’s Republic of China, and political instability in Eastern Europe—would raise the threat level. On the other hand, unilateral Western disarmament, economic stagnation in the OECD region, and intra-NATO arguments would reduce the threat.

As a prelude to making decisions about national security strategy and resource allocations, the Soviet elite in the national security bureaucracy undoubtedly assesses the current situation and establishes a target level for national security (NT). The decision on this target is influenced by communist ideological objectives, military doctrine, and threat perception. The leadership then develops a plan to ensure that within a specified period NS status is greater than or equal to NT.

In developing the national security strategy to achieve established goals, consideration is given to the prospective contributions of the programs that produce threat reduction services (TR) and military services (MS). The former include the outputs of diplomatic (DI), espionage (ES), propaganda (PR), and arms control (AC) institutions that are intended to reduce the external threat (XT) to the final threat (FT).

16 The original version of this paper (Davis, 1990d) included a mathematical model of national security production. It and Fig. 7.1 focus on the determination of security relative to foreign threats and therefore do not explicitly take into account domestic threats to the integrity of the state (e.g., unrest by nationality groups in republics). Given recent developments in the USSR it obviously will be necessary to incorporate a domestic component in future versions of the model.
Fig. 7.1—The National Security Production Process in the USSR
Military services are produced by the Soviet armed forces. They are designed to offset the final threat (FT) by either confronting it in combat (production of actual services) or deterring it through the maintenance of the capability for destruction (production of potential services) (Davis, 1986a, b).

These services are produced by units of the five major military branches (strategic rocket forces, ground forces, national air defense forces, air forces, and navy) as well as by other supporting bodies. The production process is governed by prevailing military art and efficiency standards. The output of MS is generated using inputs of labor, capital, and intermediate goods. The Soviet military obtains its inputs from four sources: the labor force, the defense industry, branches of the civilian economy, and imports (Davis, 1986b, 1990b).

The national security bureaucracy makes decisions concerning allocation of resources to various institutions in the national security production process. The budgets and supply entitlements (rations) are numbered in Fig 7.1. For example, the armed forces' budget is shown by number 5. The finance or ration entitlement enables the institutions to obtain resources from the domestic economy, as indicated by the flows denoted by letters (e.g., E to the armed forces).

Consideration of this production process makes it clear that a national security target level (NT) could be attained through alternative strategies, which have different implications for resource allocations. First, the target level could be reduced. Soviet strategic thinking is influenced by Marxist-Leninist ideology and military doctrine. Over time both have been modified to take into account changing circumstances. It obviously would be possible to perceive the outside world in less threatening terms and to assign a lower probability to the outbreak of war. Second, an attempt could be made to improve security through increased production of military services. It should be noted that this does not imply a growth in defense spending. Instead, greater output could be obtained through better management and rationalization in the defense sector, military reorganization, and substitution between inputs (Davis, 1986a). Third, the Soviet leadership could decide upon a strategy of national security enhancement primarily through threat reduction. This would involve greater activity by diplomatic, arms control, propaganda, and espionage institutions. One final point is that threat reduction and defense sector institutions have different input requirements, so shifts in strategy would affect resource flows from the civilian to the security sphere of the economy.
National Security in the Brezhnev Period

Developments in the national security production process during the Brezhnev period are evaluated in Davis (1986a, 1987). The evidence is re-interpreted here using the three-dimensional Fig 7.2. The vertical axis shows the national security status (NS) of the USSR. The target level (NT) is represented by a plane perpendicular to this axis. The other axes show FT and MS. The values of $NS = f(FT, MS)$ are indicated by the smooth surface, which is assumed to be continuous and differentiable.

During 1966-85 there was considerable stability in national security institutional arrangements, in the tenure of key decisionmakers, in security objectives, and in basic strategy (Davis, 1987). At the start of this period the Soviet elite probably perceived a considerable gap between their assessment of the nation's security status and their objectives. They therefore supported an ambitious program to enhance national security. Significant support was provided to organizations with the mission of reducing external threats through diplomacy, espionage, propaganda, and arms control negotiations. But available evidence suggests that their services were of relatively low quality. If the assumption is made that they had a constant effectiveness, then the final threat (FT) changed in accordance with the external threat (XT).

A higher priority was placed on military power development. The Brezhnev regime awarded the defense sector generous, increasing allocations of resources and special high priority protection from the adverse features of the shortage economy parts. The sustained commitment of the Soviet leadership to the military build-up resulted in the expansion of all defense institutions and improvements in their capabilities. The size of the armed forces grew from 3.2 million men in 1965 to 5.3 million in 1985. During 1965-85 there were substantial increments to the stocks of most categories of deployed conventional and nuclear weapons and upgradings of their technical capabilities. For example, the numbers of ICBMs and SLBMs increased from 331 to 2,377 and of nuclear warheads from about 1,000 to 8,832.

It can be argued that this effort contributed to an increase in Soviet national security until MS* was reached in about 1977. If the Soviet leaders had been more astute, they would have anticipated at an earlier point that other major nations would react to the military build-up of the USSR by developing countervailing capabilities of their own armed forces and that citizens and politicians in foreign countries would become increasingly worried by the Soviet threat and support more confrontational policies. But the security elite of the USSR

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17 Authoritative assessments of developments in the Soviet defense sector during 1965-85 are provided in the annual issues of the International Institute for Strategic Studies, The Military Balance; and the U.S. Department of Defense, Soviet Military Power. See also Davis (1986b).
Fig. 7.2—Trends in Soviet National Security During 1965-85
apparently remained oblivious to their share of the responsibility for the acceleration of the arms race. In consequence, the external threat confronting the USSR and its geostrategic isolation increased markedly from about 1978 onward.

With respect to power projection, it gradually became more difficult for the USSR, and other major nations, to make decisive use of even vastly superior military power in low-intensity conventional warfare. As a result of this situation and the existence of the nuclear balance, the credibility of the threat of the use of military force and the effectiveness of political intimidation were undermined.

Taking all these factors into account, it appears that throughout the Brezhnev period the Soviet Union failed to satisfy its ambitious national security requirements.\(^{18}\) From 1965 to about 1977 the gap between actual security status and goals closed due to the reduction in external threats (with the exception of that posed by China) and the Soviet military build-up. After that, though, the combination of worsening threat environment and declining security contributions from military power increments progressively lowered in absolute terms the national security status of the USSR.

"New Thinking" and National Security Strategy

Since Gorbachev came to power the Soviet leadership has been influenced by the *novoe myshlanie* (new thinking) in its formulation of the national security promotion strategy and related policies.\(^{19}\) The regime has vigorously applied the *perestroika* program to both threat reduction and defense institutions in order to make them more effective and efficient.\(^{20}\) As a consequence of the new strategy there has been a shift of emphasis within the national security production process in favor of the threat reduction programs of the re-vitalized diplomatic, propaganda, espionage, and arms control institutions.\(^{21}\) The importance of defense sector activities has been diminished in relative terms.\(^{22}\)

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\(^{18}\)Kennedy (1988, pg. 512) characterizes the pre-Gorbachev security situation of the USSR as follows:

> To the decision-makers in the Kremlin, heirs to a militaristic and often paranoid tradition of statecraft, Russia appears surrounded by crumbling frontiers—in Eastern Europe, along the "northern tier" of the Middle East, and in its lengthy shared border with China; yet having pushed out so many Russian divisions and air squadrons to stabilize those frontiers has not produced the hoped-for invulnerability.

\(^{19}\)Authoritative Western evaluations of new thinking include Meyer (1988), Binswanger (1988), Warner (1989), and Allison (Forthcoming).

\(^{20}\)Analyses of reform in the defense sector and threat reduction institutions and related bibliographies can be found in Derr (1987, 1989b, and 1990c).

\(^{21}\)For a good study of developments in arms control see Allison (1990).

\(^{22}\)Critical assessments of the Soviet military that reflect this re-evaluation of security strategy by new thinkers in the USSR can be found in Arbatov (1989, 1990), Pankin (1990), and Y. Ryzhkov (1990). A more conservative view of military reform is provided in Yazov (1990a).
This re-alignment, however, had only a minor impact on the defense sector and defense-civilian economic relations during 1985-88. In this period the reform policies of the Gorbachev regime concerning the defense sector included: purge of the leadership of the military-industrial complex; alteration of military doctrine to give it a defensive orientation; introduction of new personnel policies (e.g., anti-alcohol campaign, strengthening of material incentives; stress on human factors) to improve lower-level performance; and changes in the economic mechanisms governing the operations of defense institutions (Davis, 1987, 1989b).

Although there was little actual disarmament in the USSR during 1985-88, the situation changed after Gorbachev's speech at the U.N. in December 1988 in which he outlined the new national security strategy (Gorbachev, 1988):

After all, it is now quite clear that building up military power makes no country omnipotent. What is more, one-sided reliance on military power ultimately weakens other components of national security. . . . We are witnessing the emergence of a new historic reality - a turning away from the principle of superarmament to the principle of reasonable defense sufficiency. We are present at the birth of a new model of ensuring security - not through the build-up of arms, as was almost always the case in the past, but on the contrary, through their reduction on the basis of compromise.

At that time he announced major unilateral arms reductions in the period 1989-90 of 500,000 men (450,000 within the USSR and 50,000 stationed outside), 10,000 tanks, 8,500 artillery pieces, and 800 combat aircraft.

In 1989 the disarmament process accelerated and by the end of that year the personnel of the Soviet armed forces had been reduced by 265,000 men (Krivosheyev, 1990). In addition about 7,000 tanks, 1,100 artillery pieces, and 600 combat planes had been taken out of service. The announced size of the Soviet armed forces fell from 4,258,000 on 1 January 1989 to 3,993,000 on 1 January 1990.23 A related development in 1989 was that the Ministry of Defense offered for sale to the civilian sector surplus goods (e.g., 20,000 motor vehicles) worth 500 million rubles (Arkipov, 1989).

These changes in the national security promotion strategy and in the external security status of the USSR can be interpreted and contrasted with those of the Brezhnev era using Fig 7.3. First, alterations in Communist Party ideology, military doctrine, and threat perception led to a lowering of the NT. Second, the radical reforms introduced in both threat

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23 The 1989 figure is taken from Sobshchestva (1989). The size of the armed forces in January 1988 was calculated by subtracting from the official 1989 total the 265,000-man cut mentioned by Krivosheyev.
reduction and defense sector institutions increased the effectiveness of their work, which meant that higher levels of national security could be obtained from given quantities of MS in the face of FT and that TR could ensure a lower level of FT for a given ET. In Fig. 7.3 this is shown by the upward shift in the national security surface. Third, there was a shift of priority within the national security strategy in favor of the threat reduction programs and at the expense of military service production activities. Fourth, since early 1989 concrete steps have been taken by the Gorbachev regime to reduce on a unilateral basis the strength of the Soviet armed forces. Given the nature of the NS surface, the military reductions should result in greater national security for a given level of final threat.²⁴

It is too early to pass final judgment on the benefits for the USSR of the Gorbachev regime's national security strategy. Certainly, from the perspective of the traditional Soviet communist elite the national security results of the new thinking strategy have been mixed. On the benefit side, political relations with the United States, Western Europe, and China have improved. The INF treaty has been signed and implemented and progress is being made in arms control negotiations concerning CFE and START treaties. The positive interpretation of these developments using Fig 7.3 is that since 1985 Soviet policy has been successful in lowering the FT by reducing the ET and improving TR. The output of MS has been reduced in the direction of MS*. As a result, the NS of the USSR has increased. Since the NT has been lowered, the gap between desired and actual national security status is significantly smaller than that of the Brezhnev period.

On the debit side from the traditionalists' perspective, the policies of the Gorbachev regime allowed, if not encouraged, the revolution in Eastern Europe, the further discrediting of communism and Soviet-style economic policies, the reunification of Germany, and the dissolution of the Warsaw Pact. It may appear that the reformers have tolerated, if not stimulated, growing unrest within the USSR that threatens not only the existing communist political system but also the territorial integrity of the nation. In sum, influential groups in the Soviet Union could consider that the enlightened policies of the Gorbachev regime have worsened the national security status of the USSR in the period 1985-90 if domestic developments are considered as well as those in the international sphere.

²⁴This idea of obtaining a greater national security return from diminished production of military services is conceptually similar to that behind the Laffer Curve, which showed that greater tax revenue could be obtained by a government from lower marginal tax rates if a nation was over-taxed. President Gorbachev probably should hope that the former is of greater conceptual validity than the latter, and that defense reductions in the USSR generate the desired national security returns more successfully than tax cuts in the United States contributed to the reduction in the federal budget deficit.
Fig. 7.3—Trends in Soviet National Security During 1985-90
PRIORITY PROTECTION OF THE SOVIET DEFENSE SECTOR
AT THE MICROECONOMIC LEVEL

The communist leaders governing centrally planned economic systems have had numerous, urgent civilian and defense objectives, but severely limited resources with which to achieve them. Given this situation, they have developed priority rankings of sectors, institutions, and programs that express their degrees of commitment to ensuring that important problems are solved or goals are attained irrespective of circumstances in the economy. In order to implement priorities, these command economies have developed a variety of resource rationing procedures and enforcement mechanisms that both protect privileged sectors and penalize less important ones.

Sectoral priorities can be measured using at least 12 indicators. In Davis (1990b) it is argued that some of the observable economic conditions and features of the defense industry can be explained by its high priority status as measured by these indicators: above-average wage levels and benefits (e.g., housing and medical care), rapid remedial responses by central authorities to production problems, soft budget constraints, high levels of input inventories, and low intensity of shortages. Another privilege of the defense sector is its special access to Western military-related technology through the spetsinformatsiya system run by the Military-Industrial Commission (CIA, 1985; Hanson, 1987).

In order to understand the microeconomic responses of defense institutions to reform and disarmament policies as well as their interactions with the civilian economy it is necessary to employ concepts and models of both priority and the underlying economic system. Davis (1988, 1989b, 1990c) postulates that defense enterprises behave like a high-priority firm in a socialist shortage economy. To the extent that the protection provided by priority mechanisms is effective, defense institutions have significant market power as a buyer and low intensity of input shortages. However, the analysis raises the possibility that there are conflicts between the influences of the shortage economy and of priority arrangements, especially in the relationship between defense institution buyers and civilian...
organization sellers. If the forces of the shortage economy are as powerful as Kornai (1980) suggests, then even elaborate priority arrangements should be insufficient to ensure that defense institutions are immune from chronic shortages and problems with the quality of their supplies.

The Erosion of the Priority Protection of the Defense Sector in the Brezhnev Period

The combination of generous resource endowment and high-priority protection enabled the Soviet defense sector during the Brezhnev period to expand significantly its productive capacity, upgrade the technological standards of deployed weapons systems and increase its output of military goods and services. Despite these obvious achievements, it became clear by the early 1980s the demands of the Soviet military for technological innovation were exceeding the capabilities of the defense industry and military R & D (Evangelista, 1989). Furthermore, the growing complexity of weapons production and reliance of defense industry on numerous branches of the malfunctioning civilian economy made it increasingly difficult to protect the defense sector from shortage-related problems.

On the output side, defense firms operated in sellers' markets for the military and civilian goods and services they produced. These producing establishments exhibited quantity drives and negligent attitudes toward the quality of their goods (e.g., ineffectual radars and defective televisions) and services (e.g., sloppy construction of buildings). Given the shortage environment, customers were grateful for the products they were allowed to purchase (e.g., military units from defense industry) and accepted the inconveniences caused by late delivery, arrogant behavior of suppliers, rationing, and poor quality. The lack of competition, or even meaningful consumer feedback, made defense institutions complacent, according to Western criteria, about the technical standards of their products. The risk-averse attitudes of managers and the well-known obstacles to innovation in the Soviet economy impeded technological progress in the production of commodities (Almquist, 1990).

On the input side, defense institutions exhibited the conventional shortage model behavioral characteristics of expansion drives, hunger for investment, insatiable demands of intermediate goods and labor, hoarding of resources and maintaining reserve productive capacity, and soft budget constraints (Kornai, 1980). However, due to their high priority ranking they were able to avoid many of the characteristic supply problems of the shortage economy and had considerably more market power as purchasers than is usual for the Soviet economy (Davis, 1990b). Defense institutions were able to order civilian organizations to provide them with contracted quantities of goods that met above-average quality standards
and tighter deadlines. As a general rule, the intensity of shortages was lower than average in the defense sector.

Nevertheless, the civilian sector contributed to defense production deficiencies by failing to provide adequate quantities of inputs of specified standards in accordance with supply schedules and failing to train members of the labor force adequately. Civil society also was a breeding ground for the negative phenomena that afflicted defense institutions. 26 In the Brezhnev period the shortage economy began to overwhelm the defense sector priority protection mechanisms and there was a reduction in the differentials in conditions and performance between defense and civilian sectors.

Perestroika and the Defense Sector

The priority of the defense sector during 1985-90 was affected by several contradictory forces emanating from the economic reform program, shifts in planning objectives, and actual conditions in the economy. The effect of these contradictory tendencies can be appreciated by considering the changes in the economic environment and operating conditions of the typical defense industry enterprise.

With respect to output, defense firms continued to operate in sellers' markets because the maintenance of monopoly arrangements inhibited competition and shortages increased during 1985-90. They responded cautiously to the demands of military consumers and apparently took advantage of the more decentralized and confused authority relationships to fulfill only partially the requests of the central leadership for greater civilian production (Tedstrom, 1989). As a general rule, defense industry enterprises reliably produced commodities only in response to state orders (goszakazy), not to market forces. The continued existence of sellers' markets for output and uncertainty in the economic environment encouraged managers of defense industry enterprises to remain risk averse and reluctant to embark on technological innovation.

Furthermore, there is some evidence that they took advantage of their market power to overprice the goods that were supplied to civilian branches. For example, a secretary of the CPSU Central Committee has stated the following (Stroyev, 1989):

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26 In the case of the armed forces the main defects included: stagnant senior military leadership; laziness, drunkenness, and lack of initiative among officers; poor living conditions of enlisted personnel, which contributed to low morale and substandard execution of duties; low states of readiness of military units; and reliance on an extensive development strategy (Cookburn, 1984; Davis, 1987, and Yazov, 1988). Among defense industry problems were: uneven quality of enterprise management; failures in defense industry planning; the backwardness of technology relative to Western standards; flaws in product designs; negligent supervision and shoddy workmanship; and slack discipline, drunkenness, and corruption among workers and staff (Agursky and Adomeit, 1979; Holloway, 1982; Cookburn, 1984; CIA, 1986; Davis, 1988, 1990b; and Almeida, 1980).
I recently had meetings with the leaders of the defence ministries. From tables and graphs it would appear that the conversion process is not going badly. But in essence it is starting from scratch... And the equipment is inordinately expensive... This year, the defence ministries have increased the prices of 25 types of equipment by one and one-half to nine times. But productivity remains more or less the same... If we do not succeed in moderating these appetites the 77 billion rubles that was set aside for the technical re-equipment of processing facilities in the agro-industrial complex will end up in the pockets of the industrial and construction departments. This without noticeable changes in the state of affairs as regards foodstuffs.

Working conditions within firms undoubtedly worsened. Production was frequently disrupted by shortages and irregular deliveries of inputs. Hoarding of resources remained a wide-spread phenomenon. The budgets of enterprises remained soft, despite new legislation, because there was no real fear of bankruptcy and every expectation of a bailout by the bureaucracy if financial difficulties were encountered.

On the input side, defense industry enterprises continued to receive central allocations of necessary supplies that were linked to the state orders (goszakazy) for their output. However, the modest re-orientation of the economic system from state planning to markets and toward decentralized decisionmaking undermined the ability of the central leadership and the ministerial bureaucracy to guarantee them supplies. Unfortunately for defense firms, this weakening of priority protection occurred in a time of accelerated economic deterioration and supply disruptions and strengthening of the forces of the shortage economy.

Supply difficulties have increased most notably in sections of the defense industry that traditionally have produced civilian goods or recently have been converted to civilian production. For example, at the Votkinsk factory that produced SS-20s a new civilian design bureau was created in January 1989 and several production lines have been converted. But according to Shatalov (1989):

Many problems have arisen and not all of them have yet been resolved. For instance, the designers who came to the new department from main production encountered a shortage of components for civilian output. There they were used to having all that was necessary to hand, whereas here they have to operate making adjustments for deficits.

The spread of self-financing, growth of co-operatives, and the relaxation of controls on the price-setting and profitability of civilian enterprises have caused additional complications for priority protection of the defense sector. Although the average working conditions, wages,
bonuses, and benefits of staff in the defense industry did not deteriorate much before 1989, those of more successful civilian firms improved relative to them. This narrowing of defense-civilian differentials lessened the attractions of employment in the defense sector (Davis, 1989b, 1990b; Isaev, 1989).

These shortage-related problems and the erosion of priority protection may help to explain the statement from Belousov (1989):

The defense industry complex no longer has any noticeable advantages over [civilian] machine building with respect to wages, structure of the main productive fund [fixed assets], age profile or technical conditions of technological equipment. Data of Gosplan USSR show that in the machine building complex the share of imported equipment is even higher than in the defense complex.

Isaev (1989) argues in the same vein that most qualitative performance indicators of the defense industry are not superior to those of civilian branches:

Unfortunately, despite its better technical equipment, higher qualifications of workers, and significant scientific potential, the productivity of labor, capital-output ratio [fondostdacha], energy intensity and other integral indicators of the defense complex on average correspond to those of the national economy in general and lag behind equivalent indicators of developed industrial countries.

One must, of course, be cautious about accepting these critical statements at face value because these defense industry officials could have vested interests in portraying conditions in their sector in an unfavorable light in order to obtain supplemental funds and ward off demands for greater contributions to the civilian economy. However, the assessments of Belousov and Isaev do appear to be consistent with evidence about the state of the defense industry in the post-1988 period.

In sum, the Gorbachev reforms and the erosion of priority protection appear to be making the operating conditions and behavioral patterns of defense industry enterprises more like those of inefficient civilian firms in the Soviet shortage economy. The worsening performance standards and supply situation in defense firms are impeding their ability to carry out both traditional assignments of weapons production and the new tasks of the conversion and disarmament programs.
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8. PRIORITY AND TECHNOLOGY CHOICE UNDER PERESTROIKA

Steven W. Pepper

Mikhail Gorbachev's search to improve the efficiency of Soviet industry has proceeded through several stages. After abandoning the simple notions of "acceleration" and increased discipline, Gorbachev was impelled by events to adopt a more complex strategy for change. Subsumed under the general rubric of perestroika, the two major elements were a traditional investment program for modernizing Soviet industry coupled with a more radical agenda of reform to the basic structure of the system.

These two aspects of perestroika did not receive equal weight. Reformers of the Gorbachevian stamp placed great emphasis on the relative decline of the Soviet technological base as both the most telling symptom and proximate cause of economic stagnation. As the most pressing problem, the leadership attached a strong priority for resource allocation to investment in machine building. The strategy was to front-load investment into this area, in the initial stages principally into the machine tool sector itself, to increase the domestic capacity for providing all sectors with modern, more efficient, and more capable machinery. Success would bring greater flexibility to allocative choices throughout the economy and allow the demands of all sectors, particularly the pent-up demands of consumers, to be met eventually.

Reform of the economic system, as such, was not the primary intent of perestroika. Elements of reform, however, were intended to play an important role by guaranteeing that the present course of modernization would not follow the ones charted by those of the past when Soviet leaders commanded the priority production of higher technology equipment, as during the period of zastoi, only to succeed in producing machines for which there was no demand—"bad" new machines. The efficiency of modernization, in the fullest allocative sense of the term, would be guaranteed by systemic changes leading to strengthening of the horizontal ties between producers and customers, a favorite Gorbachev theme.

In concept, modernization and reform were to proceed along parallel courses although the timing suggested modernization was to receive priority with reform elements added as

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1This paper draws upon the findings of two studies by the author: Modernizing the Soviet Textile Industry: Implications for Perestroika, RAND, R-3779, Santa Monica, October 1989; and Prospects for Modernizing Soviet Industry, RAND, R-3785-AF, January 1990. The first study used an inductive methodology to examine the reality of modernization in one sector of the Soviet economy. The second elaborated upon those findings to generalize the discussion and provide a critique of perestroika as technology policy, particularly as applied to advanced manufacturing technologies.
the production possibilities of the Soviet economy increased. The centerpiece of the Twelfth Five-Year Plan was the transfer of resources to abet modernization. In practice, Gorbachev's reform vision became increasingly "radicalized" and the pace forced when it became clear the current modernization program was not yielding any success greater than that of its predecessors. But modernization and reform moved along different tracks with reform characterized by haphazardness and a pace prompted by the increasing frustrations with the return from modernization.

In early 1990, modernization, conceived as a major reallocation of Soviet investment priorities, appears dead. It could not produce the desired change in the time allotted by the realities of domestic politics. Priority has shifted once again, this time to a program for increasing the production of consumer goods to retrieve the economy from incipient crisis. This paper will suggest why the original design for modernization failed. It will point to both fundamental errors in the strategic conception of Soviet modernization as well as to a failure to perceive fundamental reform of the economic system as the essential precursor to the type of transformation so urgently required in the Soviet technological base. This study may be read as an examination of the causes of that failure. However, it is intended as more than a mere post mortem. The basic approach to general economic planning and technology policy under perestroika appears to remain unchanged. Therefore, the conclusions will retain their validity for analyzing any future Soviet programs for industrial modernization and technological development, as well as the current campaign for "conversion" of the defense industry, as long as there is no more profound change in the Soviet economic system than appears likely at this time.

THE POLICY ENVIRONMENT

A policy to change the technological basis of an industry or an economy has to address a series of issues. The first is to determine feasibility, that the material resources necessary to implement the proposed program will be available from either domestic or foreign sources.

A second issue is whether the resulting output will be of sufficient quality to support adequately the requirements of the technological development scheme. Since 1985, this has certainly become the central question posed by the Soviet political leadership, which might be characterized by its rhetorical commitment to the primacy of quality over the more engrained preoccupation with quantity.

Setting appropriate targets for quantity and quality appear, at first, to provide adequate structure for determining priority and the direction development should take.
Neither of these, however, speaks directly to the question of policy. They define ends, not means.

One policy choice left unresolved is how, and by whom, different production technologies are to be chosen. Current Soviet institutions, even after introducing changes in the mechanisms of economic management, are insufficient to guarantee appropriate technology choices. In the absence of such means, the direction of modernization has not been well-informed and has yielded disappointing results; resources continue to be allocated inefficiently. Indeed, the serious consequences for the economy may be magnified the more modernization is pursued. The standards used to judge the adequacy of domestic equipment introduce a bias against producing least-cost solutions to manufacturing problems.

A further policy issue directly affects the potential result of any modernization program. An effort primarily directed to putting the most modern technical means in the hands of manufacturers could well miss a crucial point. If the recipients do not use these means efficiently or appropriately, the modernization will not meet its intended purpose. In this analysis, the apparent problem of lagging technological level in Soviet industry comes from two sources. The most obvious is that the industrial capital stock, taken in aggregate, is old both in terms of technological vintage and in years of service. This fact has most strongly drawn the attention of the present leadership and given the program of modernization its bias in favor of emphasizing the adoption of leading edge technologies.

A second detriment to technological performance, largely masked by the first, is that the Soviet Union needs to have the capital it possesses achieve its potential, whatever its technological level. The Soviet capital stock of whatever vintage is not used efficiently. Utilizing the current stock of capital in a more efficient manner could yield substantial productivity gains while requiring a less extraordinary investment drive. Under prevailing Soviet conditions, campaigns emphasizing the hardware aspects of modernization will result in great costs to the economy and are unlikely to realize adequate payoff in increased quantity and quality of output. Indeed, campaigns of this type might be dangerous to the longer-term prospects of the economy, not only because they entail large-scale expenditures that cannot be recouped, but also because they divert attention from the industry's most pressing problems. The longer the delay in addressing these primary problems, the more serious will be the consequences for the Soviets. The balance of this paper will explore these themes.
THE QUANDARY OF TECHNOLOGY CHOICE

The Law on the State Enterprise, the cornerstone of the economic reform, was intended to give the enterprise greater scope for decisions affecting production and development. As a matter of practice, this is difficult to achieve because supply bottlenecks, the price system, delivery requirements, quasi-monopoly, and ill-defined property rights above all conspire to limit enterprise authority. Inconsistencies in the structure of the economic system suggest the continuing need for extra-enterprise authorities to allocate resources and direct activities according to centrally established priority. These phenomena may not be transitory; one of the roles explicitly reserved for the ministry in the design of perestroika is to serve as the planning staff for its sector's development. It is intended to possess the power to influence technology choice.

The sphere for action by the enterprise is circumscribed by decisions already taken and preferences imposed by the ministry in discharging its legal responsibility. This may be viewed as a necessary arrangement during the period of transition, but the solution is illusory. The same factors inhibiting enterprises from becoming more decisive in choosing technology and setting priorities also render the ministry ill-suited to take up the slack.

A doctrine of reasonable sufficiency, analogous to that articulated by Gorbachev in defense affairs, is essential for assessing capital equipment requirements. Selection of appropriate technology should be based on criteria other than mere technological feasibility or modernity. To produce machinery embodying technology too elaborate for the intended task imposes unnecessary costs upon the economy. The Soviet economy needs to be made more efficient in using material, labor, and intellectual resources. The technology to achieve these ends will not necessarily be exclusively on the leading edge. Yet, Soviet economic institutions disenfranchise the enterprise and place the ministry in the lead position on priority setting and technology choice without providing the necessary means to place into operation a "reasonable sufficiency" decision structure. This leads to over-emphasis on highly expensive equipment, often not well-suited to its intended purpose or setting, and what is worse, a narrow restriction on the set of permissible technology options.

A large difficulty resides in the ambiguous definition of "quality" and the impossibility of arranging the characteristics desired in a machine along an agreed-upon, one-dimensional axis. In practice, the concept of quality is multi-dimensional. The term may indicate the technological level of the apparatus—the more advanced, the higher the quality. Quality also carries the connotation of discrimination on the bases of reliability, ease of maintenance, and time between service. Further, there is the aspect of suitability to a specific production
program. By what algorithm, and by whom, are these various attributes to be reconciled in choosing between alternative designs for a given machine?

In a market economy, this problem is resolved, ideally, by giving the machine's user sovereignty over purchasing decisions. The user is judged to be the most likely to possess the information required to choose between alternative machines offered by competing vendors. The drafters of the Soviet legislation had this model in mind for the operation of the new system of industrial economic management.

Several factors inhibit realization of the model. The true economic independence of enterprises is limited. This limits the ability to make meaningful decisions over technology choice. In many sectors past underinvestment has left enterprises ill-equipped to accept the sole burden of undoing decades of neglect. Individually tailored norms for taxation and profit retention also redistribute net revenues from the stronger enterprises to the weaker. In addition, enterprises do not possess the necessary information and incentive to be authoritative in these matters. Further, a great deal of machinery is produced under conditions of quasi-monopoly. Because it is difficult for machine users to turn to other sources, it is difficult to make their voices heard by the machine builders or to make the concept of "direct tie" contracting work to their advantage except through the negative action of delivery refusals.

As a tacit admission of the lack of sufficient enterprise authority, the state effectively makes and enforces the decisions of machine choice through the ministry planning bodies and the organs of gospiemka. The ministry sets the standards and the state quality inspectors enforce them. This is a source of weakness for modernization under perestroika. A system of state-enforced standards need not, and most likely will not, yield a system guaranteeing optimal economic utility for the users. In addition to the problem of determining what characteristics are to receive emphasis, there are also the problems of data collection, timely analysis, conflicting local interests, and bounded rationality that so bedevil bureaucracies. These problems are magnified during a time when, as currently appears to be the case, older technical approaches are being challenged by a proliferation of newer technological applications. Manufacturing processes are being redesigned world wide. It is not at all certain which path leads most directly to the future.

The Soviets believe they have found a way out of this quandary. Because the leadership perceives an increasing gap between the technological base of Soviet industry and

2Although the gospiemka system appears to be nearing the end of its short bureaucratic existence.
that of the West, the "world technology level" should be identified and then used as a yardstick for measuring progress toward increasing the quality of Soviet output. This would appear to solve both the problems of defining specific end goals and of circumventing the lack of information preventing Soviet institutions from generating adequate approaches to the needs of industry. And it suits Gorbachev's agenda. In his address at the 1987 Party Central Committee conference he reiterated:

I would like to emphasize again and again that the goal of reaching the highest world level of machinery, equipment, and instruments that are being manufactured is the primary task of machine building...Machine builders will receive any kind of aid they need from the state. But their responsibility for the fulfillment of all the decisions adopted will also be increased.  

When this strategy is allied to a campaign for investment and modernization, the message becomes oversimplified and results in entirely inappropriate decisions over technology choice. In most sectors there exists a continuum of technologies with differing degrees of sophistication that could be applied. The most advanced technology is not always the most appropriate. Neither does the appearance of a new technology render earlier approaches obsolete. Assortments of technological solutions are applied in the United States, Japan, and other Western advanced industrial economies. The rule of thumb currently applied to technology choice in the Soviet Union does not look to the full range of the West's machine stock but rather to what is emerging on the margin, and then only selectively.

As a result, the line of machinery chosen to effect the modernization program has been skewed. The case of shuttleless looms in the textile industry illustrates how state-imposed standards may lead to inappropriate choices in machine building and efficiency losses to the economy.

Soviet textile enterprises have long complained that only one machine-building production association produces a certain rapier-system shuttleless loom. The output from this single plant has been insufficient to satisfy the demand of textile producers (Khavkin, 1987). Instead, the textile machine-building plants, soon to be joined by the single ATPR producer, manufacture a type of shuttleless loom using a more recently developed (hence presumably superior) technology. There is reward in this for the machine builders, because the machine has been certified as being "world class," so it can be sold at a bonus; the old

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2This approach is similar to that used in CMEA to generate something approaching efficiency prices for hard goods. There is no mechanism organic to the institutions of that organization adequate to perform this function.

type is less technologically advanced and carries a low-level certificate of quality, imposing a penalty on the manufacturer.

The textile enterprises, the ultimate recipients of this output, cannot use the new loom as successfully as they could the old. It is less reliable and more difficult to repair, it takes up more room (a consideration because access to construction resources is a bottleneck), and, paradoxically, because of the low quality of raw material inputs to textile manufacture, the rate of yarn breakage is higher on the more sensitive new machines so production is slower and more labor intensive. In this case the search for the leading edge appears to have imposed a tangible cost on the economy.

This example treats a traditional rather than a higher-technology manufacturing process in a branch with a fairly uncomplicated production process. The problems are magnified as the complexity of the task and sophistication in the equipment increase.

Branch ministries lay down a principle of developing and accepting for series production only those models of equipment meaningfully surpassing the existing counterparts (Loginov, 1988). In practice, this means branch research institutes send out to the machine builders demands for new equipment with an overriding concern for the technical level as determined by a concatenation of numerical indicators (productivity, weight, power consumption, etc.). The price of the item is not included among the several indicators. The set of indicators is made equal to those characteristics applying to the best foreign analogues (the best are chosen among those having the highest indicators), and if the machine does not lag in any parameter it is considered to correspond to the "world level." If it lags in any single indicator, it is considered not to correspond to the world technological level (Khavkin, 1987).

In the West, firms produce a wide range of machines from the simple and inexpensive to complicated, automated varieties with microprocessors requiring large outlays and highly qualified staff. Through competition each type finds its buyers. The machines with the highest technological level by no means dominate the market. The buyer determines which is most suitable according to his own technological level, price, and many other factors. Most important, the correspondence between technological level and price is clear.

The domination of technology choice by the ministry, coupled with the singularity of its determination to permit only a narrow range of acceptable applications, imposes costs on the economy and undercuts the purpose of the modernization campaign. The inefficiency of the resulting reequipping is noted by the director of a cotton combinat (Molodtsov, 1987):
The orientation toward the output of [rigorously standardized] (metrogonnoci) equipment works to the detriment (sbermylas' poteryami) of both consumers and enterprises. One enterprise, after reequipping, dumps into the warehouse unneeded coarse calicos—since it doesn’t have the means to produce more complicated fabrics. Another, which continues to produce a useful and demanded assortment (using old equipment), is also in a bind. People don’t want to work on obsolescent machinery and looms, but there are no equivalent replacements.

Further, the preemptory nature of ministerial prerogative under perestroika means alternative technological solutions are not widely explored. But the machine builder receives a powerful and unambiguous message from the using sector’s ministry. The planning documents from the machine builders’ ministry also inform them of the criteria by which they shall be judged. Plans speak little to the question of actually modernizing industrial sectors and much of the need to push an ever greater rate of “new” equipment out the door of the machine building plant. Little wonder, then, that it appears to the same director of a cotton combine that (Molodtsov, 1987):

today machine builders are not interested in the production and modernization of the technology we need. For them this is only a headache. The price of equipment, and together with this the financial condition of the [machine building] enterprise, does not depend upon the consumer’s characterization of the machinery produced, but rather on the amount of money expended upon a machine. And as a result we receive more complicated and more bulky machinery whose productivity is less than its predecessor’s, but whose price is incomparably higher.

This statement explicitly links the problem of technology choice to the nature of the price system.

The world technological level strategy is symptomatic of a systemic inability to determine users’ true needs, or indeed, of users themselves developing a clear picture of their requirements. The unreformed price system and the lack of competition among vendors make it difficult for the Soviet economy to generate and act upon sufficient information when choosing between alternative technologies. The world technological level expedient routinely skews choices in favor of more costly means than would be efficient for meeting the needs of users, means that may even be ill-suited for their intended purpose. The ministry and its decisionmaking organs are thus forced to serve a function for which they are not prepared. The result of carrying forth a program of modernization through front-loaded investment under these conditions will be inefficient utilization of national resources, precisely the problem the modernization campaign is intended to address.
FUNDAMENTAL SOURCES OF INEFFECTIVENESS

A modernization program will do little to change the productivity characteristics of an industry if the equipment created by investment efforts is used in an inefficient or inappropriate fashion. If the new machinery uses new technology or novel applications of existing technologies, modernizing a factory’s production equipment often requires redrafting the fundamental production process to take full advantage of the greater capabilities embodied in that equipment. The act of adopting new equipment is not enough. Successful adoption often requires conscious adaptation of the environment in which it is to be set.

Although the Soviet machine users may, with justice, complain about the way the machine builders and design bureaus design equipment for them, the latter might complain in turn about the way their new machinery is used. In this light, the example of the shuttleless loom becomes more complicated and its lesson less obvious. The anecdote appeared to illustrate the machine builders’ imperviousness to signals from textile manufacturers. Instead, taking their cue from the ministry to improve the technological level of their output, they produced newer shuttleless looms inappropriate to the needs of the users. The weavers, in turn, said the looms were not suited to the raw material inputs they received and the conditions in their plants. However, textile manufacture is, in fact, an instance where it is possible to produce a superior product from inferior raw materials. Adding several preparatory steps, operating the spinning and weaving machinery more slowly to reduce breakage rates, and generally adjusting the output profile of the enterprise to suit the means at its disposal would sidestep many of the weavers’ problems. In other words, there is a need to adjust the production process to the change in the technology of production. Why do the Soviet enterprise managers not do this, or do so only slowly and under duress?

One problem may be simple ignorance. Most Soviet industries have had an overwhelmingly domestic orientation for decades. Soviet enterprise managers are not well-versed in the variety of options available for improving product quality developed elsewhere. Specialists rarely visit work collectives, few give talks to production workers, and the propaganda effort in promoting knowledge of new ideas is poor. Further, enterprises lack regular information on equipment available both domestically and from abroad and do not receive adequate instruction in the operation of new technology.

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5The introduction of numerical control in Western metalworking industries, for example, often required a redesign of prevailing production and job scheduling techniques for the new equipment to succeed (Popper, 1988).
How is an enterprise to determine when it is operating new equipment incorrectly? If technical-economic performance indicators do, will it be clear the new machinery may yet be far from achieving its potential? A firm in a market economy often receives a painful lesson if it is operating machinery in a less efficient fashion than its competitors. Soviet enterprises have been largely insulated from such learning. With protection from import competition, high levels of concentration, restrictions on output profiles, and individually tailored rules for the use of enterprise funds, not to mention the isolation imposed by underdeveloped transportation and retail infrastructures, enterprises are kept effectively ignorant of accepted best practices with new equipment. They certainly are protected from receiving the "invisible foot" from their performance in the market that would be an early harbinger of ill-adjusted production practice to a Western firm. There is little prospect of learning from other enterprises and thus wide variation in the results achieved with the same machinery.

Beyond the lack of information is a lack of sovereignty (and hence incentive) for using the information available. Returning once more to the problem of yarn breakage with newer types of processing equipment, which of the expedients open to a Western textile producer are available as a practical matter to the Soviet textile producer? If there are only episodic deliveries from unresponsive raw material suppliers, producers may not have the luxury of allowing fibers to equilibrate to plant humidity levels to reduce breakage. Operating machines more slowly and taking extra steps would lengthen the time of production runs; the quantity indicators of the enterprise would then suffer. Similarly, changing the production recipe by altering the preparation process, and incidentally modifying the technical characteristics of the ensuing output, would place the plant in technical violation of quality norms and lead to problems with state inspection. Finally, using what the enterprise has available to produce in a flexible fashion what is best suited to its means would require altering the enterprise output profile. This remains the prerogative of the supervising ministry.

Lack of sovereignty also extends to existing enterprise organizations. One of the curiosities of the reform effort accompanying the modernization campaign is that while

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6The same problem occurs in the design of new machinery. The output derived from the use of a new technology may be different from the traditional output but the ministry wants it to be the same. It is then easier to account for it within the traditional assortment guidelines. This created great problems for the designers of the new spinning technology who had to redesign their apparatus many times to ensure that the yarn produced was not only as good as the old, but identical (Biryukova, 1987).

7Further, according to the decree designed to improve the performance of the system of state orders, enterprise rights to contract freely for sale of the remainder of the output not covered by state orders "shall not, without justification, permit the unilateral cessation of [previous] ties." This is another check to self-generated changes in output profiles. See "Temporary Statute on Formulation of State Orders for 1989 and 1990," Ekonomicheskaya Gazeta, No. 31, July 1988, pp. 18-20, in PBIS Soviet Union Daily Report, August 26, 1988.
enterprises are being asked to behave in a new manner consistent with a changed milieu of economic information and control, the enterprises themselves retain the same form as under the previous system. They are still the rigidly stratified organizations specifically designed to operate within a hierarchic system of command control. Activities are organized by functional department rather than production tasking. Information and decision authority still move in a pronouncedly vertical direction and answer less well the needs of a self-sufficient, entrepreneurial economic agent than they do to those of a controlling regime of higher management outside the enterprise itself. Authority for redrafting enterprise internal organization remains with the ministry if only because of the supervisory and data collection roles it retains. To be sure, the intent is to reduce gradually the number of reporting requirements incumbent upon enterprises. But the actual fact of formal reporting may be less injurious to enterprise initiative than the implicit lesson underscored by reporting requirements: Most major decisions ultimately rest with higher authority. And the job of these authorities becomes more complicated if the enterprise is left to chart its own course.

The reformed Soviet enterprise and its boundaries are not as well defined as those of the Western firm. Inherent in the definition of the firm is an understanding of the decisions that fall under its authority. In many instances the decisions made by the Western firm’s management would, in the case of the Soviet textile enterprise, either fall to the “external” management authorities, especially in the ministry, or not be formally assigned to any economic agent.

This has consequences for modernization. Ministries are necessarily concerned with issues affecting more than an individual enterprise. Decisions taken by ministries to enhance modernization will not necessarily be optimal for the welfare of a single collective. Decisions over pace and form of modernization are a fundamental prerogative of firm management. A competitive selection process, to be effective, requires different agents to follow different strategies based upon local information. To the extent that an increase in competitive behavior is part of the logic behind the new strategy for economic organization in the Soviet Union, the lack of sufficient authority on the part of the enterprise will undercut the ultimate effect of the changes. Further, an important self-correcting stabilizer and check on the ministry’s decisions as the chorus master of technological development is missing from the system in its present form.
THE CONCEPT OF MODERNIZATION

The extended discussion of sovereignty and the barriers posed by the organization of the enterprise to the availability and use of information is important for understanding the shortcomings of perestroika as technology policy. The leadership failed in its conception of the modernization drive and in the resulting placement of priority. To understand this point, we may idealize any manufacturing process as a means for transforming raw or semi-finished inputs into final goods. But three additional inputs, not transformed by the production process, must also be drawn upon. These must be suited to each other for the process to be efficient. The most obvious is the physical capital stock at the disposal of the manufacturing enterprise. But there is also the input that comes from management. Management’s control leads to constant readjustment of the manufacturing process, in line with evolving needs, allowing the capital to realize its potential. Finally, management efforts, in turn, are based upon information providing the knowledge upon which managers act.

The Soviet modernization effort is overwhelmingly addressed to changing the character of the first of these three input categories. The conception is that if the material and technological base of manufacturing, narrowly confined to refer to the capital stock of the enterprise, is improved, then the efficiency of production will be affected and productivity increased accordingly. The experience of the West, however, has been that to pay excessive attention to this sphere of operation without assuring the efficacy of the other two—management and information—means that a substantial investment in capital will not help realize a substantial, commensurate change in productivity.

Priority and Advanced Manufacturing Technologies

The themes presented above are well illustrated by the program to emplace ultramodern manufacturing installations as emphasized in Soviet rhetoric and upon which such priority was placed.

Certain lessons on the appropriateness of introducing advanced manufacturing technology have been learned in the West. Failure at the outset to consider the mode of utilization by the end-user leads to efficiency losses and suboptimal utilization. This is also a sine qua non for a modernization effort employing a concept of technological reasonable sufficiency. Experience has shown that successfully applying even the simplest forms of advanced manufacturing technology, numerically controlled machine tools, requires

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8The term covers, at the “simplest” level, numerically controlled (NC) machine tools and robots, the linking of such equipment with computers into flexible manufacturing cells (FMC), and the aggregation of FMCs into plant-wide flexible manufacturing systems (FMS).
considerable change in management roles, production processes, and plant practices. A strategy must be in place before any funds are spent on new equipment.\footnote{The advanced manufacturing technology itself is not the sole source of all the benefits it confers upon the firm. Rather, while planning for its adoption a plant may obtain a clearer perspective on waste generation and its control, more information on tool wear, allowing changes that will permit greater adherence to tolerances and precision, and as a result of this, an improvement in product quality.}

Successful implementation of advanced manufacturing technology requires an interdepartmental task force approach to manufacturing. Extensive internal hierarchies are a potential barrier to success. When there is no recognition of the different approach to manufacturing required for adoption of this technology, investments may then lead to institutional paralysis and a reduced willingness to reexamine enterprise procedures and manufacturing processes—especially if lack of information inhibits detection of inefficiencies in production.

Western firms taking a “campaign” approach to advanced manufacturing technology, investing heavily in new state-of-the-art plant, have often found the results disappointing (\textit{Economist}, 1988.) Successful approaches have been characterized by incrementalism. This also means emphasizing the need to prepare the auxiliary services, especially materials transfer and storage, to realize the full benefit of the inherent technology.

For the Soviets, or any other potential user, to concentrate upon developing a capacity for producing and diffusing advanced manufacturing capital goods is to emphasize the appurtenances of modernity rather than its essence. The goal of a modernization process should not be modernization of the machinery stock. This can only be an adjunct to the true purpose of modernizing the process of manufacturing itself. Technology is the tool that makes it possible and is the most visible and tangible manifestation of change. To concentrate on the machinery is to miss the essential.

This apparent lesson suggests the implicit policy of technology choice and priority allocation operating under \textit{perestroika} is ill-suited to its purpose. The architects of modernization intend it to be revolutionary, increasing the rates for scrapping existing plant and force-feeding machinery of a profoundly different character into Soviet industry, while priorities are fixed on the hardware rather than making it be the last step in a comprehensive solution to the problems besetting Soviet industry. In the Soviet setting the need for linkage between the hardware and the system for its management is not readily apparent. Economic institutions are inadequate to detect and rectify conflicts.

The tendency toward campaigns countervails the step-by-step approach. There are also deficiencies of managerial resources, incentives, independence, organizational flexibility,
and, above all, of information flow and the means to analyze it, that are necessary to turn the incremental approach into a virtue rather than a problem. Transformation is more urgently required in the area of management than in technical reequipment.

Articles by Soviet observers lend credence to the supposition that Soviet industry is poorly poised to make efficient use of advanced manufacturing technology, and certainly not in the volume originally projected to be produced under the modernization program. FMS have failed to bring the expected changes in the enterprises in which they have been placed. By the end of 1987, there were about 300 FMS installed in the Soviet Union, but these have been described as a “total loss,” and the result “ruinously wasteful for society” (Vasilyeva, 1988). FMS are installed in a thoughtless manner and merely increase the buildup of unfinished products, further slowing the turnover of working capital.

The Soviet Union is also becoming a world leader in industrial robot production. A considerable number of domestic robots continue to remain inactive, exceeding the idle times of more traditional equipment (Khetsman, 1988). L. Koshkin, director of the intersectoral science and technology complex [MNTK] “Rotor” says, “Each robot causes economic harm. It is minimal... if the robot remains in the warehouse. If it is used, the damage increases as a result of service and reduction of the productivity of the equipment that is being operated.”

Soviet experts call attention to the low reliability of domestically produced technology and its comparatively high price as reasons for the lack of success in practice. Others, however, stress imperfections in the methods used to determine economic effect and note that even highly reliable imported equipment has failed in the Soviet setting (Vasilyeva, 1988). Even in a showcase enterprise like the Leninist Komsomol Automobile Factory in Moscow, cited by the Minister of the Automotive industry as “the leader in the business of robotization,”12 the FMS installation, introduced at a cost of some 1 billion rubles, is capable of producing only one-quarter of its planned output (Ivanov and Shogin, 1988). The plant suffers from poor equipment and shortages, and many robots were obsolete at the time they entered production. Further, because of the chronic excess demand for passenger vehicles in

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10In 1986, the People’s Control Commission examined the operation of 16 existing FMS installations. “All the examined FMSs were considered to be the best of scientific and technical achievements, with millions of rubles in savings and hundreds of freed-up workers. The reality turned out to be otherwise. Thus, for five FMSs with a total cost of 26.3 million rubles, instead of the promised annual gain of 3.5 million rubles, there were losses amounting to 250,000 rubles. Only 24 people were freed up” (Volchkevich, 1988).

11This might be dismissed as a self-serving polemic. After all, Koshkin’s organization, in a sense, is dedicated to producing a technology that competes with the robotic approach to materials handling. Yet in 1986, the People’s Control Commission found that the economic effect of 600 installed robots was 0.2 percent of cost (19,000 rubles/year at a cost of 10 mln). In 1987, the average payback period for robots in the enterprises attached to the Ministry of the Automotive Industry was 38 years, and 196 years in the Ministry for Heavy Machine Building (Koshkin, 1988).

the Soviet Union, there is no need for the continuous changes in style and models FMS technology is designed to provide; and, indeed, the equipment is not used in that fashion. The inherent flexibility is not realized, while the high costs of production are passed on to the consumers or the state budget (Vasilyeva, 1988).

This example deserves closer attention. Ministries press for introduction of FMS based upon the policy of seeking the world technological level. But not being well-positioned to implement changes in management and lacking access to the market information indicating whether such an investment is advisable, Soviet FMS installations are more expensive in operation than they need be. Indeed, the example of the FMS in the automobile plant suggests machining costs may be greater than they would be with less expensive, more tractable technology. Given they have neither the capacity to operate nor the need to install FMS in this instance, a different technological approach would have been more appropriate and less costly, but was not generated by the policies in place. Flexible manufacturing fails in this setting because of the narrow terms in which its use and effect are conceived.

Worse yet, it may take a good deal of time before it is even suspected that an installation is not achieving appropriate performance levels. Information available to enterprises on their own internal processes is not markedly better than that possessed by the ministry. Lack of accounting systems suited to track equipment performance, difficulties of cross-departmental information sharing and task-forcing, and the local management’s limited authority to redraft production processes, mean that a Soviet enterprise employing advanced manufacturing technology has limited means for receiving adequate warning when its utilization is inefficient. If after investment in FMS a Soviet enterprise were able to claim increased product reliability, higher labor productivity, and more output for both domestic and foreign markets, laudatory stories would appear in the Soviet press extolling management for being on the forefront of modernization, irrespective of all not being well on the shop floor. Only the most perceptive of trained specialists might harbor some doubts about the cost of these achievements. Taken in aggregate, enough investment of this type would lead to favorable trends in the comparisons between the Soviet capital stock and the world technological frontier, accompanied by further increases in Soviet capital/output ratios.

LESS EFFICIENT OR INEFFICIENT?

The Soviet approach to assigning priority for investment may not be considered fully satisfactory as technology policy. However, if it follows a path less efficient than one with the necessary reforms already in place, will the effort still ameliorate Soviet production possibilities? In particular, will the emphasis on advanced manufacturing technology provide
a net benefit to the system, albeit a less substantial one than might otherwise have been gained?

To a certain degree, the answers to these questions depend on the demands placed on Soviet industry for consumption and producer goods. As long as assortments are narrow and product runs long, it does not pay to equip plants with the greater degree of flexibility that must be utilized for advanced manufacturing technology to justify its cost. However, the manufacturing machinery purchased today will in large part govern the Soviet ability to produce the goods demanded tomorrow. Yet costly programs to produce advanced domestic equipment not well suited to the needs of the machine users could prove a large drain on national resources.

Figure 8.1 illustrates the main point, albeit in a highly simplified and abstract presentation. The three sets of curves in the figure demonstrate returns on investments in advanced manufacturing technology for three “countries.” The vertical axis measures the

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Fig. 8.1—Return on Investment Under Several Economic Regimes

13 Although referred to as Japan, USA, and USSR, the representations are stylizations and were not derived from actual data series.
gross output produced by industry per unit of investment in manufacturing capital.\textsuperscript{14} This axis is set at the origin at 1, the point where each unit invested in manufacturing equipment returns one unit of output. It is certainly possible to pass below this point.\textsuperscript{15} The horizontal axis, although measuring technological vintage, is not interpreted as a time coordinate but rather as a hierarchy of increasing costs attending the currently available investment choices.\textsuperscript{16} More advanced technology is achieved only with a greater outlay for manufacturing equipment and the other costs associated with refitting, retooling, and retraining. The broken vertical line represents the "world technological frontier" as it would be assessed in current Soviet usage: the technological level attained in practice by the leading industrial country. The figure, then, shows three continua of idealized investment choices and resulting technological levels that exist at a single moment.

The figure implicitly indicates that at each level of technology "Japan" is absolutely more efficient than is the "USA," which in turn dominates the "USSR." The shape of the curve marked "Japan" suggests that a nation following its path would best be served by investing in leading-edge technology, the point of maximum attainable output per unit of investment as represented by the flat slope of the short, horizontal line tangent to the curve. A greater efficiency of output is not possible in this setting. To pass beyond this point to the right would require even greater investment in untested or not yet sufficiently understood technologies and would be unlikely to repay the investment costs as well as the technological vintage represented by the point intersecting the dashed vertical line.

An industry possessing the characteristics inherent in the curve marked "USA" would achieve its optimal level of output return on investment at a technological level slightly below that of "Japan." Its return on investment would also be commensurately smaller. If it were to pass beyond this point to the section of the curve lying on or to the right of the dashed line, the investment would not yield sufficient return; experience suggests future investment choices would once again cross the line to the left as experience will have shown.

\textsuperscript{14}This crude measure was chosen in preference to internal rate of return because the latter depends, in part, on starting position and investment patterns; a higher base level of efficiency stemming from previous investment will reduce the internal rate of return. The intention is to abstract from previous investment and use a measure independent of starting positions. The gross measure itself is not entirely satisfactory because it would fail to capture excessive use of other inputs thereby raising real costs. The figure is intended to serve an illustrative purpose rather than a formally analytical one.

\textsuperscript{15}According to Soviet Finance Minister Pavlov, "One ruble invested... in heavy industry yields 84 kopeks" (Galavachev, 1989). As is usual with such statements, the underlying assumptions are not rendered explicit.

\textsuperscript{16}The capital types associated with points along this axis are also intended to be representations; the distances between them do not reflect real differences in relative costs.
the former systems to have been unsustainable as planned and instead operated as a series of isolated flexible manufacturing cells rather than as an integrated FMS.

The curve marked "USSR" illustrates the main themes. If the Soviet Union were currently at point "A," then the modernization investment program may be considered as movement to the right along the curve. If the Soviets invested enough to provide themselves with the technology represented by the horizontal coordinate of point "D," the effort would then make industrial production as efficient as possible given current institutions, practices, and incentives. To seek the "world technology frontier" by investing the additional resources required would bring the economy to a point providing less return on investment than point "D."

If the process continues from point "D" along the dotted line and achieves the world technological frontier at "E," the result will be a more effective industry in that it will produce more output per unit investment than at "A." However the outcome is not efficient: More could have been produced with a smaller outlay if the Soviets chose to modernize to a technological level better suited to the ability of industrial management to operate it ("D"). The true curve may be the solid one lying below the dotted line, and a concerted campaign to achieve the technological frontier may lead industry to "F." After making vast claims upon national income to support a modernization drive of this type, the economy would be less productive than it was formerly because of the sums required and the underdevelopment of means to efficiently utilize the ensuing capital stock.

We cannot now say which result is more likely. The true outcome of modernization may well lie in the region bounded by points "E" and "F." But Fig. 8.1 suggests that in the long run this empirical question may not be as important as it first appears. Even if the resulting outcome lies closer to "E," a modernization program conceptualized in terms of improving the quality of machinery constrains the Soviet economy to choose some solution along a "USSR" curve absolutely less efficient at every point than are the two curves lying above it. Given the relationship among the three curves, this course is not sufficient for reducing the technological lag between the Soviet Union and the industrialized West.

Modernizing investment programs must be accompanied by institutional changes to permit modernization of industry in the broadest sense. Improving the information available to enterprise managers on both external conditions and internal possibilities and increasing the authority for such decisionmakers to act upon this information while providing them

\[17\text{Indeed, differences in comparative advantage may make it more costly in real resource terms for the Soviets to keep pace with leading industrial countries while moving the same horizontal distance along the "USSR" curve as is traveled by the "USA" and "Japan" along theirs.}\]
with incentives to do so will make it possible for the existing capital stock to be rendered more productive. In the idiom of Fig. 8.1, such changes would allow Soviet industry to move from the regime represented by point “A,” to a more productive state such as those represented by “B” or even “C” without as great an outlay for new equipment. The second benefit from such a regime shift would be to make existing machinery more efficient and to make any subsequent investment in equipment of a higher technological level more efficient by yielding a higher return per unit investment.

Therefore, the question of whether perestroika's approach to technology policy yields a result that is less efficient than the ideal ("E," leading to nonoptimal resource utilization) or even less efficient than current practice ("F," a calamity if pursued as a major national investment drive) is immaterial in the long run. Even a solution deemed efficient in local Soviet terms ("D") is absolutely less efficient than the results achieved by the nations the Soviet Union is in competition with.

It may be argued, however, that the extra abilities conferred by advanced manufacturing technology may be sufficient to prevent the pre-crisis situation from worsening and the technology gap from widening, irrespective of real resource costs. Perhaps so. But the Soviets are currently in crisis because the policies of the past and the institutions of both the past and present have made the economy profligate. Goals were established by the central authorities based upon limited understanding, or in pursuit of non-economic ends; the means of achieving them have been wasteful. It is difficult to imagine that exploring new, advanced means of being in efficient will benefit the Soviet Union over the long run. Over the short run, the net result may be an increase in the overall output indicators or even an ability to produce new varieties of goods. This in itself could lead to further injury to the economy if the cost of investment in these technologies is so large that it crowds out other, perhaps even more effective, lower-cost solutions. These short run benefits could prove dearly bought indeed if they distract attention from the urgent need to overhaul the system. The value of investing in modern technology will depend ultimately on the nature of economic reforms in the Soviet Union and the extent to which they are successfully realized in practice.

\footnote{Such a move is not costless. New capital will still need to be produced and modified to better suit the needs of users, and the new insights gained by enterprise officials will need to be embodied in redesigned and better laid out plants. In addition, any shift to new institutions of economic decisionmaking will involve short-term dislocations and losses of potential output that may appear even more dramatic in a period of generally perceived shortages. Finally, there will appear to be considerable losses to those who derive rents or hold other forms of property rights within the existing economic institutions, although from an economy-wide perspective these will not be lost but rather transferred. What will be saved are the costs necessary for the horizontal move into a higher-technology regime and the gains accrued over time from shifting to a more efficient production regime.}
PRIORITY, TECHNOLOGY, AND ECONOMIC REFORM

Soviet programs such as modernization or conversion, requiring fundamental changes in resource allocation, are undercut by simplistic approaches to assigning priority and to choosing among technological alternatives. These, in turn, are engendered by insufficient means to inform investment decisions and to guide efficient use of the capital put in place. Heretofore, changes in the system have proven inadequate to affect the problems substantially.

Several crucial areas remain untouched, or have been inadequately addressed in practice, by current Soviet law:

- Reform of the price system;
- Creation of competitive markets;
- Reform of internal enterprise structure to conform with external changes;
- Removal of ministerial control over output profile decisions; and
- Providing legal guarantees to enterprises for the free exercise of their newly found rights.

The first of these is fundamental. Only when the regime of prices does a better job of conveying real resource costs will it be possible to make efficient choices between alternatives. Such a system need not be perfect, merely better than the current practice of setting administrative prices on the basis of faulty criteria.

However, a system still predicated upon central administrators setting prices, albeit using new, improved, and presumably more apposite criteria, is not sufficient. Central authorities, even with the best of wills, lack the ability to gather sufficient information and analyze it rapidly enough to achieve the goals set for a more information-laden system of prices. And, of course, such bodies may not have the best of wills; they may prove parochially short-sighted, obtuse, venal, or have a messianic zeal for a pet project. Further, market competition against potential rivals also provides instructive lessons for, and effects on, a producer that would be foregone by such a regime. Only in a competitive context can information on best practice be pooled, performance judged, and adequate motivation provided for occasionally forcing hard choices upon enterprises.

For the information generated by a greater degree of competition to be utilized adequately, enterprises must be changed into better receptors of such information. They must also be better poised to make use of it once it is received. This implies a series of transformations ranging from the simple reshuffling of internal portfolios (e.g., increasing the size and presence of marketing departments, providing for more interaction between
departments over investment decisions) to basic changes in enterprise structure by spinning off some plants into separate entities and altering the internal environment for information flows and decisionmaking. If enterprises are to be more enterprising and less responsive to command directives, they must be recast in an image that will allow greater response to new stimuli.

Part of this enlarged sphere of authority must include sovereignty over entry and exit decisions. The latter is the most problematic. Decisions over investment must come increasingly from an analysis of the type of output desired. Efficient utilization of capital implies that some activities and product lines should be emphasized over others. Indeed, it is by no means certain that all enterprises should continue to produce their present assortment. The reform proposals presented to date suggest the authority to decide such questions should fall within the province of the enterprise. This is a source for potential conflict: What is the role of the ministry when an enterprise ceases to produce a good for which the ministry is responsible? Should a ministry have the power to force an enterprise to produce something the enterprise judges to be unprofitable? The fundamental conflict over intermediate economic management—the whole elaborate ministerial structure—must be resolved if reform is to affect the quality of modernization.

All the foregoing is predicated upon a meaningful definition of property rights and a new system of law to protect those rights. This lack is the fatal flaw of the current system. Many decisions to modernize by more efficiently utilizing new manufacturing capital may, in fact, be sanctioned by law but deviate from past and current custom. If the ministry wields powers that can injure the enterprise if its perceived prerogatives are trespassed upon, the enterprise will be likely to alter its behavior to follow de facto rather than de jure practice. In such an environment, any reform decree will become a dead letter. The enterprise's legal standing with respect to the ministry must be clarified.

In the absence of a reform agenda addressing these points, the potential for improving efficiency by identifying situations where older technologies can be rendered satisfactory will be lost to the Soviet economy. With resources limited so that any advance is likely to require a good deal of assigned priority by higher organs and cost to the economy at large, the Soviets cannot be certain where to direct efforts to best advantage. This will continue to be costly; it will have serious consequences for the current campaign to divert resources from defense industry to civilian uses. The ability of enterprises and ministries to perform their roles adequately, as well as the prospects for increasing overall productivity, will hang in the balance while the fate of further radical reform remains unclear.
REFERENCES


9. GORBACHEV'S ALLOCATIVE CHOICES

Charles Wolf, Jr.

BACKGROUND

The content, progress, and prospects of economic restructuring (perestroika) in the Soviet Union confront a crucial dilemma. On the one hand, the cumulative shortcomings of state control, centralized decisionmaking, and administered prices create a compelling need for a more decentralized, market-oriented economic system. Indeed, few in the West have been as severe in deploring the existing system's shortcomings or as convincing in their advocacy of decentralization as Gorbachev himself and some of his top economic advisers.2

On the other hand, strong pressures exist to retain or even increase centralized decisionmaking and resource allocation to resolve the sharply conflicting demands for scarce resources (1) to raise personal consumption as well as quasi-public consumption in health care, education, and housing; (2) to maintain and improve Soviet transportation, communications, and distribution; (3) to reverse the deterioration of air and water quality and the damage to the Soviet natural environment; (4) to prudently reduce military spending while modernizing the armed forces; and (5) to selectively reduce expenditures on the extended, if diminishing, Soviet empire.3

This dilemma—pressure for decentralization versus pressure for centralization—is not adequately conveyed by the standard "guns versus butter" metaphor. It also involves such questions as the kinds of weapons to forgo, retain, or enhance, at what time and for what contingencies; the kinds of consumption and investment to expand and for which republics

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1This chapter is an abridged version of a RAND study, Gorbachev's Allocative Choices: Constraints, Dilemmas, and Policy Directions, R-8891-USD, September 1990, by Charles Wolf, Jr., Benjamin Zycher, Heide Phillips Shockey, and Jeannette Van Winkle.


3Aganbegyan (1989, p. 113) highlights this part of the dilemma by associating perestroika with "new spending in the social sphere, a breakaway in the provision of housing and socially necessary buildings, much greater expenditures on health and education, redoubled growth of food production, triple growth in the service sector, and vast capital and currency investments in the development of light industry."
and with what delays; and the types of subventions to Cuba, Vietnam, Afghanistan, and elsewhere that should be reduced, maintained, or even increased.

This study focuses on the second horn of Gorbachev's dilemma: the conflicting demands that create pressures for centralization. The aim is to estimate the types and magnitudes of the conflicting resource claims constraining and dividing the Soviet leadership as well as the increasingly vocal and restive Soviet populace.

The range and complexity of these conflicting allocative choices—the competition between the domestic and international ones and between the resource demands for public or collective goods on the one hand and private or personal ones on the other—are suggested by the following list:

1. Within the military, choices arise between nuclear and conventional forces, between offensive and defensive forces and strategies, and, in turn, among the five Soviet military services, between their current sizes and capabilities and their future ones, and between these forces and Soviet research and development (R&D).

2. Within the industrial sector, choices must be made among investing in (1) the defense industry, (2) expanding capacity to produce consumer goods, (3) converting defense industry to civil production, and (4) single- or dual-use (defense and civil) production capacity.

3. Within the consumption sectors, choices arise between production for personal or "private" consumption (food, clothing, household appliances, cars, etc.) and "collective" or quasi-collective consumption (health care, housing, education). Indeed, the health sector warrants special consideration both because of deterioration of health conditions in the past two decades and because of the effects of health conditions on labor productivity.

4. In the public investment sphere, difficult choices arise between equipment and construction for maintaining and improving public infrastructure in transportation, distribution, communications, and environmental quality.

5. Still other allocative issues arise in choosing among the preceding options and those involved in the crucial energy sector: whether, and to what extent, to meet the substantial resource demands for retrofitting the large number of Soviet graphite nuclear reactors in the aftermath of Chernobyl; and what to do about the rising extraction and transportation costs relating to oil, gas, and coal.
6. Finally, with respect to present and future international affairs, the Soviet leadership confronts the question of how much and how rapidly to reduce the support it has provided for extended international activities in Cuba, Vietnam, Angola, Cambodia, Mozambique, and also Afghanistan (notwithstanding the withdrawal of Soviet combat forces there).

ANALYTICAL APPROACH

Against this background, the analysis proceeds by first formulating the range of potential allocations of final output and final resource use for investment and consumption among major competing claims in the following sectors: the military, including its five services and R&D; health; housing; education; food; nonfood consumer goods and services; energy; transportation and communication; environmental protection; machinery, equipment, and construction (not already included in the previous sectors); and the costs of the extended Soviet empire. For each of these sectors, "high," "medium," and "low" estimates are made of final resource use for consumption and investment. Estimates of the competing sectoral claims are principally presented in constant rubles and, where feasible, in constant dollars in the context of alternative estimates of Soviet GNP. The aim of the separate sectoral estimates is not precise accuracy—in any case, this is fanciful to associate with Soviet economic data—but illumination of the broad character and scale of the Soviet allocative predicament.

Second, packaging the range of competing resource claims for the several end-use sectors reflects four alternative policy directions that the Soviet leadership may choose to take; a "public consumption policy" emphasizing collective or public consumption through relatively high allocations to housing, health, and education, with medium or low allocations to other sectors; a "private" or "personal consumption policy" reflecting relatively high allocations to food and nonfood consumer goods sectors, with medium or low allocations to other sectors; a "technology, capital, and infrastructure policy" reflecting medium or high allocations to infrastructure and to machinery and equipment, with low allocations to other sectors including the military; and a "military modernization policy" represented by medium allocations for the military and for the machinery, equipment, and construction sector, with low allocations to other sectors.

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3The sectoral estimates for housing, health, and education include investment and operating costs. The estimates for food and nonfood consumer goods cover final consumption. Estimates for the infrastructure sectors (energy, transportation and communication, and environmental protection) represent final investment demand. Estimates for machinery, equipment, and construction are intended to cover investment demands for defense production, consumer-goods industry, and agriculture.
Third, formulating several additional options (1) illustrates the effects of deeper military cuts and the possibility of combining austerity with reallocations and reform and (2) highlight the effects of a possibly serious decline in the economy’s near-term performance.

Finally, implications are drawn from the analysis for aggregate resource allocation policies, Soviet military spending, arms control, imports of capital and commodities, and the pace and prospects of perestroika.

GROSS NATIONAL PRODUCT, MILITARY SPENDING, AND THE MILITARY BURDEN

Soviet GNP and Soviet Statistical Problems

The size of the Soviet gross national product (GNP) constrains the allocative choices of the Soviet leadership. The GNP is equal to the sum of final resource uses (i.e., final demand)—consisting of personal or private consumption plus collective consumption (government)—plus military spending plus investment plus the balance of payments surplus on current account (or minus the current account deficit). If imports exceed exports, the other components of final resource use will exceed the GNP by the amount of this excess.

These basic relationships apply to the national accounts of all countries. When sizing the Soviet economy by applying these relationships empirically, one encounters several problems specific to the Soviet case. One problem is that the underlying Soviet statistics are unreliable and tend to be systematically biased upward. This bias follows from the incentive structure of a centrally planned economy that focuses on quantitative production norms in evaluating the performance of producing units. Moreover, this bias increases as the complexity and hence the number of reporting nodes increase.5

A second problem is the extent to which hidden inflation is overlooked or underestimated by the usual procedures for deflating value data in current prices to arrive at estimates in constant prices. In an economic system based on administered prices rather than market-based ones, hidden inflation can take the form of (1) diminished product quality for output evaluated at constant prices or (2) attribution of higher prices to products whose invoiced description involves fictitious rather than actual quality upgrading. Both types of

hidden inflation have occurred frequently and extensively in the Soviet economy in recent years.  

A third problem concerns the production of tangible, but valueless, output as a consequence of incentives faced by enterprises to satisfy quantitative production norms. Thus, to meet these norms, enterprises may produce output that is delivered to other user enterprises but that the latter regard as worthless. Examples of such valueless output abound in accounts by Soviet as well as Western writers: bulldozers delivered to construction and mining enterprises whose managers, owing to prior experience, prefer to let the equipment stand idle than to risk the consequences of fragile blades and underpowered engines; consumer appliances that not only do not work but are a safety hazard to their users; and so on.  

**GNP and Military Expenditures in 1987**

Table 9.1 shows benchmark estimates for ruble GNP for the Soviet Union in 1987, calculated by the intelligence community, as well as a breakdown of actual military expenditures by service. The problems noted above are less serious for establishing a ruble GNP estimate for a particular year than for making comparisons of GNP in constant rubles over time. However, these problems are especially serious and relevant when sizing the Soviet economy by comparing ruble GNP with its equivalent dollar GNP. The CIA has placed Soviet GNP at half, or slightly more than half, of the United States. An increasing number of Western analysts regard this estimate as unrealistically high. Indeed, the specific problems noted above pertaining to Soviet statistics would tend to lower the ratio between the Soviet GNP (in dollars) and the U.S. GNP. Consequently, Table 1 also shows an alternative estimate of Soviet GNP in dollars that is closer to a third than a half of the U.S. GNP in 1987.

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8See “The Soviet Economy in 1988: Gorbachev Changes Course,” a Central Intelligence Agency (CIA) and Defense Intelligence Agency (DIA) report, presented to the Subcommittee on National Security Economics of the Joint Economic Committee, April 1989. The CIA estimates employ the adjusted-factor cost methodology that is subject to a number of theoretical as well as other shortcomings. See Harry Rowen and Charles Wolf, Jr., “The Soviet Economic Crisis,” in Rowen and Wolf, 1990, pp. 10–12.  
Table 9.1
Estimates of Soviet GNP and Military Spending, 1987
(in billions of 1982 rubles and dollars)\(^6\)

<table>
<thead>
<tr>
<th>Category</th>
<th>Service Share Estimates</th>
<th>Alternative Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(%</td>
<td>$</td>
</tr>
<tr>
<td>GNP</td>
<td>NA</td>
<td>721</td>
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<tr>
<td>Military expenditures</td>
<td>Ground forces</td>
<td>119</td>
</tr>
<tr>
<td></td>
<td>Air forces</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Naval forces</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Air defense (PVO)</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Strategic Rocket Forces (SRF)</td>
<td>6</td>
</tr>
<tr>
<td>RDT&amp;E</td>
<td>20</td>
<td>24</td>
</tr>
</tbody>
</table>

NOTE: NA means Not Applicable.
\(^6\)For the sources and methods on which this table is based, see Wolf et al., 1990.

Inaccuracy in sizing the Soviet economy is one of the fundamental problems presented by reliance on the CIA data. Another is the incompatibility, emphasized by Dmitri Steinberg, between the CIA data covering GNP and the separately estimated military expenditure data.\(^11\) Despite these and other shortcomings, most of the following analysis draws principally on the CIA data because of their salience and familiarity rather than their reliability.

The benchmark figures for military expenditures in 1987 are derived from CIA and DIA estimates of both total expenditures and the shares of this total attributed to each of the five military services and to RDT&E. Our estimates of support costs, which were not separately attributed by the CIA and DIA to the individual services, assign these costs to the five services in accord with the shares of the respective services' expenditures for direct operations.

The estimate of the military burden (i.e., the ratio of military spending to Soviet GNP) that results from the calculation of the constant price data is slightly over 14 percent. The alternative estimates for both ruble and dollar military expenditures shown in Table 1 are based on the premise that total military outlays in 1987 were about 10 percent higher in both rubles and dollars than the base-case CIA estimates, as explained below. The CIA estimates

omit outlays for such purposes as military airlift provided by Aeroflot, naval support services provided by the merchant marine, and other military-related costs incurred by Soviet agencies other than the defense ministry and the military services. The resulting military burden estimates shown in the last two columns of Table 1 are 18.2 percent for ruble GNP and just under 21 percent for dollar GNP. If the additional costs of the extended Soviet empire are added to these strictly military expenditure estimates, the total security burden on the Soviet economy in the 1987 benchmark period would be approximately 3 percent higher as a share of the Soviet GNP.


Proceeding from the 1987 benchmark figures, Table 9.2 summarizes alternative high, medium, and low estimates for Soviet military expenditures over the next ten years.

The strategic rationale underlying these alternatives is a progressive movement away from massive, offensive, and forward-deployed conventional forces and a large land-based intercontinental ballistic missile nuclear force toward forces structured along the lines of "defensive defense," "nonprovocative defense," or "reasonable sufficiency." This altered military posture is construed to mean smaller conventional as well as nuclear forces and reduced naval and projection forces, perhaps with some degree of modernization of the smaller remaining forces. In accord with this rationale, the budget shares of the ground forces, naval forces, and Strategic Rocket Forces (SRF) vary directly with the high, medium, and low levels of military spending, while the RDT&E and Air Defense Forces' (PVO's) shares rise as the aggregate spending level declines; the air forces' share of the total remains constant for the three different spending levels, on the premise that their close support and attack roles are relatively unaffected by the doctrinal change.

The GNP projections, which ultimately impose aggregate constraints on final resource use by the military as well as by other sectors, are based on the assumption of (1) a real rate of growth from 1987 through 1995 of 1.6 percent and (2) a 2 percent annual growth rate from 1996 to 2000. These growth rates, derived from prior RAND analysis, are slightly higher than the base-case estimates in that earlier work, thereby providing an a fortiori, or upper

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12These estimates are probably on the low side. Aslund, for example, places the burden figure in a range between 22 and 30 percent. Informally, several Soviet economists concur with these high figures. Compare Aslund, 1990, p. 15.


<table>
<thead>
<tr>
<th>Category</th>
<th>1995</th>
<th></th>
<th></th>
<th>2000</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>High&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Medium&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td>High&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Medium&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Service Share (%)</td>
<td>R</td>
<td>$</td>
<td>Service Share (%)</td>
<td>R</td>
<td>$</td>
</tr>
<tr>
<td>Military Expenditures</td>
<td>129</td>
<td>266</td>
<td>119</td>
<td>246</td>
<td>98</td>
<td>203</td>
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<tr>
<td>Ground forces</td>
<td>23</td>
<td>30</td>
<td>61</td>
<td>20</td>
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<td>49</td>
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<tr>
<td>Air forces</td>
<td>22</td>
<td>28</td>
<td>59</td>
<td>22</td>
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<td>54</td>
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<tr>
<td>Naval forces</td>
<td>18</td>
<td>23</td>
<td>48</td>
<td>17</td>
<td>20</td>
<td>42</td>
</tr>
<tr>
<td>PVO</td>
<td>11</td>
<td>14</td>
<td>29</td>
<td>12</td>
<td>14</td>
<td>30</td>
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<tr>
<td>SRF</td>
<td>6</td>
<td>8</td>
<td>16</td>
<td>5</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>RDT&amp;E</td>
<td>20</td>
<td>26</td>
<td>53</td>
<td>24</td>
<td>29</td>
<td>59</td>
</tr>
</tbody>
</table>

<sup>a</sup>Estimates are based on the following GNP's: 1995 base case of $18 billion R or $238 billion; 1995 alternative of $18 billion R or $1473 billion; 2000 base case of $200 billion R or $2162 billion; 2000 alternative of $200 billion R or $1621 billion. The following does not pertain to alternative ruble GNP's. GNP estimates assume, in the base case, a real growth of 1.6 percent annually from 1987 to 1995 and 2 percent annually from 1995 to 2000 (see Table 1 and discussion in Trends, pp. 8-9). The alternative estimates for 1995 and 2000 apply the same growth rates to the alternative (lower) dollar estimates for 1987 (see Table 1).

<sup>b</sup>Defense spending is assumed to be 119 billion R and $246 billion in 1987 and to grow in real terms by 1.5 percent per year through 1996 and 2000. Service share of RDT&E is assumed to remain at 1987 proportions.

<sup>c</sup>Defense spending is assumed to remain through 1996 at the lower of the alternative levels assumed in 1987 (namely, 119 billion R and $246 billion) and to grow by 2 percent per year thereafter through 2000.

<sup>d</sup>Defense spending is assumed to decline by 25 percent by 1995 from the higher level assumed in 1987 (namely, 131 billion R and $271 billion) and to grow by 2.5 percent per year thereafter through 2000.
bound, basis for evaluating Soviet resource constraints.\textsuperscript{15} We assume the same growth rates for ruble and dollar GNP for reasons of simplicity and convenience. In fact, differences in relative dollar and ruble prices would lead to differences between the corresponding growth rates. Furthermore, these growth rates—whether in rubles or dollars—seem implausibly high in light of the poor performance of the Soviet economy since 1988, the deterioration of the consumer market, a slowdown of investment, and the pervasive social and political restiveness in the country. Nevertheless, in the context of analyzing the character and severity of resource constraints and conflicting choices facing the Soviet leadership, these probably optimistic GNP growth rates for the 1990s provide an \textit{a fortiori} context for the later discussion.

The high estimates of military expenditures for 1995 and 2000 shown in Table 9.2 are based on the benchmark estimates in Table 9.1 of military spending in 1987 (119 billion rubles and 246 billion dollars), an assumed growth of military spending in real terms of 1.5 percent per annum throughout the 1995 to 2000 period, and expenditure shares for the five military services and RDT&E shares maintained at the 1987 proportions shown in Table 9.1. Although the high estimates seem quite unlikely in mid-1990, they are included to bracket the range of possibilities. Military expenditures in the Soviet Union would only be likely to increase if “conservative,” orthodox Marxist-Leninist elements, led by Ligachev, Pugo, and Kryuchkov, were to regain control.\textsuperscript{16}

The medium estimates in Table 9.2 are based on the assumption that actual defense spending remains fixed through 1995 at the benchmark levels of 1987, with growth at an annual rate of 2 percent thereafter through 2000, with service shares changing in accord with the basic strategic rationale noted earlier: namely, the ground forces’ share decreases from 23 percent in 1987 to 20 percent in the 1990s; the air forces’ share remains at 22 percent; the naval forces’ share decreases from 18 percent in 1987 to 17 percent; POVs rises from 11 percent in 1987 to 12 percent in the 1990s; the SRF’s share decreases from 6 percent in 1987 to 5 percent in the 1990s; and the RDT&E share rises from 20 percent in 1987 to 23 percent throughout the 1990s.

Finally, the low spending estimates shown in Table 9.2 assume that military spending in 1995 declines by 25 percent from the higher ruble and dollar levels (131 billion rubles and 271 billion dollars) assumed in the alternative estimates for 1987 shown in Table 9.1,


\textsuperscript{16}Alexei Arbachev in a discussion at RAND, July 3, 1990.
thereafter growing by 2.5 percent per year from 1995 through 2000. Implicit in the 25 percent reduction is the premise that deeper percentage cuts would be more tenable, as well as more beneficial in easing the general resource tightness, if they proceed from the higher estimates of 1987 military outlays. (Still deeper cuts, as much as 80 percent below the 1987 estimates, are considered in several other options developed later.)

Again, in accord with the strategic rationale noted earlier of a Soviet shift toward smaller, defensive forces, the shares allocated to the Soviet services are assumed in the low spending estimates to change as follows: The ground forces' share falls from 23 percent in 1987 to 18 percent during the 1990s; the air forces' share remains constant at the 22 percent level of 1987; the naval forces' share decreases to 16 percent in the 1990s from 18 percent in 1987; POVs' share rises from 11 percent in 1987 to 13 percent; the SRF's share falls from 6 to 5 percent; and the RDT&E share increases to 25 percent in the 1990s from 20 percent in 1987.18

These translations of changes in Soviet declaratory policy and doctrine into changes in budget shares for the services and for RDT&E are somewhat arbitrary as well as arguable. They seem, however, to be generally consistent with the discussions and descriptions of the policy and doctrinal changes announced by the Soviet leadership.

**FINAL RESOURCE USE FOR NONMILITARY SECTORS**

**Estimation Process**

In estimating final nonmilitary resource uses, we have used adjusted sector-of-origin data as proxies for final demand according to the following procedure: (1) we use food and nonfood consumer goods production to reflect final demand for personal consumption; (2) we use health, education, and housing output to make up final demand for collective consumption as well as for investment outlays in these sectors; (3) we represent the principal investment component of final demand with investment outlays for transportation, communication, environmental protection, and the energy sector, together with a residual category of “machinery, equipment, and construction” covering investment in the defense industry, the consumer goods industry, and agriculture; (4) we use empire costs to represent

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17The 25 percent reduction assumed in this estimate exceeds the military spending reduction (i.e., 14 percent) proposed by Gorbachev and Ryzhkov in the June 1989 Congress of People's Deputies *(The New York Times*, June 8, 1989, p. 1). Moreover, the reduction proposed by Gorbachev and Ryzhkov referred to a total military spending level (77 billion current rubles) that is more than 35 percent below the 119 billion (in 1982 rubles) used in our estimates.

incremental resources expended in Soviet external activities not elsewhere covered in Soviet national accounts.

In accord with this procedure, estimates of final resource use for 1987, 1995, and 2000 have been made for nine sectors besides the military: housing, health, education, food and food products, nonfood consumer goods and services, transportation and communication, energy, environmental protection, and empire costs. A tenth sectoral estimate is included for machinery, equipment, and construction, covering investment goods that are not included in those sectors. For example, the estimates of resource use in food and food products, and in nonfood consumer goods, exclude investment outlays for expanding plant and equipment in these sectors. Allowance for this resource use is covered by the separate sectoral estimate for investment goods (machinery, equipment, construction).

The estimate for the eleven sectors—military spending; the nine nonmilitary sectors; and residual machinery, equipment, and construction—represents a combination of final output ("sector-of-origin") data and final demand data. This crosswalk between sectoral and final demand accounts is intended to highlight, at an aggregate level, the principal competing resource claims and allocative choices facing the Soviet leadership. Toward this end, the alternatives are designated in terms more directly related to potential policy decisions than are the separate final-demand accounting categories standing alone. For example, the choice between, say, housing and energy investments or between nonfood consumer goods and empire costs focuses more sharply on alternative policy options than would a choice between aggregate consumption and investment—the latter representing the standard final-demand classification.19


The first column of Table 9.3 shows benchmark estimates for 1987 (in 1982 rubles) for the ten nonmilitary sectors.20

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19In other words, the aim is not merely to present allocative choices in terms of investment versus consumption (as would the standard final-demand categories) but to focus instead on kinds of consumption (e.g., collective or personal) and kinds of investment (e.g., transportation, energy, other machinery, equipment, and construction). By the same token, use of only the standard sector-of-origin classification would overlook allocative choices relating to military policy and foreign policy (empire costs)—categories that are excluded from the sector-of-origin categories. Combining sector-of-origin and final demand categories, as we have done in the sectoral estimates, entails some risk of double counting due to intermediate output by some sectors (e.g., energy) for use by other sectors (e.g., consumer-goods production). However, the extent of this potential error is small because the energy sector's estimate in Table 9.3 represents only that sector's investment outlays, whereas the estimate for the other principal sector producing intermediate outputs—transportation (which includes both its investment and operating outlays)—is only a minor component of the outputs of the other sectors as they are estimated in Table 9.3.

20It was originally intended that dollar as well as ruble estimates for the sectors be included, as is done for the military services and GNP estimates shown in Tables 9.1 and 9.2. This intention was
Table 9.3

(in billions of 1982 rubles)\footnote{a}

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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Military expenditures</td>
<td>119</td>
<td>129</td>
<td>119</td>
<td>98</td>
<td>139</td>
<td>131</td>
<td>110</td>
<td></td>
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<tr>
<td>Housing</td>
<td>39</td>
<td>71</td>
<td>64</td>
<td>53</td>
<td>83</td>
<td>75</td>
<td>62</td>
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<td>Education</td>
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<td>87</td>
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<td>49</td>
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<td></td>
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<tr>
<td>Food</td>
<td>170</td>
<td>265</td>
<td>236</td>
<td>220</td>
<td>308</td>
<td>264</td>
<td>239</td>
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</tr>
<tr>
<td>Nonfood</td>
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<td>375</td>
<td>303</td>
<td>244</td>
<td>503</td>
<td>386</td>
<td>265</td>
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<td>7</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Machinery, equipment construction (NEI)</td>
<td>70</td>
<td>92</td>
<td>84</td>
<td>79</td>
<td>117</td>
<td>97</td>
<td>88</td>
<td></td>
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</tr>
<tr>
<td>Empire costs</td>
<td>14</td>
<td>24</td>
<td>16</td>
<td>8</td>
<td>27</td>
<td>18</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>721</strong></td>
<td><strong>1164</strong></td>
<td><strong>987</strong></td>
<td><strong>840</strong></td>
<td><strong>1454</strong></td>
<td><strong>1142</strong></td>
<td><strong>920</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\footnote{NOTE: NEI means Not Elsewhere Included.}

\footnote{aFor the sources and methods on which the table is based, see Wolf et al., 1990.}

The remaining rows and columns of Table 9.3 present estimates of final demands for sectoral resource uses for 1995 and 2000 for the other nonmilitary sectors including the costs of empire.

In formulating high, medium, and low estimates of final demand for the nonmilitary sectors, an eclectic method has been used for all sectors, together with certain adjustments that were warranted by special data and other circumstances pertaining to the individual sectors. These adjustments are described and explained in the supporting studies of particular sectors that were made as part of the overall project.\footnote{21See Heide Phillips Shackle, Final Resource Use of Consumption Sectors in the Soviet Union through 2000, RAND, N-3162-USD, 1991; and Jeannette VanWinkle and Benjamin Zycher, Future Soviet Investment in Transportation, Energy, and Environmental Protection, RAND, N-3173-USD, 1991.}
The draft of the 13th Soviet Five-Year Plan for 1991–1995 has provided a source of inputs for these estimates. However, its periodic and inconclusive revisions, variously emphasizing machine-building or alternatively consumer goods and conversion of defense industry, make the plan an unreliable basis for sectoral forecasts in the 1990s.

Our general method is to base the low estimate for the various sectors on recent trends in actual resources absorbed by these sectors, for the 1970–1984 or the 1980–1986 period as appropriate, and then to use these trends as a basis for extrapolation to the 1995 and 2000 time periods. For example, if a particular sector's final resource use grew by 1 or 2 percent in real terms during the reference period, this rate has been used to make the low estimate for that sector for 1995 and 2000.

By contrast, the high estimates shown in Table 9.3 are based on, or inferred from, several different sources: statements of intentions, goals, and demands by various Soviet leaders—Gorbachev, Ligachev, Shevardnadze, Ryzhkov, and others—as expressed in Party Plenums of 1986, 1987, and 1988; preparatory documents for the 13th five-year plan; the record of debates in the 1989 Congress of People's deputies; and other sources identified in the supporting sectoral studies for this project. Of course, these sources reflect varying mixtures of hope, hyperbole, and honesty.

For example, Ligachev called for doubling investments in the education sector between 1990 and 2000, Health Minister Chazov repeatedly pledged a tripling of the health budget by 2000, etc. Estimates for housing are based on goals envisaged by the Party Plenums (e.g., "a separate apartment or flat for every family by 2000," or "a separate room for every person"), translated into square meters and costed.

Estimates for the transportation and communication sectors rely principally on prior work by Holland Hunter and Vladimir Kontorovich. Estimates for environmental protection draw on prior work by Tikhonov and Zumbrunnen. Estimates of future energy investment, including investment required for nuclear-safety retrofits for graphite reactors, are based on a combination of Soviet reports and comparable U.S. experience.

Finally, the medium estimates are judgmentally based between high and low, although not necessarily representing the mean.

Thus, the separate sectoral estimates highlight plans, goals, and prospects that can be derived or inferred by the various means described above. The GNP estimates for 1996 and 2000, estimated independently of the sectoral figures, constitute what can be viewed as a

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"budget line" or envelope constraining sectoral final demand. Because the actual totals of sectoral resource uses for 1995 and 2000 must ultimately fit within the GNP level of resource availabilities, gaps between the sectoral and GNP estimates indicate the severity of the resource bind confronted by the Soviet leaders and the difficult allocative choices they face.

**Collective Consumption: Housing, Health, Education.** As Table 9.3 indicates, the high estimates for aggregate collective or quasi-collective consumption in housing, health, and education in 1995, expressed in 1982 rubles, are approximately 98 percent above the benchmark estimates of 1987. This goal seems unlikely to be reached in light of the deprivation of these sectors, which continued through the 1980s.

The low estimates in Table 9.3 for these consumption sectors would be 41 percent above the 1987 figures, reflecting an annual compound growth rate in these sectors of over 4 percent.

The estimates of final resource use for these sectors include capital formation and construction costs, as well as operating costs.

**Private Consumption: Food and Nonfood Consumer Goods.** As Table 9.3 indicates, the high ruble estimates for 1995 (640 billion) for private consumption of food and nonfood consumer goods would represent a 78 percent increase over the 1987 benchmark figures for these final demand sectors, again reflecting unrealistically ambitious and optimistic statements of targets and goals by the leadership; the low 1995 estimates (464 billion rubles) still represent a 29 percent increase over the 1987 corresponding figures, a 3 percent annual compound rate of growth in private consumption (and perhaps 2 percent in per capita consumption). For 2000, the high estimates in Table 9.3 for private consumption imply a further increase of 27 percent over the 1995 estimates, while the low estimates represent an 8.6 percent increase over the corresponding figure in 1995.25

The estimates for these sectors are confined to final consumption demand and do not include their investment and construction outlays, which are instead allowed for in the machinery, equipment, and construction sector referred to below.

**Energy, Transportation and Communication, and Environmental Protection.** These principal infrastructure sectors are also important claimants on resource use for investment in the Soviet Union, if less obvious ones than the consumption sectors.26 The estimates for the infrastructure sectors include investment and construction costs as well as their maintenance costs. The energy sector's special importance also reflects its vital export

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26 Inclusion of energy as an "infrastructure" sector is based on its role as an input to other final-demand sectors.
role as the main source of hard-currency foreign exchange in the Soviet Union. In addition, the sector's growth reflects the rising costs of extraction, which the Soviets are encountering.

Transportation, communication, and environmental protection are also high-priority elements because they have experienced severe neglect and deterioration in the past two decades. Moreover, whether these sectors—perhaps especially the transportation and communication sector—are repaired and upgraded, or instead continue to be neglected, will have serious repercussions throughout the economy.

High estimates for these three infrastructure sectors shown in Table 9.3 total 105 billion rubles in 1995. This would represent an unrealistically large increase of 50 percent over the 1987 figure, whereas the low estimate for 1995 represents a 4 percent decrease below the 1987 figure. The corresponding high estimates for 2000 represent an additional 39 percent increase over the 1995 figure, while the low estimate shown in Table 9.3 would be a 16.5 percent increase above the corresponding 1995 figure.27

Regarding environmental protection, deflation of official Soviet figures on capital investment and operations and maintenance for 1987 results in the apparent anomaly that the estimates of environmental spending are unchanged between 1995 and 2000 because the rate of growth in nominal ruble spending is equal to the assumed rate of inflation.

Machinery, Equipment, and Construction Not Elsewhere Included. The investment components of final resource use in the three infrastructure sectors and the three collective consumption sectors (health, housing, and education) are already included in the final resource-use estimates for those sectors. Consequently, the estimates in Table 9.3 for the sector denoted as “machinery, equipment, and construction (NEC)” cover only the investment component of the other four sectors: namely, defense industry, food and food products (including agriculture), nonfood consumer-goods production, and the external empire. This estimate also includes investment goods for the “machinery, equipment, and construction” residual sector itself: that is, producers’ durable goods added to the stock of capital for production in this sector.

Estimates are based on the following assumptions: (1) output of machine-building, metal-working (MBMW) and construction is divided equally between the included and excluded sectors;28 (2) in 1987, the total output of MBMW and construction was 139 billion 1982 rubles (see CIA, “GNP by Sector of Origin” [at factor cost], Table 11) or $250 billion

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28 This assumption seems reasonable in light of the actual resource use data for 1987 (see CIA/DIA, The Soviet Economy in 1988, 1989, 1990). Indeed, this assumption is more likely to err on the side of underestimating the share of total investment demand in these sectors and overestimating that for the infrastructure and collective consumption sectors than it is to err in the reverse direction.
1982 dollars (see Table 9.1 for implicit ruble/dollar ratio of 0.555 in alternative GNP estimate); (3) between 1987 and 1990, MBMW and construction are assumed to grow in real terms by 1 percent per year to 144 billion rubles (258 billion 1982 dollars), divided as indicated in assumption 1 above; (4) between 1990 and 2000, the low estimate assumes the growth of MBMW to be 2 percent per year; the medium estimate assumes 3 percent per year, and the high estimate assumes (a most unlikely) 5 percent per year.

Costs of Empire. Through the early 1980s, the costs of the Soviet empire—reflecting resource use for the Soviet Union's extended international activities that is not otherwise covered by our estimates of the other sectors' final demands—were estimated at approximately 3 to 4 percent of Soviet GNP. The benchmark figure shown in Table 9.3 assumes that, by 1987, empire costs had decreased to 2 percent of the Soviet GNP. Thereafter, the low, medium, and high estimates shown in Table 9.3 for 1995 and 2000 assume annual rates of real growth in empire costs of 1, 2, and 3 percent, respectively, of GNP. This results in a further decline in the empire's cost share of Soviet GNP in the low case because Soviet GNP is assumed to grow at more rapid rates.

These costs include Soviet foreign economic aid, unrequired exports to Eastern Europe (if any remain after 1990), Cuba, Vietnam, North Korea, Afghanistan, and other parts of the extended if diminishing Soviet empire—whether these unrequired exports are financed by grants, subsidized loans, underpricing of Soviet exports, or overpricing of imports; net military foreign aid; and the costs of Soviet foreign bases and covert operations. Net exports from the other ten sectors are implicitly assumed to be included in the estimates of empire costs.

As was the case with the military spending estimates referred to earlier, these empire cost estimates seem higher and less probable in 1990 than when they were originally made in 1989. They are included here to provide a wide range for consideration. Substantially deeper cuts (from 50 percent to complete elimination) are considered in several other options developed later in this study.

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30Ibid.
31Ibid. An example of export underpricing is oil shipments from the Soviet Union to Vietnam, representing an opportunity cost in terms of forgone Soviet national product. An example of import overpricing is the premium the Soviets pay for Cuban sugar imports, representing a further Cuban claim on Soviet oil or other resources.
32Ibid.
ALTERNATIVE POLICY CHOICES

Purpose and Content

Our principal purpose in formulating allocative options from the foregoing estimates is to illustrate and highlight the policy choices and conflicting claims facing the Soviet leadership, to suggest the constraints impinging on these choices, and to provide a basis for evaluating Soviet actions and policy statements in the coming years.

Usually policy choices are reflected both by actions—which may or may not be observable—and by declaratory statements describing those actions. Of course, declaratory statements may not be exactly congruent with actions for several possible reasons: first, statements may be anticipatory of actions yet to be taken (e.g., Soviet statements over the last few years concerning an intended expansion of the consumer-goods supply); second, the actions that correspond to declaratory statements may not be clearly or fully observable (e.g., reductions in Soviet offensive forces); or third, the statements may be deliberately intended to mislead (e.g., statements about the predominantly, if not exclusively, nonmilitary uses of Soviet space programs and the oft-repeated denial by the Soviets that the Krasnoyarsk radar violated the antiballistic missile treaty—a denial that was disavowed in 1989).

Four Allocative Options

The sectoral estimates described above and summarized in Tables 9.2 and 9.3 are used as building blocks to construct packages of alternative allocative directions and policy choices. These packages represent directions that the leadership, presumably in conjunction with the Supreme Soviet, might choose within the ultimate constraint imposed by the estimates previously made of Soviet GNP in 1995 and 2000. Table 9.4 summarizes four packages. The building blocks can be used to construct numerous others.

Table 9.4 shows two types of consumption policy that the leadership might select. Consumption Policy I emphasizes collective and quasi-collective consumption. It comprises the high final demands for housing, health, and education referred to in Table 9.3 and combines these with medium allocations for food and nonfood consumer goods and with low allocations for the military, the infrastructure sectors, machinery, equipment, and construction, and the Soviet empire. Policy I generates final demands of 965 billion rubles in 1995 and 1124 billion rubles in 2000, thereby exceeding estimated available resources (GNP) in those years by 18 and 25 percent, respectively.

Consumption Policy II reverses the consumption emphasis, opting instead for high allocations for the food and nonfood consumption sectors, medium allocations for housing, health, and education, and maintaining the low estimates of final demand for other sectors.
Policy II generates final demands of 1041 billion rubles in 1995 and 1263 billion rubles in
2000, exceeding the GNP “budget line” in those years by 27 and 40 percent, respectively.

The third policy summarized in Table 9.4, “Investment and Infrastructure,”
emphasizes (1) capital investment and (2) repair and rebuilding of the Soviet infrastructure.
As a reflection of this stance, Policy III consists of high sectoral allocations for machinery,
equipment, and construction; medium final demand for energy, transportation and
communication, and environmental protection; and low allocations for final resource use by
all other sectors. Policy III generates final resource demands of 866 and 970 billion rubles in
1995 and 2000, respectively—thereby exceeding resource availabilities in those years by 6
and 8 percent, respectively.

Policy IV in Table 9.4, “Military Modernization,” opts for medium resource allocations
to the military as well as to the machinery, equipment, and construction sector, while
confining all other sectors to the low estimates shown in Tables 9.2 and 9.3. This policy
would generate final demands in 1995 and 2000 that would exceed the corresponding GNPs
by about 6 percent in both years.

Several additional allocation policies, calling for deeper cuts in military and empire
spending, are considered later in the study.

The method used to construct our policy alternatives probably involves some
underestimation of the actual resource costs associated with each of them because, as
specified in a particular option, the interindustry demands created by a high allocation to one
sector might thereby boost demands in another sector above the low allocation. For example,
the collective and personal consumption policies would probably boost demands for the
machinery, equipment, and construction sector somewhat above the low level assigned to
that sector in these options. However, any underestimation is likely to be relatively small
and probably concentrated in the two consumption options. Moreover, biasing the estimates
downward represents an a fortiori procedure in view of the study’s aim: namely, to evaluate
the consistency between the separate policy alternatives and the Soviet economy’s aggregate
size and growth prospects.

Recalling our earlier comments about the relation between declaratory statements and
actions, we note that each of the four illustrative packages reflects, and is consistent with,
various and sometimes conflicting policy statements by the leadership. Even the military
modernization option, while at variance with some recent Soviet policy statements, recalls
the admonitions and advocacy of Marshall Ogarkov in the early 1980s. Moreover, the types
of force modernization that this option would allow could quite conceivably be reconciled with
### Table 9.4

Four Soviet Allocative Options: 1995, 2000
(in billions of 1982 rubles)\(^6\)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Consumption Policy I (collective consumption)</th>
<th>Consumption Policy II (personal consumption)</th>
<th>Investment and Infrastructure Policy III</th>
<th>Military Modernization Policy IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Military expenditures</td>
<td>Low</td>
<td>98</td>
<td>110</td>
<td>Low</td>
</tr>
<tr>
<td>Housing</td>
<td>High</td>
<td>71</td>
<td>86</td>
<td>Med</td>
</tr>
<tr>
<td>Health</td>
<td>High</td>
<td>35</td>
<td>47</td>
<td>Med</td>
</tr>
<tr>
<td>Education</td>
<td>High</td>
<td>68</td>
<td>87</td>
<td>Med</td>
</tr>
<tr>
<td>Consumer goods</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td>Med</td>
<td>236</td>
<td>264</td>
<td>High</td>
</tr>
<tr>
<td>Nonfood</td>
<td>Med</td>
<td>303</td>
<td>366</td>
<td>High</td>
</tr>
<tr>
<td>Energy</td>
<td>Low</td>
<td>28</td>
<td>31</td>
<td>Low</td>
</tr>
<tr>
<td>Transportation and communication</td>
<td>Low</td>
<td>32</td>
<td>32</td>
<td>Low</td>
</tr>
<tr>
<td>Environmental protection</td>
<td>Low</td>
<td>7</td>
<td>7</td>
<td>Low</td>
</tr>
<tr>
<td>Machinery, equipment</td>
<td>Low</td>
<td>79</td>
<td>88</td>
<td>Low</td>
</tr>
<tr>
<td>construction (NIC)</td>
<td>Low</td>
<td>8</td>
<td>9</td>
<td>Low</td>
</tr>
<tr>
<td>Empire costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>NA</td>
<td>965</td>
<td>1127</td>
<td>NA</td>
</tr>
</tbody>
</table>

**NOTE:** NA means Does Not Apply.

\(^6\)See Table 9.3 for ruble and dollar estimates corresponding to high, medium, and low designators. Also see Table 9.3 for ruble GNP estimates. Figures are based on a 1995 Soviet GNP of 818 billion 1982 rubles, and a 2000 Soviet GNP of 900 billion 1982 rubles.
the recent policy statements by Gorbachev, Ryzhkov, and Shevardnadze calling for reductions in forces and total military spending.\footnote{See the extensive discussion by Azrael (1987, especially pp. 47-59) of the conflict between the Soviet civilian leadership and the military high command, especially the recent episodes in that story.}

Evidence pertinent to each of the four options shown in Table 9.4 should, in principle, be observable in the coming years. Hence, tracking the investment and expenditure patterns corresponding to these options should lead to more informed judgments by the United States about which directions, or which combinations and compromises, are actually being chosen or made by Soviet decisionmakers during the next several years.

**Options with Deeper Military Cuts**

As noted earlier, the sectoral building blocks of Tables 9.2 and 9.3 can be used to construct additional possibilities that may be considered by the leadership and other participants in Soviet decisionmaking, or those possibilities may ensue by force majeure: that is, by the severity of resource constraints that largely determine the outcome by sharply delimiting choice.

As an indication of the severity of the Soviets' aggregate resource constraints, consider the scope that would be provided for sectoral reallocations if maximum cuts were made in Soviet military and empire spending.

Table 9.5 illustrates two such cases. In Policy V, "Deep Military Cuts, Medium Sectoral Reallocations," military spending in 1995 has been reduced by 80 percent from the 1987 figure (82 percent from the higher-alternative level of 131 billion rubles shown in Table 9.1), and all empire costs have been eliminated. Nevertheless, the GNP "savings" (14 percent of the 1987 level) are insufficient to allow reallocation to the medium estimates for the collective consumption, personal consumption, infrastructure, and other investment sectors.

The total resource demands (876 billion rubles) for this hypothetical reallocation in 1995 exceed the estimated GNP (818 billion rubles) by 7 percent.

Table 9.5 also illustrates another option, Policy VI, in which deep military cuts (62 percent below 1987 levels) and elimination of empire burdens are linked with reallocations to all other sectors at their corresponding low targets for 1995. The reductions called for in Policy VI would enable the low targets for the consumption, infrastructure, and capital investment sectors to be realized. Total final demands (779 billion rubles) would be within the GNP "budget line" (818 billion rubles) in 1995.
Table 9.5
Sectoral Reallocation with Deep Military 
and Empire Reductions: 1987, 1995 
(in billions of 1982 rubles)\textsuperscript{a}

<table>
<thead>
<tr>
<th>Sector</th>
<th>1987 Level Spending</th>
<th>Policy V: Deep Military Cuts, Medium Sectoral Reallocations</th>
<th>Policy VI: Deep Military Cuts, Low Sectoral Reallocations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collective consumption</td>
<td>88</td>
<td>149</td>
<td>124</td>
</tr>
<tr>
<td>Personal consumption</td>
<td>360</td>
<td>539</td>
<td>464</td>
</tr>
<tr>
<td>Infrastructure and other capital investment</td>
<td>140</td>
<td>164</td>
<td>146</td>
</tr>
<tr>
<td>Military</td>
<td>119 (131)\textsuperscript{b}</td>
<td>24</td>
<td>45</td>
</tr>
<tr>
<td>Empire</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>721</td>
<td>876</td>
<td>779</td>
</tr>
</tbody>
</table>

\textsuperscript{a}Figures are based on a 1987 GNP of 721 billion 1982 rubles and a 1995 GNP of 818 billion 1982 rubles.

\textsuperscript{b}The alternative military-spending estimate of 131 billion 1982 rubles is from Table 9.2.

Austerity, Reallocation, and Reform

None of the previous options has envisaged the release of substantial resources for allocation by free-market forces. However, a genuine reform effort along this line could be pursued by selecting only one or two of the collective or public-goods sectors for emphasis, enforcing rigorous austerity for the remainder, imposing sharp reductions on military and empire spending, and releasing the remaining resources for allocation by the market.

Table 9.6 illustrates this option. Policy VII consists of rolling back most of the sectoral allocations to their 1987 levels ("austerity") but according preferential treatment to two sectors ("reallocation"). One of the sectors falls under collective consumption (e.g., housing, selected because of the severe deprivation of housing facilities in the past) and one under infrastructure (e.g., transportation and communication, selected because of this sector's especially critical, accumulated shortfalls in rolling stock and maintenance). This cuts military and empire costs by 50 percent below 1987 levels and releases for market reallocation a volume of resources ("reform") of about 473 billion rubles—approximately the level of the low targets for food and consumer goods in 1995. Thus, in Policy VII, the resources released for market reallocation are simply the residual after allowing for rollbacks and reallocations among the other sectors. The scale of the released resources—58 percent of the GNP—would be sufficiently large to generate the market-based signals (namely, factor
Table 9.6
Austerity, Reallocation, and Reform: Policy VII
(in billions of 1982 rubles)

<table>
<thead>
<tr>
<th>Category</th>
<th>1987</th>
<th>1995</th>
</tr>
</thead>
<tbody>
<tr>
<td>GNP</td>
<td>721</td>
<td>818</td>
</tr>
<tr>
<td>Housing</td>
<td>39</td>
<td>71 (High)</td>
</tr>
<tr>
<td>Health</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Educationa</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Food</td>
<td>170</td>
<td>470b</td>
</tr>
<tr>
<td>Nonfood consumer goods</td>
<td>190</td>
<td></td>
</tr>
<tr>
<td>Energy</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Transportation and communication</td>
<td>38</td>
<td>56c</td>
</tr>
<tr>
<td>Environmental protection</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Machinery, equipment, constructiond</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Military</td>
<td>119</td>
<td>60</td>
</tr>
<tr>
<td>Empire</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td><strong>Sectoral Totals</strong></td>
<td><strong>721</strong></td>
<td><strong>818</strong></td>
</tr>
</tbody>
</table>

aHousing, health, and education subtotal for 1995 is 120.
bResources released for market allocation, for both food and nonfood consumer goods.
cThis hypothetical reallocation exceeds the nominal high estimate for this sector by 20 billion rubles on the premise that increased investment on this scale would be warranted to compensate for the pervasive deterioration of the rolling stock and the economy’s entire distribution system.
dInfrastructure subtotal for 1995 is 158.

prices and product prices) necessary to move the Soviet system toward economically "rational" resource uses.

Hence, as Table 9.6 indicates, Policy VII, like Policy VI, is “feasible” in the sense that sectoral resource demands equal GNP.

A Plausible Pessimistic Scenario

The preceding policies adopt the macroeconomic scenario summarized in Table 9.2: namely, GNP estimates that assume 1.6 percent growth through 1995 and 2 percent from 1996 to 2000. These assumptions are perhaps unrealistic in light of the Soviet economy’s evident decline in recent years. Another scenario, that is probably both more realistic and more pessimistic, can be developed by varying these assumptions along the following lines:

1. Between 1987 and 1991, Soviet GNP may have declined by as much as 25 percent—for example, decreasing by 5 percent between 1987 and 1989, 10
percent in 1990, and another 10 percent in 1991—as a result of both internal political disarray and inadequacy of attempted economic reform.

2. From 1992 to 1997, GNP may stabilize and then resume a growth of, say, 2 percent annually as a result of more settled political conditions and some progress with economic reform measures.

Associated with this macroeconomic scenario, an illustrative policy for the various sectors can be composed of the following further assumptions:

1. Reducing the military sector in 1995 by 50 percent below the 1987 level,
2. Reducing empire outlays by about 70 percent below the 1987 level,
3. Setting the other nine sectors at the low sectoral estimates shown in Table 9.3 or, alternatively, rolling them back to their corresponding 1987 levels.

The point of this exercise is to examine how acute the situation would become, and how severe Gorbachev’s constraints would be, if the economy’s performance were as poor as this scenario assumes. The results of these calculations are summarized in Table 9.7.

If a scenario as adverse as that envisaged in Table 9.7 were to occur, the predicament of Gorbachev or his successors would indeed be dire. The sectoral investment and

<table>
<thead>
<tr>
<th>Table 9.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>(In billions of 1982 rubles)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>1987</th>
<th>1995</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>GNP</td>
<td>727</td>
<td>656</td>
<td>589</td>
</tr>
<tr>
<td>Military</td>
<td>119</td>
<td>66</td>
<td>66</td>
</tr>
<tr>
<td>Military</td>
<td>119 (131)</td>
<td>66</td>
<td>66</td>
</tr>
<tr>
<td>Empire</td>
<td>14</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Sector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collective consumption</td>
<td>88</td>
<td>124</td>
<td>83</td>
</tr>
<tr>
<td>Personal consumption</td>
<td>360</td>
<td>464</td>
<td>360</td>
</tr>
<tr>
<td>Infrastructure and other capital investment</td>
<td>140</td>
<td>146</td>
<td>140</td>
</tr>
<tr>
<td>Totals (including military and empire costs)</td>
<td>804</td>
<td>658</td>
<td>871</td>
</tr>
</tbody>
</table>

NOTE: Option A assumes that sectoral allocations are set at the low levels shown in Table 9.3, whereas Option B assumes that sectoral allocations are rolled back to their 1987 levels.

aThe alternative military-spending estimate of 131 billion 1982 rubles is from Table 9.1.
consumption levels of 1987 would exceed the estimated 1995 GNP by nearly 19 percent (658 versus 555 billion rubles), requiring even deeper cuts in sectoral and military resource allocations. By 2000, after modest GNP growth had resumed, the 1987 level of sectoral resource claims would still exceed GNP by nearly 12 percent (658 versus 589 billion rubles).

Assuming a continued GNP growth of 2 percent annually, the 1987 levels of total sectoral resource use would be reached in 2005.

Implications of the Allocative Alternatives

Several significant inferences can be drawn from the options described in Tables 9.4 through 9.7 and the accompanying figures.

1. The initial four allocative policies summarized in Table 9.4 exceed the prior ruble estimates of Soviet GNP by amounts that vary from 6 to 40 percent of Soviet GNP. Three possible explanations or implications, or some combination of them, would account for the disparity: Soviet imports and loans may bridge some of the gap; our GNP estimates may be too low; or—most likely—the sectoral estimates, even for the low targets, may be unattainable.

2. Moreover, if military spending were cut more deeply—by nearly two-thirds in Policy V and by one-half in Policy VI—and empire costs were also severely reduced, only modest goals for the nonmilitary sectors could be realized. Thus, pressures to reduce military spending are and will be intense, although the resource savings derived from this source will still not be sufficient to meet the high sectoral demands associated with other policy objectives. For example, the 25 percent cut in 1987 military spending shown in Tables 9.2 and 9.4 would still leave Policy I “short” by 185 billion rubles (23 percent of Soviet GNP). Were 1987 military spending to be cut even further—say, by 50 percent by 1995—Policy I would still be short by 152 billion rubles or 19 percent of GNP. However, cuts of this magnitude—coupled with elimination of empire costs, as in Policy VI—would allow the low targets of the other sectors to be reached by 1995.

3. A corollary of the preceding points is that Soviet motivation for arms-control measures that involve genuine force reductions and real resource savings in operating and investment costs is and will be powerful. A second corollary is that the Soviets are likely to increase emphasis in the next few years on the (1)
production of consumer goods by the defense industry and (2) large-scale conversion of the defense industry for civil production.\textsuperscript{34}

4. A substantial disparity remains between the resource requirements associated with most of the alternative policies and the resource availability needed to effect these policies. Under most of the policies, reallocations among sectors could contribute more resources, but they would not be sufficient to resolve the resource-availability problem. A corollary of this point is that Soviet interest in substantial external financing to fund commodity imports may be very high—in the neighborhood of several hundred billion dollars—in the next decade. For example, even with the 25 percent cut in military spending reflected in the low military option, the 185 billion ruble excess of final resource use represented by Policy I, and the 249 billion ruble excess represented by Policy II, would require foreign financing and an annual import surplus of over 100 billion dollars in 1995 to bridge the implied resource gap.

5. Pressure will continue and intensify to reduce subventions to members and associates of the extended Soviet empire. From the low estimates of empire costs, embodied in four of the policy packages, we infer substantial reductions (about 40 percent) from the 1987 levels expended for Cuba, Vietnam, Afghanistan, North Korea, and in Soviet activities elsewhere in the Third World. Still deeper cuts are reflected in Policies V through VII; in two of them (Policies V and VI), empire costs are eliminated.

6. All of the previous estimates proceed from the premise that the Soviet economy will experience slow but positive GNP growth (between 1.6 and 2 percent) between 1987 and 2000. If, as seems more likely, substantially negative growth ensues at least through the early 1990s, as shown in Table 9.7, sectoral resource availabilities would decline well below their 1987 levels, notwithstanding deep cuts in military and empire spending.

7. As it becomes unambiguously clear to Soviet leaders that their declared objectives cannot be realized by centrally determined resource shifts and reallocations, the dilemma posed at the outset—pressure for centralized allocative decisionmaking versus pressure for decentralization and fundamental systemic reform—will intensify. Ultimately, easing of the aggregate resource constraints depends on a more decentralized, genuinely market-oriented reform.

One might surmise, from this line of reasoning, that the argument for and advocacy of a radical reinterpretation of perestroika will grow because it offers the way of eventually resolving the dilemma. As suggested earlier, Policy VII represents a move in this direction by combining several ingredients: "austerity," in rolling back to 1987 levels most of the investment and consumption sectors to 1987 levels; "reallocation," in according preferential treatment to the housing and transportation/communication sectors; and "reform," in releasing the remaining resources for market-based uses in producing food and nonfood consumer goods.
10. SECURITY DIMENSIONS OF SOVIET FOREIGN TRADE

Abraham S. Becker

INTRODUCTION

Security concerns with respect to their implications for economic interchange have been basic issues for both East and West. For Moscow the concern goes back to the immediate aftermath of the Bolshevik Revolution, when a state monopoly over foreign trade was established to protect the infant state from Western “imperialism.” The rationale for continuing the state monopoly over the following seven decades has always included a strong security component. For the West security became preeminent after World War II, when the Soviet Union was perceived as both a first-rank military power and a committed adversary. In response the United States and the West developed a set of controls on exports to the communist countries and from time to time interfered with trade flows to try to achieve particular foreign policy goals.

In the last few years the external and internal behavior of the Soviet Union appears to have changed sharply; Eastern Europe is extricating itself from the Soviet grip and is on the way to assuming a new and individual identity; and shoots of political pluralism and democratic process are beginning to take root in the Soviet Union. Under these circumstances it is appropriate to reexamine our perspective on the security dimensions of Soviet foreign trade. This paper is a preliminary attempt at such a reexamination, presenting a skeletal structure that will be filled in at a later opportunity.

The principal question raised by this topic is that of the economic contribution of Soviet foreign trade to the quantitative and qualitative upgrading of Soviet military power. This broad general issue in turn appears to encompass three main subheadings:

1. How and to what extent do overall Soviet gains from trade, if any, accrue to the military sector?
2. What benefits does the military sector obtain from specific categories and forms of trade?
3. Does trade impose any costs on defense capability?

These component issues of the overall question are treated in turn in the following three subsections. The final subsection raises some political considerations regarding trade and security.
AGGREGATE GAINS FROM TRADE

Unless one believes that Soviet trade patterns have developed in accordance with, if not indeed in response to, comparative advantage, the existence of net gains from trade cannot be taken for granted. In fact Soviet trade policy and behavior appear to differ in the three chief arenas of Soviet foreign economic relations—CMEA, industrially developed countries, and non-communist developing countries. The task of calculating these gains is formidable. It is, however, evident that in the 1970s and first part of the 1980s: (1) the USSR enjoyed a large windfall profit on its exports to the West because of the explosion of oil prices; (2) that windfall was wasted to a considerable extent by an inefficient foreign trade apparatus and the inability of Soviet industry to use effectively the Western technology bought in partial exchange (see below); (3) continued Soviet supply of fuel and other raw materials to CMEA countries in return for machinery and manufactured goods involved a substantial implicit net subsidy to Eastern Europe, owing to the difference between bloc and world market prices; and (4) sales of arms to Third World non-communist countries increasingly earns IOUs, instead of hard currency or even “hard” goods, that are unlikely to be repaid to any significant degree.

In the past five years, Gorbachev has had the bad luck to preside over a period of declining oil prices, a generally soft dollar and relatively high food prices in the world market, all of which have cut Soviet net revenues from trade with the hard currency world. The implicit subsidies to Eastern Europe on export account may have turned negative, given the CMEA pricing formula and sharp declines (through 1988) in world oil prices. Moscow nevertheless seems intent on changing the pricing rules of the game in CMEA to demand convertible currency prices and payments, in order to increase the real return on its huge oil and gas supplies to Eastern Europe but perhaps also because CMEA prices considerably overvalue East European machinery and manufactures. Reform of the foreign trade apparatus in the last few years has resulted, among other things, in a proliferation of trade decisionmakers. Soviet writers suggest that the liberalization has resulted in considerable losses, at least in a gross measure, due to inexperience and lack of information but also loss of monopoly power enjoyed by the previous large trading entities. Largely as a reaction to domestic goods shortages, the government has instituted (March 1989) and then extended (December 1989) a system of foreign trade licensing. These restrictions cut Soviet export possibilities and thereby also its import capability.

The impressionistic conclusion from this condensed summary of a complex history is that over the past two decades the Soviet Union has managed neither to earn substantial gains from its foreign trade nor to exploit its single consequential stroke of good fortune.
This refers to economic gains. It may be argued that Soviet trade should also be viewed in political-strategic terms, a perspective which, for example, may be used to interpret the implicit trade subsidies to Eastern Europe as a necessary cost of making strategic gains. In the same light, Soviet trade with the West in the 1970s might be seen as helping to shape a more benign political environment, etc. Another facet of the political-strategic argument is outlined in the final subsection.

The allocation of Soviet economic gains from trade to the military sector takes us into the question of the share of aggregate output growth channeled to defense. This issue has been treated at length elsewhere and lies outside the boundaries of a discussion of trade. In any case, the preceding discussion suggests that the burden of Soviet defense (or more broadly, of empire), was not much eased by gains from trade. The Soviet military budget is now shrinking and some proportion of military industrial capacity is being converted to civilian uses.

**SPECIFIC CATEGORIES OF TRADE**

**Technology Transfer**

The salient issue here is the role of technology transfer from the West in strengthening Soviet military potential. As the ecologists might say, whole forests have been sacrificed in the decades-long debates on this topic. The relevant conclusions seem to be as follows:

1. The Soviet Union has made a considerable covert effort over a long period to obtain militarily significant technology, embodied and disembodied, from the West. Such activities, of course, fall outside commercial trade channels. The Soviets appear to have regarded this effort as worthwhile in the past and there are reasons to believe it is likely to continue, perhaps even intensify. The Soviet press reflects fears of a growing Western technological lead; Soviet military leaders may genuinely believe that the East-West military balance is shifting rapidly to their disadvantage; the Soviet military industrial sector is suffering stresses of the “conversion” campaign, including cuts in military R&D; and the KGB is emphasizing its foreign role as it deactivates much of its former domestic counter-dissident capabilities and attempts to rehabilitate its public image.

2. Soviet commercial trade in arms consists overwhelmingly of exports. Imports, almost entirely from Eastern Europe, have been militarily noteworthy.

3. The great debates in the West have raged on the importance of Western exports of dual-use technology (goods, services, and know-how applicable to both civil and military uses). There are numerous anecdotes about Soviet military benefits from such trade but no reliable, generally accepted quantitative estimates. Absorption and diffusion in the civilian
economy were undoubtedly prolonged, uncertain, and inefficient. The speed and ease with which the Soviet military industrial sector absorbed Western technology were probably greater than in the civilian sector, but the differences may have been overstressed. Glasnost has permitted glimpses into Soviet military industrial practice that reveal problems similar to those on the civilian side.

This is likely to be increasingly more true. Gorbachev claims to have eliminated “our internal COCOM—all the obstacles and barriers that existed between the defense and civilian sectors of our economy” (speech in Cologne, FRG, June 13, 1989). One may be skeptical of the validity of this claim, but a process of this kind is evidently under way. However, it seems likely to retard rather than benefit military modernization. In the West civilian technical progress spilled over into and nourished military production, but in the USSR the military sector neither benefited from nor contributed to the technological advance of the civilian sector in substantial degree. Military production was losing some of its distinctiveness even before Gorbachev’s arrival but this has been accelerated in the last few years. Pending the radical reform that has remained in the offing but far from realization, the military sector is now threatened by civilian-style “contamination.” Thereby the process of absorption of imported Western technology in military industry may be dragged out and attenuated.

Technology transfer from the West could have been expected to play a much larger role in recent years, considering the expectations resting on Gorbachev’s industrial modernization plans. These were the centerpiece of his 1985–86 program to accelerate Soviet growth and bring the Soviet Union into the 21st century as a great power. Modernization was to be achieved by sharp growth in investment in machine building, particularly in high-technology—instruments, robotics, electronics, computers—and by rapid replacement of obsolete capital. The high-tech objectives of investment priority also happened to be of considerable interest to military planners concerned about the “revolution” in conventional military weaponry, and the increasingly sophisticated industrial technology required to produce such weapons. This probably disposed the high command favorably to Gorbachev’s early economic program. Technology transfer from the West might have been expected to accelerate the modernization effort and benefit the military as well.

Gorbachev’s plans for modernization of Soviet industry did raise expectations in the West of an accompanying Soviet trade “offensive.” However, Soviet imports of machinery and equipment from the West more or less stagnated during the first four years of Gorbachev’s stewardship. The 1988 value (roughly $10 billion) was 7 percent higher than in 1985 but 12 percent below the 1983 peak level. Allowing for price increases, the real volume of these
imports in 1988 was probably smaller than in 1985. The 1988 value jumped 20 percent over the 1987 mark, but in that year Moscow had cut purchases by 17 percent compared to 1986, in reaction to balance of payments' difficulties. In 1988 only 23 percent of Soviet imports of machinery came from the West, compared with 30 percent in 1983.\footnote{Such structural comparisons are distorted by the differences in prices governing purchases from the market, on the one hand, versus the regulated price arrangements with CMEA, on the other.} We are also told that imports of M&E from all sources "virtually" did not increase in 1989 (TASS, January 29, 1990).

Unfortunately for Gorbachev and the Soviet military, the return on the augmented investment in machine building has been disappointing. The major reason is probably the illusion that modernization could be propelled independently of fundamental system reform, but this is another subject outside the mandate of this paper. We should note here only that the delay of radical reform has prevented the restructuring of Soviet foreign trade and therefore, in turn, has hindered modernization still further.

Three factors probably explain most of Moscow's reluctance to expand imports of machinery from the West.

1. To judge from the Soviet press, much of the machinery imports of the 1970s and early 1980s was improperly planned, maintained, and used. Gorbachev is on record in criticism of such waste, as well as of the excessive importation of machinery and equipment that could have been produced at home (e.g., Pravda, May 14, 1987).

2. This raises a second objection, the alleged stifling effect on Soviet domestic R&D of dependence on technology transfer, and Gorbachev has appeared sympathetic to this argument.

3. Gorbachev has been reluctant to borrow heavily abroad to cope with deteriorating trade balances. The debate on this issue centered around suggestions to import consumer goods but it also applied to machinery purchases abroad. The dollar value of Soviet foreign debt did jump sharply under Gorbachev, but until 1989 much or most of that increase was apparently an exchange effect, the result of the weakening of the dollar. In arguing against heavy new indebtedness, the example of Poland in the early 1980s has been held up frequently. (Moscow has also husbanded Soviet exchange and gold reserves, which have not been expended at an unusual rate in the last few years.) Soviet debt seems to have grown substantially in 1989, and Soviet creditworthiness, for the first time, is slipping under the impact of payment indiscipline and Western concerns about the course of domestic development. Further extensive borrowing seems, therefore, even less likely now.
For all these reasons, Soviet leaders have found ordinary commercial trade exchange wanting as a vehicle of technology transfer. As Ivan Ivanov, deputy director of the State Foreign Economic Commission, put it, such "indirect contacts" are "economically inadequate: trade is simply unsuitable when it comes to mastering the higher forms of international division of labor and the efficient exchange of the scientific and technical revolution." The vehicle for "a much more efficient access to scientific and technical novelties" is joint ventures. Of the 320 projects developed by Soviet planners in 1988 to entice joint ventures, 114 involved science-intensive production (Kommunist, No. 12, 1988; trans. JPRS UKO 88–018, December 28, 1988, pp. 23, 25). To be sure, Soviet science and technology was to be part of the package, but the hope of intensifying, accelerating, and improving the technology transfer process is evident.

This hope too has proved hollow, at least so far. The number of joint ventures has grown rapidly in the three years since their legitimation; the total sextupled in 1989. But the number of operating ventures is far smaller. Of the roughly 1300 formally registered ventures, only about a hundred are actually functioning. More important, the average size of the ventures established is disappointingly small. The reasons for this disappointing outcome need not detain us here—profit repatriation with inconvertibility is one of the cardinal difficulties. Notwithstanding the occasional plum, such as the planned U.S.-Soviet project to build a supersonic executive transport (Gulfstream and Sukhoi), the fact is that joint ventures are not likely to accelerate technology transfer from the west in the near future. Gorbachev has used his occasional foreign expeditions to push the case for greater Western involvement. He urged the West Germans to participate in converting Soviet military industry to civilian production;² he even suggested that FRG firms and institutions commission studies by Soviet research institutes, supplying the Soviet institutes with up-to-date scientific equipment! The new hope is for "special economic zones." For some time there have been reports that such zones would be established at either end of the country, at Nakhodka and between Leningrad and the Finnish border. It remains to be seen how soon these plans will materialize.

The USSR has also hoped for technology transfer through CMEA, through cooperation with East European countries, but perhaps also by using them as a conduit from the West. There has undoubtedly been some Western export control leakage through Eastern Europe, although, again, there are no reliable estimates. But technological transfer via cooperation

²²There is already cooperation in the defense sector, cooperation that you perhaps didn’t even suspect. So now that it is becoming open, why not develop this cooperation and use the opportunities that are there"? (Speech in Cologne, June 13, 1989: Ekonomicheskaya gazeta, No. 25, June 1989).
agreements has been disappointing. Now CMEA is likely to undergo a radical transformation as the new East Central Europe attempts to develop Western-oriented market economies. Soviet trade relations with Eastern Europe will be substantially reshaped.

Moscow continues to chafe at the Western export controls on tech transfer, although these have been eased in the last few years. The likelihood is that the controls will be relaxed still further, assuming there is no marked deterioration in East-West relations or in Soviet internal liberalization. East-West cooperation in space exploration may be a significant channel of hi-tech transfer. If Soviet domestic political and economic reform proceed as promised, the Western commercial and political pressures to eviscerate the controls are likely to become irresistible. This will surely benefit Soviet military modernization; the magnitude of the gains, up or down, will be affected by the course of domestic economic reform and the increasing convergence of military and civilian industry with respect to organization, style, and operating rules.

**Soviet Arms Transfers**

The size, quality, and growth of Soviet military industry are determined very largely by the requirements of Soviet armed forces and internal influences. But the role of Soviet arms transfers abroad is a non-negligible factor. In search of global power, as well as hard currency earnings, the Soviet Union has sold or granted a huge volume of military equipment and services to foreigners. This has helped sustain a vast military industrial structure. Indeed, special military production lines were kept open just for exports. The demand side of this long-standing operation is now weakening rapidly. The transformation of Eastern Europe will surely mean a radical shrinkage of its armed forces and, more than likely, a more than proportional decline in imports of Soviet equipment. Economic stringency in the USSR translates in part into demands for cuts in economic and military aid to communist allies (Cuba, particularly) as well as to other developing countries. Hard currency payment capabilities of Soviet clients in the Third World are also limited. Possibly as a result of these factors, Soviet arms transfers to the Third World, whether on a grant or commercial basis, were cut from $19.2 billion in 1987 to $16.5 billion in 1989.

There have been articles in the Soviet press urging expansion of arms sales, on the grounds of balance of payments' needs and comparative advantage. However, so far these seem to be minority expressions. The opposition to such a course cites not only ethical or political considerations (moral compunctions about or political fears of exacerbating regional
arms races) but also the likely damage to East-West relations from such a policy and the far greater values at stake in the East-West arena.

IS TRADE A SECURITY LIABILITY?

Technology transfer has always appeared to be a one-way street. True, the Soviets have sold small amounts of machinery and equipment to hard currency purchasers. Particular Soviet innovations have often found a market in the West before application in the USSR: one of the outstanding and, to the Soviets, especially irksome examples is continuous casting of steel. But the flow has always been and remains even now predominantly West to East. Therefore, too, the security concerns on the subject of technology transfer have been predominantly those of the West. Now suddenly, the Soviet press headlines “scandals” of attempted exports of strategic goods.

The most dramatic case concerned the attempted export of T-72 tanks but an equally flagrant violation involved 17 MiG fighters, of which 11 were MiG-23s that had not even been retired from service (Sovetskaia Rossija, March 13, 1990, p. 1). Other exposés featured titanium parts; (Prawitel'stvenni vestnik, No. 6, February 1990, p. 4); locomotives (Izvestiia, February 4, 1990, p. 5); scarce scrap, front and rear axles of freight cars, crawler tank belts being sent to England by military units; and 50,000 tons of aluminum (Rabochaia tribuna, February 25, 1990, p. 2).

There may be murky political battles in these exposés (the T-72 scandal even touched Chairman of the USSR Council of Ministers Ryzhkov) but some “objective” factors may also be at work. The Minister of the Defense Industry who was implicated in the tank scandal complained that conversion and the imperative for self-financing made military industrial officials uncertain of their rights and responsibilities (TASS, February 6, 1990). These developments undoubtedly also pressure defense enterprise managers to hunt intensively for customers for their surplus production above the now diminished state orders from the Ministry of Defense. A defense industry official complained that

Weapons are moving about the country like commodities. And I fear that conversion in the form in which it is now occurring—with poor control, minimal expenditures, and the search for advantages first and foremost—can aggravate the situation. (Komsomolskaia pravda, February 1, 1990; trans. FBIS-SOV-90-027, 8 February 1990, p. 102).

Another contributing factor is surely the foreign trade reform, which by decentralizing export-import decisionmaking has undoubtedly weakened the controls on exports of strategic goods.
Some of this disarray will be eliminated by tightening controls, for example through the licensing system. But success will be bought at the cost of losing the flexibility and the decentralized initiative that the reforms have tried to bring about. The balance between these contradictory movements will depend largely on the fate of economic reform generally.

**POLITICAL FACTORS**

Finally, we should note some political connections between trade and security. Chief among these is the apparent political significance of East-West trade to Gorbachev. In 1985 he told the annual meeting of the American-Soviet Trade and Economic Council that Moscow viewed U.S.-Soviet economic relations

above all from the standpoint of politics. This is because first of all, the main question of our relations—the question of war and peace—is decided in the field of politics. All other aspects of our relations, including trade and economic ties, are called upon to serve this concern. Secondly, it is because our countries are two economic giants, fully capable of living and developing without any trade with each other. I see no economic tragedy in this. You will survive without us, and we without you—all the more so because there are plenty of other trade partners in the world today. But is this politically normal? I answer emphatically: No and again no! In this dangerous world we simply cannot, we have no right to, ignore such a stabilizer of relations as trade and economics, scientific and technical ties. If we want really solid and stable relations of ensuring a reliable peace, their foundations must include developed business relations. (*Pravda*, December 11, 1985).

Less explicitly and with greater emphasis on the economic benefits of trade, Gorbachev often repeated the basic theme: East-West trade was important in easing tensions and reinforcing peace prospects. In promoting this line, Gorbachev seemed to be using one more instrument to achieve the highest priority of his foreign policy: to constrain and reduce the external threat to Soviet national security, in order to permit single-minded concentration on the tasks of domestic restructuring. Of course, the rhetoric was also directed at the West's political barriers to expanded East-West trade, the removal of which would enlarge Soviet hard currency export markets and increase the flow of technology imports from the West. Both these goals seemed to underlie the concept of “international economic security” that was prominent in Soviet foreign policy writings in 1986–1987.

To a considerable extent, Gorbachev succeeded in his effort to reduce the Western military threat, although at the cost of unexpected concessions in arms control negotiations, unilateral reductions in Soviet military forces and outlays, as well as, most important, readiness to allow Soviet hegemony in Eastern Europe to collapse. It can be safely said that the role of trade in transforming East-West relations was minimal. In this case at least, Lenin was right and Khrushchev was wrong: politics was superior to economics.
11. MONETARY REFORM

Gregory Grossman

Money, with all its colorlessness and indifference, becomes the common denominator of all values: irreparably it hollows out the core of things, their individuality, their specific value, and their incomparability.

Georg Simmel, “The Metropolis and Mental Life” 1902
here quoted from Wolff: 1950, 144.

Money is one of those concepts which, like a teaspoon or an umbrella, but unlike an earthquake or a buttercup, are definable primarily by the use or purpose which they serve.


INTRODUCTION

Money is the same to all in daily life but diverse to many of us in our minds. Simmel’s fear of the dehumanizing effects of a contemporary urban, money economy related to his conviction that “the deepest problems of modern life derive from the claim of the individual to preserve the autonomy and individuality of his existence in the face of overwhelming social forces” within the “metropolis.” As such, his particular sociologist’s conception of money is diametrically opposed to the pragmatic and functional metaphor proffered by Hawtrey, a monetary economist and British Treasury official of about the same generation as Simmel, the author of Die Philosophie des Geldes (1900).

Today, nearly a century later, a century of globe-shaking social experiments, his critique of a modern money economy, however suggestive it may be on its own ground, evokes a powerful additional—and different—lesson to the student of contemporary Soviet monetary problems. Namely, owing in good part to money’s very “colorlessness and indifference,” the modern, highly monetized market economy contrasts favorably on both economic and broadly social scores with the oppressive, all-but-moneyless, highly personal “command-administrative”—and, yes, “irreparably hollowed out”—order epitomized by the traditional Soviet-type society.

Nor, it seems, can the Soviet society be successfully renewed, democratized, and imbued with “color,” or can things regain their “individuality” and “incomparability,” until the economy is adequately monetized. Fortunately, by dint of the growing realization that a deep monetary dysfunction, the legacy of decades of misspecification and mismanagement,
underlies much of the country's pressing ills and perils, a pragmatic approach to monetary economics has begun to take hold in Soviet economic and political circles. It still has some distance to go.\footnote{For a longer look back into doctrinal history, \textcite{Block1926} analyzes Marx's theory of money in relation to Marx's own economic theories and the theories of others (including Simmel).}

This paper addresses the current pathological situation in regard to money and related matters, the dynamics of this pathology, and some of its economic and socio-political implications and consequences. It then proceeds to assess certain therapeutic proposals. For lack of space, relatively little attention is given to the international sides of these matters.

We are acutely aware of the rush of events in the Soviet Union, and of the almost instant obsolescence of some of the facts and propositions herein detailed.

**THE GRAND ISSUES**

For the indefinite future, the over-all Soviet economic agenda will be dominated by four tightly interrelated grand issues:

- Macro-economic stabilization (with its micro-economic correlatives) in the near term, to help allay the threat of an economic catastrophe;
- Institutional and systemic transformation aiming at a new economic order (together with the necessary legal and political foundations);
- What may be called "the federal issue," that is to say, a basic redefinition and redesign of the politico-economic relations between the Center and sub-national territorial units at all levels, and among the latter; and
- The gigantic and inevitably long-range task of rebuilding and re-orienting—as well as modernizing—the country's physical capital stock (including the determined dismantling of what might be called the "negative" physical capital, i.e., the enormous and still growing accumulation of environmental degradation and of other "bads").

Obviously, these four grand issues do not exhaust the full agenda of the Soviet economy at this crucial point of its history. But in their intricate interlacing they go far to knot together, in a virtually Gordian manner, the difficult legacy of the past, the perils of the near term, and the keen anxieties for the future. They also go far in defining much of the present-day arena of ideological animosities and political battles. To the economist, the four issues are daunting in their interrelatedness and the consequent difficulties of selecting and sequencing policy measures.

A few more words about the issues individually:
Stabilization

Second to none of the other issues in urgency, stabilization has emerged as virtually a synonym for avoiding an imminent catastrophe. As such, it calls for a set of adequate, fast-acting measures to cure the grave macro-economic imbalance with the aim of halting the steady downward slide in economic performance. As usual, the macro-economic imbalance in this case is, in large measure, a monetary problem.

If the stabilization is properly performed (of which the probability is perhaps none too high, even if it is at all “in the cards”), it should help promote—but will not guarantee—stabilization and improvement in other respects, such as individual morale, social peace, and enhancement of political authority and of the country’s governability. (But what will be the country by that time?)

It would be a mistake to expect, however, that the instruments that will serve stabilization will also promote progress toward economic reform. Though it be a counsel of perfection, the principle that the number of instruments should ideally be the same as the number of policy objectives holds here as well. One major problem is time: stabilization measures have to be taken much more urgently; they cannot wait for the careful preparation of institutions that a properly executed reform necessitates, even if it be carried out in a relatively brief time period.

Institutional and Systemic Transformation

The economic (and political/legal) reform, or perestroika proper, refers to the replacement of the traditional Soviet command system of economic governance with a radically different, more flexible, more liberal one. As of early 1990, the target system has been designated as a “regulated market economy,” The phrase’s meaning is yet to emerge; e.g., the mix of property arrangements (socialist vs. private, and in which forms and proportions) still remains very much at issue. Caught on cross-currents of political strife, center-periphery battles, ethnic and territorial conflicts and skirmishes, and, not the least, the need for urgent stabilization measures, systemic reform can be expected to continue to drift and roll for some time.

The Federal Issue

As acute as any at this writing, the federal issue links up intimately with those of stabilization and reform. For instance, in the absence of macro-balance and reasonably meaningful structure of micro-economic magnitudes, preferably linked to that of the outside world, it may be nearly impossible (short of use of force) to arrive at mutually acceptable settlements of reciprocal economic claims; or for that matter, to work out a new and
reasonably viable *modus operandi* for future economic relations. Economic equilibrium, rough as it may be, is not only the end but also a powerful means of conflict resolution. At the same time, a felicitous settlement of the federal issue could leave some politically welcome leeway in the area of system transformation for every territorial unit.

**Capital-stock Rebuilding**

This is at once a direct object of institutional reform, and a major goal of the entire historical process of the economic quantum leap toward a modern, effective economy. It relates to the whole complex of the economy's productive capital: the productive physical stock, the physical working capital, external assets and resources, environment and the stock of natural resources, the fund of technological information, organizational set-ups, and, of course, human capital. On all these scores, the Soviet Union faces enormous tasks of scrapping and salvaging, repairing and restoring, clearing and cleansing, building and rebuilding, modernizing in substance and in composition; and in a world of accelerating economic, technological, demographic, and ecological change at that. Not until capacity rebuilding has made decisive progress, that is to say, not for some decades, can perestroika be said to have succeeded.

Indeed, the rapid further deterioration of the environment and of the already badly depreciated and outdated productive capacity contributes to the widespread sense of impending economic catastrophe, intensified by the common fear of major "technogenic" disasters owing to mishandling of modern technological aggregates. This obsolescence and deterioration of the physical capital stock is also responsible for the seemingly perverse sequence of Gorbachev's broad economic campaigns: starting in 1985 with "acceleration" of capacity rebuilding, which relied heavily on traditional (Stalinist) techniques; hence, seriously impeding major institutional reform as well as contributing to the decline of the consumer's welfare to boot.

In late 1986 attention and policy shifted to measures of institutional reform (in the context of what had been already characterized as a "pre-crisis" situation). Only in October 1988 was the large budget deficit publicly revealed (though long suspected to exist by Western scholars). Only in mid-1989 did the top leadership become fully alarmed by the gravity of a looming crisis of macro-economic disequilibrium ("money-commodity imbalance"), and of the consequent imperative need for an immediate and coherent stabilization program, beyond the recurrent (and generally counter-productive) attempts at broadening and tightening wage-price control.
EXCESSES, OVERHANGS, AND REPRESSIONS

As noted, this paper addresses those aspects of the issue of economic stabilization in the USSR that relate to the presence of a serious, and seemingly worsening, macro-economic situation. More precisely, the macro-imbalance is in large measure that of excess aggregate demand in relation to aggregate supply at the official (controlled) price level. In turn, the excess demand (a flow) relates to the monetary overhang (a stock), which is that portion of the total money supply on hand and in tills, at the given moment in time, that is in excess of the amount of money that economic agents would be willing to hold voluntarily ("demand for money") under specified conditions. These conditions include the already-mentioned aggregate supply of goods at official prices, the stock of financial and real assets, the rate of interest, administrative and legal conditions and constraints, the over-all state of expectations, and other parameters well known to economists.2

A condition of the sort just sketched is generally termed to be one of "repressed inflation." What is "repressed" are prices, which are legally and administratively kept from rising to that higher average level at which aggregate supply expressed in these prices would equal aggregate demand. Should such "de-repression" take place for whatever reason, both the monetary overhang and the excess demand would disappear, by definition, and we would no longer be justified to speak of macro-imbalance.

Of course, the disappearance of macro-imbalance might not be a simple matter of a sufficient price rise. Rather, in a modern market economy, the process would also include simultaneous and endogenous adjustments in interest and exchange rates, portfolios, employment, and production, etc. The traditional Soviet-type economy, however, and even the Soviet economy of 1990, is mostly innocent of such niceties, at least in the price-controlled part of the economy.3

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2By using terms such as macro-imbalance we do not mean to take a position in the lively debate between proponents of "disequilibrium" and "shortage" approaches. The issue falls outside the scope of this essay. Suffice it to note that both sides in the debate would hardly dispute the existence of macro-imbalance and of goods shortages in the price-controlled sector of the USSR in recent years. They would probably also both agree that retention of the traditional Soviet-type economic system would do little to cure the problems under present conditions. For incisive treatments of the debate see the works by Davis; Davis and Charemza, Kornai; and Portes.

3Paradoxically, Soviet producers and sellers sometimes favor below-equilibrium fixed prices for the goods they sell in the first economy, in order to increase the side-payments, bribes, favors, and bartered goods to be collected from buyers. It may be also noted that black-market prices for particular goods are not always higher than the official ones. They can be lower if (a) the goods enter black-market channels at very low cost (through theft or tax evasion); and (b) the supply in the black market is large enough relative to demand. A classic Soviet example is the price of bootleg gasoline, which has generally been far lower than the official price, owing to massive stealing by truck drivers from the state.
In point of fact, truly universal and fully effective price control has never existed in the USSR, and is even less the rule today. A wide range and large volume of transactions take place at uncontrolled prices, in part lawfully (e.g., at so-called kolkhoz markets or in the innumerable personal transactions between individuals), and in part illegally, in black markets or in terms of hidden inflation in the first economy. Many transactions, particularly in the first economy and especially today, take place with no monetary mediation, by barter, and the ratios of exchange in natura may or may not express the corresponding official prices.

At the same time, the sphere of transactions at de facto and even de jure free prices has increased considerably in recent years. The second economy seems to have expanded mightily during the Gorbachev years, in part thanks to the monetary developments and their repercussions, such as spreading shortages of both consumer and producer goods. Black-market activity and corruption have clearly grown in value and probably also in volume during the perestroika era. So has the range of sales at lawful uncontrolled prices thanks to the new cooperatives, some widening of the scope of legal "individual labor activity," and such recent innovations as formal auctions of various kinds (for producer goods, consumer goods, foreign exchange). Finally, the considerable simultaneous growth of corruption by all indications must have increased the relative importance of "prices" in this non-price-controlled sphere of the economy: bribes, under-the-counter payments, protection payments, and the like. As they say in the Soviet Union: There are no shortages; you can buy anything, for a price!

The theoretical significance of these observations is that the concepts of "repressed inflation," "monetary overhang," and "excess demand" may require qualification in an economy where, along with widespread price control, transactions at uncontrolled prices are both ubiquitous and substantial. These concepts still apply to the price-controlled sector of the economy (the first economy) if it is seen by itself. In fact, they may so apply even with stronger force, insofar as the volume of resources and supplies in the first economy is diminished by diversion to the second economy, while prices are generally lower in the former than in the latter, so that the pressure of demand on supply in the first economy may in fact increase directly with relative size of the second. In turn, the consequent intensification of shortages in the first economy may stimulate further rise of prices and growth of volume in the second economy. Concurrent monetary developments may accelerate this process. The spiral unwinds.

To sum up: in a traditional, price-controlled economy of the Soviet-type, but with widespread price-uncontrolled transactions (second economy), the concepts of "repressed
inflation,” “monetary overhang,” and “excess demand” apply to the price-controlled (first) sector of the economy alone and not to the total economy (first plus second).\(^4\) Hereinafter, such terms as “excess demand,” “repressed inflation,” “monetary overhang,” “macro-disequilibrium,” etc., will relate to the price-controlled economy only, unless otherwise stated.

Naturally, to make this point is not to dismiss all macro-economic problems; they remain serious enough for the authorities concerned with “their” economy. Moreover, if a balance between aggregate demand and supply can be said to exist for the total economy, it is still of a highly deformed kind, with widespread price distortion, multiple controlled as well as uncontrolled prices for nearly every good, redistribution of income and wealth and reallocation of resources, not to speak of corruption and criminalization.\(^5\)

**The Demand for Money**

With reference to the household sector (the “population” in Soviet parlance), the money in question is either currency or savings deposits, at least that part of the latter that is withdrawable on demand (some 60 percent lately) paying interest at 2 percent [see Table 11.1]. Checking accounts, charge accounts, and credit cards are still practically non-existent. Holdings of government bonds and cash-value of insurance policies are neither liquid enough nor large enough to count for the present purpose.

In addition to normal individual balances held between paydays (and many seem to live from payday to payday, the macro picture notwithstanding), much of the money held by households is probably in fact long-term, purposive savings for expensive items. But also in the picture are: (1) the demand for money (particularly currency) for transaction purposes in the underground economy, especially significant for large underground operators; (2) the “may be” motive that anticipates random acquisition of hard-to-get expensive items, and (3) the risk-ensuring motive for holding money in order to buy one’s way out of difficulties and around obstacles. As for the last, it must be remembered that a large monetary bribe is the normal way of overcoming obstacles and bypassing difficulties, and in the final analysis this

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\(^4\)To our knowledge, this point was first brought out in Grossman (1977). For similar positions see Hartwig (1983, p. 104) and Nuti (1986, p. 64).

\(^5\)Perhaps the most striking case of multiple pricing is the introduction, in 1987, of over three thousand individual correction coefficients to the official exchange rate for exports and imports. They were to be replaced by a single, devalued (halved) exchange rate as of 1-1-1990, and yet a new single exchange rate in 1991, but these steps have now been deferred pending a general price reform. (Pedarov in Kommunist, 1990).
Table 11.1

(in billions of rubles at end of year)

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<td>126.2</td>
<td>521.3</td>
<td>432.1</td>
<td>464.6</td>
<td>391.1</td>
</tr>
<tr>
<td>2. Short-term</td>
<td>(104.7)</td>
<td>(426.4)</td>
<td>(356.6)</td>
<td>(302.3)</td>
<td>287.2</td>
</tr>
<tr>
<td>3. Long-term</td>
<td>(21.5)</td>
<td>(94.9)</td>
<td>(96.0)</td>
<td>(102.3)</td>
<td>104.0</td>
</tr>
<tr>
<td>4. Gosbank and Savings Bank, loans to the budget (Treasury)</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>[280-290]</td>
<td>370-380</td>
</tr>
<tr>
<td>5. Total, above-listed bank loans^b</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>[680-700]</td>
<td>750-770</td>
</tr>
<tr>
<td>6. Deposits in Savings Bank [SD]</td>
<td>46.6</td>
<td>220.8</td>
<td>266.9</td>
<td>296.7</td>
<td>337.7</td>
</tr>
<tr>
<td>7. Ditto, withdrawable on demand</td>
<td>n.a.</td>
<td>n.a.</td>
<td>159.2</td>
<td>176.2</td>
<td>201.6</td>
</tr>
<tr>
<td>8. Currency in circulation [C]</td>
<td>@24</td>
<td>[@75]</td>
<td>81.0</td>
<td>92.8</td>
<td>110</td>
</tr>
<tr>
<td>9. Ditto, in possession of population [C]</td>
<td>n.a.</td>
<td>n.a.</td>
<td>876</td>
<td>88</td>
<td>105.1</td>
</tr>
<tr>
<td>10. &quot;Monetary means&quot; of enterprises (incl. kolkhozy)</td>
<td>n.a.</td>
<td>[@[58]</td>
<td>93.9</td>
<td>111.0</td>
<td>114.4</td>
</tr>
<tr>
<td>11. Ditto, excl. kolkhozy</td>
<td>14.5</td>
<td>51.3</td>
<td>81.5</td>
<td>98.2</td>
<td>n.a.</td>
</tr>
<tr>
<td>12. Sum of lines 7 and 9</td>
<td>n.a.</td>
<td>n.a.</td>
<td>235</td>
<td>264</td>
<td>306</td>
</tr>
<tr>
<td>13. Sum of lines 10 and 12</td>
<td>n.a.</td>
<td>n.a.</td>
<td>329</td>
<td>375</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

NOTES: n.a. means not available; [] means our estimate; BR means billions of rubles.

^a. Long-term loans include very small amounts of loans to households (0.6 BR in 1970, 5.8 BR in 1988).

^b. There may be other domestic loans for which no data are published; e.g., to "social organizations."

may be the most important reason to hold ready money for those who already have illicit wealth and are at risk therefrom.

Regarding the distribution of money holding between currency and savings deposits, two considerations may be mentioned: (1) Keeping substantial amounts of money in the savings bank is generally much more secure than keeping currency at home, given the usually cramped quarters and (especially lately) the high rate of burglary. But only to a point. (2) Large savings accounts can attract attention and raise suspicion of criminality (not always without cause). It is much better to hold it in jewelry and the like, especially because nonfinancial valuables have been rapidly appreciating in the black-market in recent years. Could there be a kind of voluntary ceiling on savings deposits?

We find some support of this hypothesis when we examine average sizes of individual passbook accounts by republics. At the end of 1988, the highest such figure (Lithuania - 2,352 r.) is just under double the lowest (Azerbaijan - 1,196 r.). (Official data, Narkhoz, 1988, p. 96.) Everything considered, the difference appears moderate. Of course, a family can have several accounts, sometimes under proxy names.

THE MONEY SUPPLY

It is time to turn to the numbers. Glasnost has not yet reached the point of official publication of the absolute amounts of any but a few of the relevant monetary, financial, and fiscal magnitudes. Nor can we always be sure of the accuracy of the published figures; or even their precise definitions. The financial data of the last few years reflect the recent acceleration of price inflation, itself a statistically shadowy magnitude.

Table 11.1 summarizes some relevant data in absolute terms from 1970 to 1989, insofar as they are available or can be fairly estimated. The table opens with a puzzle: The precipitous decline in the aggregate value of short-term loans outstanding to the enterprise sector between the end of 1985 and the end of 1989: by 141.8 billion rubles, or by 33.3 percent, and by about 5 to 6 percent of the average annual national material product (NMP) for the four years. Not only is this a very large change, but its direction is at sharp odds with virtually every other financial magnitude during those inflationary years.

In fact, almost one-half of this drop occurred in the first year, 1986—69.8 billion rubles, over one-tenth of NMP for that year. We know from the published data that practically the whole drop in 1986 and some three-fourths of it through 1988 are accounted for by the construction industry, and that 54 billion rubles of inventory and other physical

---

6Cf. Bondarenko in Pravda, 21 March 1990, who points to burglary protection as reason against raising the very low interest on savings deposits.
assets were taken off the books of contract construction in 1986. What we do not know is the financial and accounting repercussions of such very large balance-sheet changes. Much of inventory carried in 1986 on the industry's books was so-called non-completed construction, and much of that was of dubious worth indeed. Since the early eighties inventories were mostly financed by bank credit (as discussed at length in Grossman; 1986a); hence, one suspects a direct connection between the drop in short-term loans outstanding and the removal of most noncompleted construction from the industry's books. Incidentally, the value of noncompleted construction (both contract and noncontract) has been growing rapidly in the same period: from 126 billion rubles in 1985 to 203 billion in 1989.

For our purpose, the important question is whether and to what extent the huge reduction in short-term loans outstanding, the 141.8 billion rubles, represents: (1) a true net repayment of loans by enterprises, that correspondingly diminishes the money supply and partly offsets the simultaneous and even greater borrowing by the budget from the State Bank. This explanation finds little support in relevant published data.\(^7\) (2) If, or to the extent that, the reduction in loans is not due to repayments by enterprises, then, whatever the accounting, this loan reduction is not contractionary. Hence, it does not offset the expansionary effect of the budget's borrowing from the State Bank.\(^8\) And indeed, we see that in Table 11.2, during the three years 1986 to 1988, the combined increment in bank loans to the budget, the enterprise sector, and the population (line 16), less an estimated 6 billion rubles of loans from Gosstrakh (State Insurance), rises about 70 to 75 billion rubles, while the increase in money supply, as defined on line 22, rises some 160-165 billion rubles, or by some 85 to 95 billion rubles more. Compare this with the (ostensible) drop in short-term loans outstanding over the same three years in the total amount of 124 billion rubles. Could it be that some 30 to 40 billion rubles of the decline in short-term loans is accounted for by a write-off of bad debts? Or by a shift in accounting practice?

No absolute figure for total currency (nalichnye) in circulation has been officially published for over 50 years. The figure of 105.1 billion rubles (Table 11.1, line 9) has been officially stated for restricted circulation in Itogi (1990, p. 4). We tentatively accept an estimate of about 110 billion rubles for total currency in circulation at (presumably) the end of 1989 (Titarev, 1990). (It checks reasonably well with 105.1 billion rubles for household

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\(^7\)During the same four years, long-term bank loans to enterprises and the population increased by 8.4 billion (Table 11.1, line 8), thus slightly offsetting the decrease in short-term loans.

\(^8\)Writing off (forgiving) loans has taken place on a large scale in the Soviet Union, especially in agriculture. Between 1975 and 1990, 26.7 billion rubles of loans to kolhozes and sovkhozes were written off, while 145.5 billion rubles were rescheduled (Bekker 1990).
### Table 11.2
Selected Data on Financial Flows (or year's changes in stocks), 1985-90 (in billions of rubles)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Budget (consolidated)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Expenditures</td>
<td>-386.5</td>
<td>-417.1</td>
<td>-430.9</td>
<td>-459.5</td>
<td>n.a.</td>
</tr>
<tr>
<td>2. Revenues (excl. all borrowing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Expenditures less revenues</td>
<td>371.2</td>
<td>369.7</td>
<td>376.5</td>
<td>376.9</td>
<td>n.a.</td>
</tr>
<tr>
<td>4. Financed by: Loans placed with population</td>
<td>-15.3</td>
<td>-47.4</td>
<td>-54.4</td>
<td>-82.6</td>
<td>n.a.</td>
</tr>
<tr>
<td>5. Savings Bank loans</td>
<td>1.4</td>
<td>1.9</td>
<td>1.9</td>
<td>2.0</td>
<td>2.2</td>
</tr>
<tr>
<td>6. Gosstrakh loans</td>
<td>-18.0</td>
<td>-47.9</td>
<td>-57.1</td>
<td>-2.6</td>
<td>92.1</td>
</tr>
<tr>
<td>7. Gosbank loans</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>66.5</td>
</tr>
<tr>
<td>8. Increase in budget's deposits in banks³</td>
<td>+4.1</td>
<td>+2.4</td>
<td>+.6</td>
<td>+2.5</td>
<td>n.a.</td>
</tr>
<tr>
<td>9. &quot;Deficit&quot; (≡ line 3)</td>
<td>15.3</td>
<td>47.4</td>
<td>54.4</td>
<td>82.6</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

**Banks (and Gosstrakh)³**

**Assets:**

| 10. Loans, short-term, to enterprises                  | 23.6  | -69.8 | -21.9 | -32.4 | -7.7  |
| 11. Loans, long-term, to enterprises and population    | 0.9   | 1.1   | 1.4   | 4.9   | 1.0   |
| 12. Loans to budget:                                  | 18.0  | 47.9  | 57.1  | 90.1  | 92.1  |
| 13. from Savings Bank                                  | (21.6)| (2.6) | (62.5) |       |       |
| 14. from Gosstrakh                                     |       |       |       |       |       |
| 15. from Gosbank                                      |       |       |       |       |       |
| 16. Total, known loans                                | 42.5  | -20.8 | 36.6  | 82.6  | 85.4  |

**Liabilities:**

| 17. (Savings) Certificates sold                        | --    | --    | --    | 0.9   | 1.9   |
| 18. Currency issued                                   | n.a.  | 65    | 412   | 18    |
|----------|------|------|------|------|------|
| 19. “Monetary means” of enterprises (incl. kolkhozy) | n.a. | 36   | @17.1 | n.a. |
| 20. Ditto, excl. kolkhozy | 1.1  | 30.1 | @16.7 | n.a. |
| 21. Budget account (line 8) | 4.1  | 2.4  | 4.6  | 9.5  | n.a. |
| 22. Savings deposits | 18.7 | 22.0 | 24.1 | 29.8 | 40.7 |
| 23. Ditto, withdrawable on demand | n.a. | n.a. | n.a. | (17.0) | (24.3) |
| 24. Sum of lines 18, 19, 20, 21 | n.a. | 94   | n.a. | 69.3 | n.a. |

**Enterprise sector**

**Assets:**

25. “Monetary means” (line 19) | 1.1  | 36   | 17.1 | 4.4  |

**Liabilities:**

26. Bank loans, short-term | 23.6 | -69.8| -21.9| -32.4| -7.7 |
27. Bank loans, long-term | 0.2  | 0.7  | 0.7  | 2.2  | 0.1  |

**Population (households)**

**Assets:**

28. Currency | n.a. | $8   | $11  | 17   |
29. Savings deposits | 18.7 | 22.0 | 24.1 | 29.8 | 40.7 |
30. Treasury bonds | 1.4  | 1.9  | 1.9  | 2.0  | 2.2  |
31. Certificates | 0.2  | 0.7  | 0.7  | 2.2  | 2.2  |
32. Sum of above (rounded) | n.a. | $58  | n.a. | 44   | 62   |

**Liabilities:**

33. Bank loans, long-term | 0.2  | 0.4  | 0.7  | 2.7  | 1.6  |

**NOTE:** n.a. means not applicable.

**SOURCES:** Lines 1-7: 1985-1988, from *Narkhoz*, 1988, p. 824; except the breakdown for 1988 is from *Ocheta*, p. 5, and the figures for 1989 are from *Izog*, pp. 1-4. Lines 10 and 11 are from Table 11.1 and *Narkhoz*, 1988, p. 629. Lines 12-15 are from lines 5-7 above. Line 20, 1986 is from *Vestnik statistiki*, 1986:12, p. 72. Lines 17-33 are from other parts of this table and for Table 11.1.

*Residual. Plus sign indicates an increase in the deposits, although these amounts may in some measure be expended on extra budget-items.

*Gosstrakh is the Soviet insurance monopoly.*
currency holdings.) Titarev, a senior economist at the USSR Banking Research Institute, also estimates the cumulative loans from the banking system to the Treasury at 370 to 380 billion rubles (Table 11.1, line 4).

Table 11.3 recapitulates what seems to have been the holdings of money (in billions of rubles, from Table 11.1). Data are not available for the money holdings of “social organizations” and of “budgetary organizations”—both presumably substantial.

Table 11.3
Money Holdings of Enterprises and Households
(in billions of rubles, at year-end)

<table>
<thead>
<tr>
<th>Category</th>
<th>1988</th>
<th>1989</th>
<th>Percent change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise (business) sector:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“monetary means”</td>
<td>111.0</td>
<td>114.4</td>
<td>+3.1</td>
</tr>
<tr>
<td>Households:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Savings deposits</td>
<td>296.7</td>
<td>337.7</td>
<td>+13.8</td>
</tr>
<tr>
<td>same, on demand</td>
<td>(176.2)</td>
<td>(201.6)</td>
<td>+14.4</td>
</tr>
<tr>
<td>Currency</td>
<td>88(^a)</td>
<td>105.1</td>
<td>+19.4</td>
</tr>
<tr>
<td>sub-total (rounded)</td>
<td>385(^b)</td>
<td>443</td>
<td>+15.1</td>
</tr>
<tr>
<td>or, currency plus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>demand deposits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total money supply as above</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) The increase from the end of 1987 to end of 1988 was 18.2 percent.
\(^b\) The increase from end of 1987 to end of 1988 was 12.3 percent.

In sum, the population’s money holdings (currency plus all savings deposits) increased by some 12 percent during 1988 and by 15 percent in 1989. Enterprises’ money holdings increased by some 18 percent during 1988. But in these two years, the GDP was, at best, unchanged. Total money supply, as defined above, at the end of 1988 was almost 500 billion rubles.

Was this much, little, or just right?

The Soviet economic literature is replete with numerical estimates of the excess purchasing power (“hot money”) in the public’s hands, though we have yet to encounter any convincing theoretical or empirical basis for them. In any case, whatever conceptual validity such conjectures may possess, the money in question is doubly “hot,” in that it putatively represents unwanted money holdings and in that, under present Soviet conditions, the unwanted money holdings would seem to fluctuate in response to politico-social events and to rumors as well as official pronouncements; cf. the panic buying by consumers in late May 1990.
One may begin answering the question of "much or little" by taking a longer look. In Table 11.4 we can crudely make out both the open price inflation and the build-up of the monetary overhang in the course of almost two decades, 1970 to 1989. The first three lines are proxies for real growth of the economy (though the CIA's data on GDP, shown on Lines 1 and 2, may nevertheless somewhat overstate real growth). Line 4 gives the revised Soviet official series for net material product (NMP) showing nominal growth primarily at the official, controlled prices and wages, about 1.5 to 2 percent per annum above our proxies for the real rates of growth. Lines 5 through 7 depict the long-term build-up of monetary magnitudes; these grow much faster than even the nominal—not to mention the real—output series for the whole two-decade period, but especially during 1986 through 1989. This large and widening gap between monetary growth and nominal NMP growth suggests the build-up of excess demand and of the monetary overhang. (In regard to the even faster growth of monetary magnitudes during 1988 and 1989, see Table 11.3.)

Table 11.4
Selected Series, 1971-1989
(growth in percent per year)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP, &quot;real&quot; (CIA series):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. 1970 wts</td>
<td>2.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. 1982 wts</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
</tr>
<tr>
<td>3. Freight/cargo shipped, weight</td>
<td>3.1</td>
<td>1.4</td>
<td>2.8</td>
</tr>
<tr>
<td>4. National income (NMP)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>utilized, nominal, official</td>
<td>4.7</td>
<td>3.9</td>
<td>4.5</td>
</tr>
<tr>
<td>5. Currency in circulation [C]</td>
<td>7.8</td>
<td>@10</td>
<td>@8.3</td>
</tr>
<tr>
<td>6. Savings deposits [SD]</td>
<td>10.9</td>
<td>11.2</td>
<td>11.0</td>
</tr>
</tbody>
</table>

NOTES: Lines 1 and 2 - 1970-89 figure chained at 1980. In the opinion of some specialists, the CIA series may overstate the real rate of growth. Line 3 - official data on tons shipped, incl. maritime freight; accuracy not beyond reproach. Line 4 - official series, corrected (Narkhno, 1988, p. 16). Line 5 - 1970-85 is based on Gorbachev's statement of a 3.1-fold increase in C (Pravda, 27 June 1987), 1985-89 - from Table 11.1. Lines 6 and 7 - from Table 11.1. N.B. Stock variables are as of year-end.

From end of 1985 to end of 1988 as much as 24.2 percent per year.

The chief beneficiary of the inflationary thrust of the Gorbachev years has been the enterprise sector, building up its bank balances about half again as fast as the household sector built up its currency holdings and the much-noticed savings deposits. Contrary to some opinions, the rate of growth of savings deposits during the Gorbachev years has been only marginally faster than in the preceding three quinquennia, and the very large absolute increments of savings deposits in recent years are chiefly an expression of a fairly steady
high rate of increase over decades plus the magic of geometric growth—the effect on the
economy being further aggravated by the sharp slowdown in real growth in the very last
years.

Reams of anecdotal information over the last few years fully support the impression
that the Soviet economy is indeed awash with unwanted money, in the aggregate if not in the
individual purse. One can mention the flight from the ruble; lengthening waiting lines;
empty stores; barter, especially among producers, who are increasingly resorting to in-kind
mediums of exchange, e.g., standard building materials; sharply rising black-market prices
and side-payments or bribes of all types; producer-good auction prices averaging double and
more the official ones; and finally, by official announcement, an ever-rising currency issue.

STABILIZATION: ALTERNATIVES AND PROBLEMS

It is generally, and correctly, stressed that under the conditions just described,
macro-economic stabilization has two sides: fiscal and credit restraints to stop the “printing
press,” and administering the painful but necessary treatment of eliminating the monetary
overhang. Certainly, the latter is almost pointless without the former, or the painful
treatment will be needed repeatedly. See, inter alia, the excellent works by Kornai (1990),
McKinnon (1990), and Nuti (1989b). A very instructive if not an unquestionable model is the
West German monetary reform of 1948; see Richter (1979). The Soviet budget deficit has
been fully and ably analyzed by Ofer (1989).

Neither task will be easy to accomplish, and certainly not without short-term
impairment of the desiderata of systemic reform—not to speak of the preservation of the
political cohesion and perhaps territorial integrity of the USSR. A regime of faint legitimacy
and weak authority, multiple and mutually hostile political structures and ethnic
movements, a declining economy, a wasting capital stock, diminishing hard-currency
earnings, ongoing great redistribution of personal income and wealth, regional contumacies
and rebellions, appalling economic and social conditions, an anxiety-ridden and angered
population—these are hardly the conditions for successful control of the budget and the
banks to reverse the upward trend in new money creation.

True, there are “reserves”: drastically cutting military expenditures, drastically
cutting investment—which is still large but probably in fact does little more than maintain
over-all productive capacity, if that—drastically eliminating subsidies, and borrowing abroad
to import consumer goods, both to alleviate hardships and to feed the revenue side of the
budget. Theoretically, the four together could yield large resources for both stabilization and
reform. But the first three are politically explosive, and investment reduction is also costly
with regard to the future. The import solution entails not only the danger of excessive
external indebtedness but also the question of how to face the public’s enhanced expectations
when the imports return to “normal.” Finally, nearly every substantial revenue-raising
scheme is likely to have negative incentive effects on independent business, and hence to
conflict with systemic reform. With such difficult trade-offs, stabilization assumes a priority
second only to disaster control.

The outlook for eliminating the monetary overhang is also dim. Dissolving the
monetary overhang through a major, quick price rise—as in the United States after World
War II—is politically nearly impossible. True, a slow and limited, and to some extent
officially sponsored, price increase is in progress, but its curative powers are doubtful.
Rather, it tends to bring together the worst of both open and repressed inflation.

A question of prime importance for monetary stabilization policy is the nature of the
inflation to be cured. Is it of the repressed or of the hyper-inflation variety? The two can
hardly go together (unless there is more than one currency, as during 1922-24 in the Soviet
Union). If inflation is of the repressed kind (possibly joined with a significant open inflation,
which is the current Soviet case), it is probably harder to cure than a hyper-inflation.

One reason is that in a socialist state, vested interests in the status quo are much
greater and stronger in the case of a repressed inflation than of hyper-inflation. Repression
inevitably calls for a large bureaucracy to control prices, wages, and exchange rates; to
allocate shortages; to issue production orders, and so forth—all of which constitute powerful
institutional defenders of the system. The public at large has come to terms with the system;
everyone has a big or little racket, a secure job, a certain pay packet. On the other hand,
hyper-inflations rarely create such strong institutional as well as pervasive individual vested
interests as do repressed inflationary situations.

A second reason is that the relative price structure within a country with repressed
inflation is likely to be far more divorced from the world price structure than in the case of
hyper-inflation. Much of the pain of price readjustment, as well as much of the wiping out of
personal savings, will have already taken place in a hyper-inflationary situation; not so with
repressed inflation.

Understandably, the authorities hesitate in this environment to deregulate prices
substantially. And it cannot be overemphasized that price control is the central pillar of the
command system, for it virtually guarantees the survival of nearly all of the other
institutions of economic command and control. One need hardly stress the socio-political
dangers inherent in this trend under existing Soviet conditions. At the very least, systemic
transformation or federal restructuring (in the senses these phrases are used in this chapter)
are extremely difficult in the midst of an intense and intensifying repressed-cum-open inflation.

Money reform that confiscates or at least freezes the monetary overhang is politically equally difficult. Of political importance for any money reform is the pre-reform distribution of money holdings among households. Proponents of confiscation of holdings above a certain amount, who tend to be conservative in the Soviet spectrum—the amount is generally taken to be 10,000 rubles—tend to stress the large number of persons with large fortunes in currency or savings deposits, usually presumed to have been illicitly obtained. Their opponents, lacking data on the size-distribution of currency, tend to retort that the (largely unpublished) size-distribution of savings deposits is rather even, with deposits above 10,000 rubles accounting for only a few percent of aggregate savings deposits. Also, as we have already seen, the average size of savings deposits by republics, regions, and cities tends to vary little, less than one might expect from the overall regional economic differences.

Because there are no published Soviet data on the size-distribution of currency holdings, we resort to the data of the Berkeley-Duke survey of the wealth of emigrants (as part of the Project on the Second Economy of the USSR). [We found, for the late 1970s, striking differences in mean per capita currency holdings between regions of the USSR, virtually uncorrelated with mean official per capita incomes—though, of course, highly correlated with informal incomes—generally rising sharply from north to south.] Thus, taking all of European USSR together (524 families in our sample), the mean per capita currency holding is only slightly over one-tenth of the corresponding statistic for ethnic Armenians who resided in Armenia (175 families). The respective figures are 444 and 4,030 rubles. We would not expect the intervening ten years to have moderated this striking contrast, except to heighten it. Clearly, any confiscatory or cash-freezing monetary reform would raise major problems of interregional and international equity, especially at this time. The same may be said of any measures leading to sudden, steep price increases—which are also confiscatory of the real worth of savings.

Many Soviet stabilization proposals call for selling off state assets, or issuing shares or other securities to private persons, to absorb surplus cash. Yet, to sop up excess liquidity, privatization schemes must draw on large pools of private money. Stabilization measures that depend on bringing into the open large amounts of private wealth, especially monetary assets, face the problem of revealing “dirty money.” Many of the larger, and nearly all of the largest, private accumulations almost certainly have suspect antecedents, unless these have been successfully “laundered.” Since May 1986, Soviet law is stricter in this regard than at any time after World War II. True, the 1986 measures seem to have been weakly enforced
lately, whether because of neglect or corruption—but the risk to the owner persists and will not be easily erased in the public’s mind short of very far-reaching political upheavals. There is serious question whether any assurances of nonprosecution by the authorities will be sufficiently heeded to produce the desired effect. In any event, it will take time for the limits of the possible and the prudent to be tested. Measures that preserve the purchaser’s anonymity may be more popular, but are less likely to serve the ends of stabilization or privatization. Indeed, it may well take much time to produce the desired effect by selling off the state’s assets even if all the rubles in Russia were “clean.”

More broadly, a serious obstacle to constructive economic measures is the widespread lack of trust in the government’s word. Suffice it to point to consumer runs on such things as soap. Would the Soviet public be more trustful if the government placed its “full faith and credit” on the line to sustain the convertibility of a new “hard” ruble? Of course, in some measure the answer depends on the ruble’s new par value. If, say, gold were made expensive enough in ruble terms, its reserve may outlast the gold rush—but of course at the risk of greater price inflation. (Apropos, how large is the Soviet gold reserve, anyway? Is there any basis for the round figures that periodically appear in the press? No one in the West, or East, has any reliable information, it seems.)

Much is said these days about a possible “shock therapy” (“big bang”) for the USSR, supposedly a close relative of the Balcerowicz plan launched in Poland on January 1, 1990. The contrasts between the two countries’ situations are very great and go far beyond the differences in inflation experiences. Indeed, on many scores, Poland may be the one country in Eastern Europe in which a “big bang” has a chance of destroying the virus without killing the patient. The Soviet Union may well be at the other end of the spectrum.

In sum, a successful attack on the monetary overhang, like the stopping of the printing press, will be very difficult indeed. The eventual solution may require an even more difficult set of political and even territorial mutations.
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12. SOVIET OPTIONS FOR MONETARY REFORM

Judy Shelton

ФИНАНСОВАЯ ПРОПАСТЬ—САМАЯ ГЛУБОКАЯ ИЗ ВСЕХ ПРОПАСТЕЙ, В НЕЙ МОЖНО ПАДЕТЬ ВСЮ ЖИЗНЬ.

[The financial abyss is the deepest abyss of all; you keep falling into it your whole life.]

Ilf and Petrov, The Golden Calf

Desperate is too mild a word to describe the economic situation today in the Soviet Union. Soviet citizens seem to have reached the limits of their legendary patience as mobs in the street decry Mikhail Gorbachev for his seeming resistance to radical reform. As an economic remedy, perestroika has failed.

In the wake of the startling political forces that have been unleashed in the Soviet Union, it's astonishing to remember that what Gorbachev actually set out to do was to fix the economy. The word “perestroika” encapsulated his strategy for (1) granting managerial autonomy to state-run enterprises, (2) imposing self-financing as an accounting concept, and (3) initiating price reform. In theory, perestroika offered the right medicine for treating Soviet economic and financial ills. But it did not adequately deal with the internal monetary situation and this has proved to be a fatal oversight.

The ruble is a runaway currency. Yearly revenue shortfalls in the state budget requiring chronic deficit financing have bloated the overall level of rubles in the Soviet system. The population holds some 300-400 billion rubles in savings accounts and another 100-150 billion rubles in cash. In the presence of such strong inflationary pressures, Gorbachev and his advisers have put off price reform for fear that it might result in explosive social protest.

The delay, though, has served to undermine the whole program. Without market-determined prices, how can independent managers make rational production decisions? How can they determine their financing needs or be held accountable for profits or losses? In hindsight, it's clear that Gorbachev's initial attempt to rebuild the Soviet economy without first stabilizing the ruble was doomed; you cannot construct a new house on a foundation of quicksand.

With the recent declarations coming out of the Communist Party platform endorsing individual property and the demonopolization of production, it's possible new life can be breathed into perestroika. But if Gorbachev expects his latest efforts for economic reform to have any better chance of success, he needs to get down to basics. That means repairing the
Soviet monetary system and restoring the value of the currency. The Soviet Union needs to have a solid ruble before it can introduce market pricing mechanisms and begin to make progress toward resolving its financial and economic deficiencies.

The objective here is to outline four possible approaches to Soviet monetary reform, each carrying a different set of potential risks and rewards. The options range from imposing a repressive currency revaluation that would effectively confiscate peoples' savings to adopting a ruble/gold convertibility scheme supported by a U.S. commitment to anchor the monetary value of gold.

The currency question is, of course, intimately connected with broader financial problems in the Soviet Union, such as the need to balance the state budget, restructure the banking system, improve tax collection, reduce the level of subsidies, and defuse inflation. Ultimately, the Soviet Union wants to be integrated into the global trade and financial system. But the focus here is on a much narrower issue: How to fix the money.

INTERNAL CRACKDOWN

The least imaginative approach, the one most in keeping with the "old thinking" brand of totalitarianism, would be to impose a currency revaluation without prior notice, ostensibly for the purpose of moving to a more efficient monetary system. The Soviet government would simply announce that old rubles were being replaced with new rubles. Citizens would be informed that during a limited time period, starting immediately, they could trade in their old money for the new money. After that, the old rubles would expire worthless.

This type of monetary reform was carried out in 1947. Soviet citizens who turned in cash received one new ruble for every ten old rubles and effectively lost 90 percent of the nominal value of their holdings. Those who kept their money in savings banks were less heavily penalized. The first 3,000 rubles in a savings account could be traded in at a one-to-one ratio (no loss); from 3,001 to 10,000 rubles in savings the trade-in ratio was three to two (33 percent loss), and for deposited amounts in excess of 10,000 rubles the trade-in ratio was two to one (50 percent loss).

Expropriation of the peoples' money was justified on the premise that law-abiding citizens were likely to have only modest savings; people with lots of cash or large savings balances were suspected of participating in black-market activities. It is not surprising that there were very few complainers in 1947, nor were there many in 1961, when another 10-to-1 reverse currency split was effected under Khrushchev.

These days, however, the mood in Moscow, not to mention places like Riga or Baku, could prove decidedly less passive. Citizens who are beginning to question where their
patriotic allegiances should lie would hardly find it reassuring to be the victims of a Kremlin-inspired plot to trick them out of their savings. Already, rumors of an impending currency reform have served to exacerbate the problem of excess currency in the consumer sector as people frantically endeavor to transform their paper rubles into physical goods.

From the Soviet government's point of view, the critical task is to get rid of the ruble overhang that thwarts all efforts to increase productivity through the reforms of perestroika. It is impossible to coerce Soviet citizens to work harder in exchange for higher wages or bonuses when they already possess more rubles than they can possibly spend. Gorbachev's early emphasis on introducing "brigades" among laborers to encourage higher levels of performance lost its momentum when it became clear that hard-working laborers were simply paid more of the same useless money as those not willing to put forth any extra effort. With so many excess rubles floating about, monetary incentives have lost all effectiveness.

If the number of rubles in circulation were slashed through a currency crackdown, the inherent value of the remaining rubles would accordingly go up. Workers could theoretically be persuaded once again to perform at higher levels in exchange for increased monetary rewards. Higher levels of productivity would lead to greater amounts of goods being produced; having more goods available to consumers would reinforce the effect of monetary incentives, which, in turn, would further help to solidify the currency.

The burden of the overhang is so stultifying and the possibility of eliminating it through monetary reform is so appealing that officials in Moscow are no doubt drawn to this approach. By declaring a substantial portion of the outstanding currency worthless, they see the possibility of being able to move ahead on perestroika, knowing that the ruble wreckage of past budgetary mismanagement has been safely neutralized. A domestic currency revaluation would offer a "clean slate" approach to dealing with the current fiscal breakdown.

An additional political side benefit would be the obvious message imparted to overly zealous profiteers and cooperatives that they had better stick to legitimate production methods rather than attempt to reap monetary gains by diverting state-produced goods into private hands. The stigma of engaging in black-market activities is still sufficiently powerful to dissuade many Soviet Citizens from revealing their private cash hordes to public officials. Those citizens who have so far not been able to take advantage of profiteering opportunities in a regime of fixed prices will likely find it gratifying to see the more free-wheeling types dealt with sharply.

The overall impact of a domestic monetary crackdown would be to reassert state control and to emphasize that the fate of the individual—his wealth, his standard of living, his ability to exercise initiative in procuring goods—is determined by the Soviet government.
It would be a call for discipline and central planning, a blow against self-determination, private risk-taking and market solutions. The government would assert a strong association between corrupt behavior and entrepreneurship; would-be capitalists would be portrayed as exploiters of the rest of the members of socialist society.

A confiscatory currency revaluation would have a powerful psychological impact and would temporarily mitigate consumer purchasing power. However, it would not provide a long-term solution to the problem of uncontrolled money creation by the Soviet government. That is, it would represent a new starting point but would not provide any safeguards to maintain the proper balance between the amount of goods available and the amount of currency in circulation. Without accompanying constraints on government spending, a domestic monetary crackdown would be no more than an intrusive attempt to treat the symptoms—not the underlying cause—of Soviet economic deterioration.

The value of outstanding rubles is increased only to the extent that a significant portion of them are cancelled. Changing the denomination or the color of the currency alone adds nothing to its intrinsic value. Nor does a domestic monetary crackdown transform the ruble into a convertible currency for use in foreign trade.

FREE ECONOMIC ZONES

A different approach, one favored by more radical Soviet economists, is to establish free economic zones in which joint ventures and Soviet enterprises would be allowed to work productively together without bureaucratic interference from Moscow. Firms operating within these zones would be exempt from tariffs, enjoy very low tax rates, and use their own special currency. What kind of currency? Academics at the Institute of Economics of the World Socialist Systems (headed by Oleg Bogomolov) want to reintroduce the chervonets, which is a gold-backed ruble issued in the 1920s under Lenin’s New Economic Policy. Government officials would prefer to use a mixture of soft rubles and dollars.

The problem with special zones, though, is that they create a two-tiered economic system for the distribution of goods and currencies. Innovative people soon figure out ways to arbitrage the advantages of the free zones against the rigidities of the larger system. In China, for example, raw materials have a tendency to disappear from state planning channels and then to reappear in the economic zones where they can be put to work earning precious foreign exchange to pay for imported Western machinery.

In theory, the free zones should act as catalysts for the entire economy, ultimately transforming the system in accordance with free market principles. But in reality, the special zones function in isolation as special revenue centers. Their existence serves to
highlight and exacerbate the shortcomings of the national economy, rather than relieve them, because authorized distribution channels are distorted. When central planning types sense they are losing ground to the more efficient market-oriented free zones, they typically move to close down their competitors. Accusations of corruption and greed are generally deemed sufficient grounds for expropriation. Unless the government is committed to the free market "laboratory" as a shining example for national economic transformation, the free zone approach will be hailed as an example of capitalism run amok and accordingly abandoned.

In the meantime, as the free sectors develop an economic and financial momentum of their own, the existence of dual currencies operating within the same country—for example, gold-backed rubles in the special zones versus soft rubles in the main economy—leads to monetary chaos and hyperinflation in the paper currency. Such a situation occurred when gold-backed rubles were allowed to circulate in conjunction with paper rubles following Lenin's decree in October 1922. As Nikolai Petakov noted in his August 1987 article in Novy Mir concerning this period in Soviet monetary history:

It's curious that the law was not forcing anyone to take the chervonets. People started chasing it themselves. . . . It was a short but unusually colorful and didactic period of two currencies: The Soviet banknote falling in its buying ability, the chervonets steady as a rock. . . . In the first weeks of its existence the chervonets was a currency for large enterprises. . . . In the private sector mainly Soviet banknotes continued their circulation. To guarantee the priority of the socialist sector, the State Bank began the broad emission of the Soviet banknotes. Their buying ability started to fall catastrophically. The demand for the chervonets drastically escalated.1

In Petakov's judgment, running parallel currencies had the effect of alienating the village-dwelling peasants, who were effectively forced to use the deteriorating paper money, from the richer city-dwellers, who had access to the gold-backed money. As Petakov goes on to explain:

"Dual power" of the currencies turned out to be useful neither for traders nor for peasants. According to L. N. Yurovsky, "absolutely abnormal relationships between the cities and the villages were being created. Richer peasants already had some chervonets, but for the peasant masses the chervonets was still too expensive and unaffordable. It was still a rarity in villages. But the peasantry already realized that getting a Soviet banknote for their goods was a very unprofitable operation. . . . At a market, a peasant would check on the prices of nails, printed cotton, and so on, and after doing that he would sell just enough goods to buy a pound of nails or 5 measures of fabric. He could have sold 10 pooids [an old Russian measure equal to thirty-six pounds] of linen, but he would

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1Nikolai Petakov, The Gold Chervonets Yesterday and Tomorrow" (Zolotoi chervonets vchera i zavtra), Novy Mir, August 1987, p. 213.
take to the market only 1 pood, and still have (more than half) leftover to take back to the village. The supply of agricultural products started shrinking. The prices for agricultural products were increasing.\(^2\)

Operating free economic zones with their own special currency could end up producing results exactly opposite to those intended. The premise is that the special economic sectors will convert the rest of the economy. Free market mechanisms and production management techniques are introduced in limited areas; these prototype methods are then emulated and allowed to sweep across the economy at large. Eventually, the free market areas and the larger economy are integrated, ultimately becoming indistinguishable as the entire country adopts the superior production and financial approaches of the experimental sector.

What happens in fact, though, is that the differences between the special sectors and the main economy become more and more pronounced over time. The free sectors attract investment capital, physical resources and ambitious workers; the stale larger economy grows ever more depleted. As people likewise abandon the paper money in favor of the gold-backed money, the paper rubles become even less valuable than before. If there is no social or political resistance to the ever-increasing prosperity gap between the functioning free zones and the depleted sectors of the status quo economy, it is conceivable that the transformation could successfully take place.

But more often, social frictions spawn political pressures that oppose the uneven distribution of wealth based on free market allocative processes. The free sectors are never integrated into the economy at large, but continue to operate as separate and limited cases on the fringes of the host country. So long as they furnish useful economic and financial benefits to the government, they are permitted to exist. But they have no inherent legal legitimacy.

When the currency is worthless, as Petrakov pointed out, the producers within the economy, particularly those who supply agricultural produce, simply refuse to give up physical, consumable goods in exchange for so much ruble trash. Instead, they resort to barter, which is always less efficient than currency as a means of distributing economic resources. The economic loss is borne by the entire nation as trade among members of society is seriously curtailed for lack of a medium of exchange. Hoarding becomes common as people keep tradable goods on hand, rather than their cash equivalents, to be utilized at some future date when a desired good or service becomes available. Hoarded goods are

\(^2\)Tbid.
subject to spoilage and other costs associated with maintaining inventory. All of which constitutes an additional economic loss to society.

GOLD CONVERTIBILITY

Rather than limit the circulation of a gold-backed currency to special economic zones, the Soviets could move to adopt gold convertibility for the ruble in general. In a speech before the Institute of the USA and Canada in Moscow in September 1989, Federal Reserve Board Governor Wayne Angell put forward the suggestion that the Soviets should consider adopting a gold standard as a means of providing monetary discipline. He explained that a gold-backed ruble could bring about long-term stability and impart instant Soviet credibility in world capital markets.

Angell’s prescription deals directly with the crux of Gorbachev’s economic problem. Soviet citizens have no real incentive to respond to domestic reforms. The outside world has no real incentive either, except possibly fear of increased destabilization in the Soviet Union, to respond to Moscow’s requests to join the global trade community. A gold-backed ruble would satisfy the Soviet Union’s need for both a solid domestic money and a convertible currency. As Angell told a Soviet state bank representative:

Your perestroika reforms face many difficult adjustment problems as you move toward market-oriented socialism. These become impossible problems without a monetary standard of value that is recognized as having predictable value throughout the Soviet Union—and the rest of the world—now and in the future. Having such a standard for your money would ease the difficulties of all your adjustment problems. I believe the first thing your government should do is define your monetary unit of account, the ruble, in terms of a fixed weight of gold, and make it convertible at that weight to Soviet citizens, as well as to the rest of the world.⁵

Even before this advice was offered, Soviet citizens were endeavoring to carry out convertibility on their own. According to official statistics, retail gold sales in the Soviet Union during the first six months of 1989 were 45 percent higher than in the first half of 1988. More than half the jewelry shops in Moscow reportedly have sold out of gold. Nevertheless, Soviet citizens are still lining up outside jewelers’ doors in the hope that they can turn their rubles into gold, silver, diamonds—any kind of gem or metal with genuine value.

Turning to gold and other valuables is, of course, a traditional way to flee a deteriorating currency. While the supposed "metal content" of the ruble is meaningless today because people are not permitted to actually redeem their paper money for gold, it reflects the heritage of the earlier connection between the amount of rubles in circulation and the gold reserves of the Soviet government. Lenin's gambit to restore discipline to the nation's financial, credit, and monetary system by introducing the gold-backed chervonets proved successful once the decision was made to abandon the paper rubles. The gold-backed money became the new currency of the Soviet state, driving out the old currency (which at the height of the hyperinflation, was being issued at growth rates of 50 to 70 percent a month). The chervonets soon provided a stable monetary unit.

Gresham's well-known law would dictate that it is the less valuable currency that would displace the more valuable one. But that notion is based on the assumption that both kinds of currency are acceptable as legal tender and that the holder seeks to maximize his welfare by using the cheap money to make purchases while at the same time retaining the money with the higher internal value (usually based on metal content) as a store of value or to melt down for sale as a commodity. Gresham's Law assumes the existence of an information asymmetry; the holder of the money knows its true value, while the person accepting the money does not. When information is symmetrical, and when sellers refuse to accept the inferior money, the opportunity to pawn off the cheap money disappears. The solid money then becomes the dominant currency.

Marx, who believed that a socialist society could dispense with money, would not have approved of Lenin's decision to issue the chervonets, which represented a throw back to tsarist practices. Indeed, the People's Commissar of Finance, C. S. Sokolnikov, stated early on that "finance should not exist in a socialist community." But Lenin understood that the drastic credit and currency reform was necessary to save the fledgling Soviet state.

According to Abel Aganbegyan:

Lenin attached special importance to the problem of banking and its organization, the development of finances and money turnover under Soviet control. He wrote that the circulation of money was one of those things which, if not kept in order, meant the whole of the economy was not in order.

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These days in the Soviet Union it is Lenin, not Marx, who is seen as possessing the greater insight on matters economic and financial, and it is the NEP approach that is taken as a model of reform.

Why then doesn't Gorbachev simply adopt this element of Lenin's earlier program and make it a part of his own strategy for economic restructuring? The Soviet Union is the world's second largest producer of gold and holds substantial gold reserves; more than $30 billion worth according to CIA estimates. That alone gives it tremendous credibility for offering a gold-backed currency. Considering the USSR's lack of experience in Western capital markets and its well-publicized economic deterioration, access to gold may soon turn out to be Gorbachev's only viable means of entry into Western financial circles.

But Soviet officials balk at the idea for one very good reason. They fear that making the ruble convertible into gold would lead to a run on Soviet gold. Unable to control the amount of ruble claims in circulation, the Soviet government might find itself forced to redeem paper money for physical gold bullion at an alarming rate. As gold reserves drained out of Soviet treasuries, officials in Moscow would likely panic and decide to close the gold window. Nothing would be more damaging, at home or abroad, than to have the Soviet government shortly renege on a pledge to convert rubles to gold on demand.

Soviet officials need to understand that going on a gold standard is a necessary, but not sufficient, condition for achieving financial and monetary order. Just as Lenin accompanied the move to the chervonets with a comprehensive program for balancing the state budget and controlling the extension of credit, so too would Gorbachev have to implement measures to reduce substantially the existing budget deficit and eliminate it in the future. The whole rationale behind a gold standard, after all, is that it deters government from running deficits and resorting to printing up excess money to finance them. The paper currency ends up coming back to haunt them at the gold window.

Unless the Soviet government takes specific, radical action to cut expenditures, unless it moves to increase future revenues by diverting resources out of the military sector, which is basically unproductive, and into manufacturing for the consumer sector, which is the source of real economic production, it cannot solve its budget deficit problem. If Moscow cannot solve its deficit problem, it cannot get away from the problem of having to finance the shortfall between revenues and expenditures; it would still have to print excess money to cover the difference. Thus, if the Soviets were to go on a gold standard and then continue to run deficits, they would be setting themselves up for precisely the kind of drain on gold reserves they envision so fearfully.
On the other hand, if Gorbachev did proceed with the changes described above—
notably, if he slashed military spending and established Western-style market mechanisms
that would eventually lead to enhanced government revenues—he might have a chance to
make it all work. At the center of a newly prioritized Soviet economy would be the gold-
backed ruble, serving as a source of budgetary discipline and nostalgic pride for the Soviet
Union, and providing the necessary reassurances to the international financial community.

DOLLAR/RUBLE/GOLD CONVERTIBILITY

A major flaw exists if the Soviet Union were to move ahead on a plan to adopt a
conventional gold standard. Unless the world price of gold is somehow stabilized, the Soviet
Union would be either unfairly punished or unfairly rewarded by changes in the extraneous
price of gold. That is, the Soviet government could go on a gold standard, agreeing to redeem
rubles at the rate of, say, 4000 rubles for one ounce of gold; assuming that this ruble/gold
exchange rate properly reflects the perceived value of the currency to its holders, both
domestic and foreign. So long as the Soviet government maintains a balanced budget and is
not suspected of cheapening its rubles by printing too many of them, people should be
perfectly satisfied to hold the currency.

If, for reasons having nothing to do with the Soviets, however, the price of gold
suddenly went up in world markets, people would rush to turn in their rubles for the
promised amount of gold, assuming they could then resell the more valuable gold at world
market prices and increase their purchasing power with respect to imported goods. By the
same token, if the price of gold suddenly went down in world markets, again for reasons
having nothing to do with the Soviets, people would rush to turn in their gold for the rubles
that would provide relatively expanded opportunities to purchase domestic goods. In the
first case, the effect would be deflationary. In the second case, the effect would be
inflationary. In either case, the Soviet Union would experience monetary distortions not
corresponding with its own degree of fiscal integrity.

These direct effects, reflecting the relative desirability of gold or rubles, would occur
only if Soviet citizens were free to transform ruble holdings or actual gold into foreign
exchange and then purchase goods employing the medium of exchange with the greater
buying power. If rubles and gold were not freely convertible into foreign exchange, the
impact of changes in the price of gold (given a fixed ruble/gold exchange rate) would be
reflected in a somewhat different way. If gold prices rose, Soviet imports would increase
because the value of the ruble would rise relative to foreign currencies; domestic goods priced
in rubles would be relatively high and imports would thus become more attractive. By the
same token, a drop in the world market price of gold would make Soviet-produced goods relatively cheap and would inordinately stimulate exports on the basis of artificial financial signals. A fluctuating currency, whether due to exogenous changes in the price of the underlying commodity to which it is linked or as the direct result of deliberate monetary manipulation by the government, would undermine the stability so vital to rational economic development in the Soviet Union.

The only way to be protected from gyrating world gold prices and misleading price signals would be to appeal to a major gold reserve country to anchor the monetary value of gold by linking the value of its own currency to it. The United States, ironically, is the most logical choice. Not only does the United States have the necessary gold reserves and international financial presence, but also the most recent experience in providing the world’s key currency through dollar/gold convertibility.

The foundation of the international economic order put into place at the close of World War II was the link between the dollar and gold. The Bretton Woods system, structured by John Maynard Keynes and Harry Dexter White, decreed that the U.S. dollar be convertible into gold by central banks at the rate of $35 an ounce and that all other currencies be tied at fixed exchange rates to the dollar. Thus the global community, represented by the 45 original participating countries, effectively went on a gold standard with the U.S. dollar serving as the key currency. For some 25 years, until the Nixon administration decided to suspend dollar/gold convertibility in 1971, the Bretton Woods international monetary system helped bring about a generation of global financial order and economic progress.

An agreement by the United States to fix the value of the dollar to a specified amount of gold for purposes of central bank transactions to cover foreign trade might fall into the category of “technical assistance” from the Bush administration. Given that gold and other commodities are playing an increasingly important role in providing price signals to the Federal Reserve for regulating the money supply of the United States, the proposal is not so radical as it might sound. Recent pronouncement by Federal Reserve Board Chairman Alan Greenspan suggest a commitment to achieving zero inflation within the next five years, which in turn suggests a commitment to eliminating the U.S. budget deficit over a similar time period. Both objectives are entirely compatible with adherence to a gold standard.

A gold-backed ruble operating in tandem with a gold-backed dollar would permit more progressive Soviet republics, such as the Baltics, to determine their best trade and investment opportunities without bias; to the extent they stand to benefit from importing certain raw materials and energy from the Soviet Union, they could continue to do so without jeopardizing their fiscal relationship with the West. The argument over whether or not the
Baltics can survive economically without the Soviet Union would be resolved financially, rather than politically or militarily. From Moscow's point of view, it would be far better to provide Latvia, Estonia, and Lithuania with an acceptable Soviet currency, one that could be used for trade with the West, than to permit them to develop their own separate currencies (which they most assuredly will do in the absence of a reformed ruble; even now they are demanding alternative currencies so they can reap the benefits of their newly won economic independence).

By definition, gold-backed rubles and gold-backed dollars would be convertible into each other at a specific exchange rate. Any deviation from this rate would reflect, not the value of gold, but the value of the respective government's promise to redeem. One major advantage to the Soviets, then, would be that it would allow them to attract significant outside investment because Western businessmen and bankers would no longer have to be concerned about the effect of an artificial ruble exchange rate on the repatriation of revenues. While the Soviet government would no longer reap profits as the exclusive importer of Western consumer goods, it would benefit from a reversal of worker attitudes toward monetary incentives inasmuch as Soviet citizens would have the ability to purchase Western goods directly for themselves. Within the Soviet consumer economy, imports from the West continue to function as super stimuli.

In appealing to the Bush administration for cooperation in gaining monetary discipline, the Soviet Union could stress that the United States would be doing itself a financial favor. The best prospects for lowering the U.S. budget deficit derive from the possibility of significantly reducing defense expenditures. The extent to which it is possible to do that depends largely on Soviet actions. If the United States provides the necessary safeguards for the Soviet Union to go on a gold standard by volunteering to anchor the monetary value of gold, the restraint imposed through ruble/gold convertibility would likely prove more effective in curtailting excessive Soviet military spending than any arms control treaty.

Giving a country something to lose in terms of international dignity serves to suppress aggressive inclinations. If the Soviet Union were to engage in behavior which, in the eyes of the world, threatened its capacity to maintain a stable currency, businessmen and governments could be expected to convert gold-based ruble holdings into more solid currencies, such as the dollar. The curtailting effect of witnessing an outflow of gold in response to an unwarranted increase in the money supply would be powerful indeed.
CONCLUSIONS

It's clear that the Soviets must pay immediate attention to the currency question. If Moscow does not offer some sort of solution, political activists will initiate solutions of their own. According to Blair Ruble, director of the Kennan Institute for Advanced Russian Studies, people in Leningrad are already vigorously seeking economic self-rule and financial autonomy from Moscow. A number of proposals are circulating in that city, "including one formal proposal that all of its economic activity be conducted either in U.S. dollars or in a new local currency, the Peterburgets."\(^6\)

Assuming, then, that Gorbachev will soon be compelled to initiate monetary reform, what approach is he likely to take? If Soviet officials impose a domestic currency crackdown, they will be exercising traditional budgetary priorities. The seigniorage to the state from such a move would be drawn entirely at the expense of the consumer sector and would accrue largely to the military sector. Soviet monetary channels function on a two-tier basis; thus the state-owned enterprises and industrial operations would be left largely untouched by a monetary crackdown because their finances are handled through deposit accounts under the administration of Gosbank. It is the Soviet population that would suffer a financial loss in the form of diminished savings and expropriated cash.

Unless Gorbachev abandons his expressed commitment toward free markets and democratic reform, the Soviet government probably will not go the domestic crackdown route. On the other hand, a conservative leader wishing to reassert discipline and state control would be likely to initiate this type of monetary reform, for psychological reasons as well as financial.

Several of Gorbachev's economic advisers have issued statements to the effect that such a crackdown would not be forthcoming. The Soviet Minister of Finance went on television to issue a denial of impending monetary reform in July 1987 to counter widespread rumors. Earlier, following the publication of a letter to Pravda in February 1986 advocating currency reform, the chairman of Gosbank was also forced to issue a denial. Yet it is conceivable that sentiment in favor of free markets will be ultimately replaced by more repressive, authoritarian impulses—in which case, a reversal in the movement toward liberal economic reform would likely be accompanied by equally heavy-handed and counterproductive actions in the monetary sphere.

If the Soviets pursue the free enterprise zone approach to reform, permitting the circulation of a separate currency within certain designated areas, they will experience a

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gain insofar as obtaining greater access to Western imports. The military will benefit as the recipient of increased levels of transferred technology facilitated through the use of special convertible currency within the free zones. To the extent consumer goods also find their way into the country via the free zones, their distribution and resale is likely to be controlled by the Soviet government. (As Soviet economist Larissa Piyasheva has noted, however, the Soviet government may find itself forced to put barbed-wire fences around the free enterprise zones to keep ordinary Soviet citizens out.) By maintaining a dual currency system, the Soviet government is able to obtain huge ruble profits by purchasing the goods in the special currency and reselling them to the Soviet government at exorbitant ruble prices. The real profit to the Soviet government is only the difference between the imputed value of the domestic ruble and the price paid to the foreign supplier. But if the transaction is recorded in rubles at both ends, with an official exchange rate overvaluing the domestic ruble, the paper profits from foreign trade can be used to reduce the state budget deficit.

The fact, though, that Nikolai Petrakov took such exception to the idea of running parallel currencies (based on the negative experiences of the 1920s) suggests that this approach may be derailed in spite of support from other prominent Soviet economists, notably Aganbegyan. When Petrakov was named Deputy Chairman of the Planning and Budget Committee of the Supreme Soviet in early 1990, it boded well for prudent and progressive monetary reform. His attitude toward Soviet economic and financial reform would seem to meld well with Gorbachev's own views, which seek to promote socialist values in conjunction with free market efficiency. Petrakov favors the idea of "humane democratic socialism," combining communist principles and capitalist practices. In an essay urging reformists not to denounce everything associated with communism just for the sake of adopting new methods, he observed, "The communist ideal dates back more than a thousand years."7 Petrakov views the NEP approach initiated by Lenin as a useful model of fiscal pragmatism.

How seriously does Petrakov advocate returning to a gold-backed ruble as the single currency of the Soviet Union? The title of his provocative article in Novyi Mir—"The Gold Chervonets Yesterday and Tomorrow"—is perhaps prophetic, not merely a scholarly whimsy. It's obvious that Petrakov has great appreciation for the era of the 1920s during which time "the Soviet chervonets became a respectable monetary unit not only within the country, but also in the international currency markets."8 He strongly believes that it was the shift to a

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healthy currency, i.e., the adoption of the chervonets, that made it possible to begin the work for socialism under the new Bolshevik regime. He does not, however, issue the call to return to a gold standard in his article. Instead he emphasizes in somewhat vague terms the need to strengthen the ruble, stating that it is not possible to restructure the Soviet economy in the absence of a "healthy, effective system of money."³⁹

For all his arguments in favor of restoring "commodity-money" relations, it may be that Petrankov shares the concern of his colleagues about the possibility of a run on Soviet gold. (Citing the views once again of Piyasheva, the problem with a gold standard is that all the Soviet Union's gold would end up in Switzerland.) It's true that if paper rubles were presented en masse for redemption into gold, the resulting drain on Soviet bullion reserves would leave the country considerably poorer in one of its most treasured assets. The resulting strain on the budget would hit high-priority Soviet spending, i.e., for military and fixed capital investment, especially hard. These sectors receive their funds from the government and provide no direct benefits to individual Soviet consumers. Thus a switch to a solid currency, such as a gold-backed ruble, would have the effect of focusing resources on the consumer sector at the same time that allocations from the government were being cut to meet the budgetary restrictions called for under the gold standard.

For Soviet consumers, the appearance of a gold-backed currency would be sufficient to bring hoarded goods out of the woodwork. The government might soon discover that the standard of living was considerably higher under a gold standard. However, that fact would not necessarily relieve the budgetary burden of having to provide subsidies. Poorer members of Soviet society would clamor more than ever for "humane" distribution of consumer goods. There could even be a political backlash if the move to a gold-backed ruble was perceived as a vestige, not of Lenin during the NEP, but of earlier tsarist regimes (hearkening back to the gold standard of 1897) and the resurgence of Russian nationalism.

One factor that has become increasingly important to Gorbachev is the need to secure the cooperation and approval of the United States in fostering the objectives of perestroika. For this reason, Gorbachev might be attracted to the monetary reform approach that calls for introducing a gold-backed ruble in conjunction with a gold-backed dollar. In terms of financial mechanics, a U.S. commitment to anchor the monetary value of gold would mean only that the soundness of the Soviet currency system was insulated from external fluctuations in the value of gold. Because price changes could be either beneficial or detrimental, depending on their direction, the commitment would basically be a neutral one.

³⁹Ibid., p. 220.
But the public relations impact of engaging the United States as a financial partner would be extremely valuable, especially as the dollar is already beginning to surface as an alternative currency within the Soviet Union.

This fourth approach would have the effect of reducing military spending because ruble/gold convertibility requires a strictly balanced budget and the most obvious savings are to be achieved in the military sector. It would also deliver a higher standard of living in the consumer sector because it would strengthen joint venture activities and elicit greater production from the agricultural sector and private cooperatives.

The first indication that the Soviets were preparing to move to a gold-backed system would likely be the issuance of a gold-backed bond in Western credit markets. It’s possible that Moscow might at first attempt to keep gold-backed borrowing in foreign markets separate from the question of domestic convertibility. But joint venture partners could force the issue by demanding equal financial treatment. Soviet citizens, as well, could be expected to mount a protest campaign against favoritism toward Western investors.

Indeed, there may not be enough time to launch interim efforts. Changes in the monetary system may have to be carried out in one fell swoop. The Germans are clearly convinced that the transition from central planning to free markets can be driven by currency reform. Chancellor Helmut Kohl has proposed that the strong West German mark be made legal tender across the border where East Germans are bitter at the slow pace of political and economic reform. A senior advisor to Kohl told reporters on February 9, 1990, that East Germany could become “totally insolvent” in the very near future.\(^{10}\) West Germany is proposing monetary union in the belief that only a dramatic signal can help resolve East Germany’s economic crisis. Determining the appropriate rate of exchange between East and West German money is critical; a realistic assessment of the relative values of the currencies will be the first step toward providing a legitimate monetary foundation for East German economic development. Appropriate price signals are necessary for soliciting prudent outside investment as well as guiding the domestic transformation.

The Germans are perhaps recalling their own experience in making an abrupt currency change shortly after World War II. On June 20, 1948, economist Ludwig Erhard, who was later to become chancellor of West Germany, initiated a radical reform program under which the old currency, the virtually worthless Reichsmark, was replaced by a new currency, the Deutschmark. The new currency was convertible into dollars in accordance with the European Payments Union, and thus was effectively pegged to the Bretton Woods

mechanism for international monetary stabilization. The domestic money supply in West Germany was rigidly controlled; at the same time, a free market system was promoted. Because the new currency was connected to an exogenous fixed-rate system, it represented a move to a genuinely solid monetary unit rather than a change in the denomination of bills or some other cosmetic adjustment. According to Henry Wallich, who was serving with the U.S. military government in Germany at the time and who would later become an influential Federal Reserve Board governor, the results of Erhard's monetary initiatives were astonishing:

[It] transformed the German scene from one day to the next. On June 21, 1948 goods reappeared in the stores, money resumed its normal function, the black and grey markets reverted to a minor role. . . . The spirit of the country changed overnight. ¹¹

All these changes represent the sort of economic salvation Gorbachev seeks so desperately. Monetary reform is a crucial factor in determining the outcome of perestroika. Yet while it may be the first necessary step, it is not a panacea for Soviet economic problems. Cooperation from the United States, too, while it might help in stabilizing the results of monetary reform, would provide only a guide wire, not scaffolding.

None of this is inconsistent with what Gorbachev has stated he truly wants from the Bush administration: Not a handout, he insists, but a commitment to a new superpower partnership aimed at integrating the Soviet Union into the global economy. "We are open to cooperation and favorable to new forms," Gorbachev said on the eve of the Malta summit in December 1989. "But we have to implement perestroika by ourselves. All the riches of the West will not be able to substitute for that which we have to do ourselves." Whether the necessary economic and political changes will be carried out under Gorbachev or some other more progressive leader, whether they will be implemented on a national basis or at the level of independent republics, remains to be seen.

13. THE CONTRADICTIONS OF SOVIET DEFENSE
INdUSTRY CIVILIANIZATION

Julian Cooper

From the outset Mikhail Gorbachev made clear his belief that the defense industry should contribute substantially to the revitalization of the civilian economy. At first regarded as a potential aid to industrial modernization, defense sector reorientation was soon viewed as vital to achieving a short-term improvement of the living standards of the Soviet people. At the same time, there has been growing recognition that the Soviet Union possesses a hypertrophied armaments industry, the one-sided, priority development of which has contributed in no small part to the country’s parlous economic state. Now, as defense expenditure is being cut back, there is growing pressure for a decisive demilitarization of the Soviet economy.¹

The Soviet defense industry occupies an important position in the economy. Its precise scale is veiled by distorted relative prices, but in terms of prevailing prices military production accounts for just under 10 percent of gross industrial output, and employs some 4.25 million people, more than 11 percent of the total industrial labor force. In 1988 the then nine ministries of the defense complex possessed 13 percent of the industrial capital stock and employed approximately 6.4 million people.² It has priority access to resources, in terms of both quantity and quality, but does not exhibit superior efficiency in their use. In its planning and management practices the Soviet defense industry is the bastion of the now-discredited administrative-command methods. Until recently it has operated behind a shroud of almost impenetrable secrecy; now its affairs are increasingly being exposed to public view.

From the author’s substantial data base of enterprises and research establishments affiliated to the industrial ministries of the defense complex, 72 percent of enterprises are located in the RSFSR, with particular concentrations in the Central, Urals, Volga and Northwestern economic regions, and a further 17 percent in the Ukraine.³ However, the regional dispersion of enterprises of the older mechanical industries (mainly ground forces

¹For an outspoken statement of this view, see the recent article by Academician V. Avduevskii (Izvestiya, 7 April 1989), all the more striking as most of Avduevskii’s career has been associated with the military-space industry. He also chairs the Soviet National Commission in Support of Conversion.
²See Appendix 1.
³The database contains details of 550 production associations and enterprises, and 220 R&D organizations, including more than a hundred science-production associations. The data base will be published in due course.
equipment, aero-space, and shipbuilding) is different from that of the newer electronic, radio, and communications equipment industries. In the case of the former, 82 percent of enterprises are located in the RSFSR and 13 percent in the Ukraine; but for the latter, 69 and 18 percent respectively, a much larger share is found in other republics. Research establishments are heavily concentrated in the RSFSR (84 percent), with the Central and Northwestern regions accounting for 70 percent of the total: Moscow alone has more than 40 percent of R&D organizations.

In the capital the defense industry accounts for a quarter of all employment, a third of all industrial production, and half of all applied R&D.

Thus to a striking degree the Soviet defense industry is focused on the Russian republic, and this bias is even more pronounced in the manufacture of end-product weapons. Furthermore, facilities outside the RSFSR and the Ukraine appear to employ above average (for their locations) proportions of Russian personnel.

Gorbachev came to power remarkably free from defense sector ties. With the breakup of the formerly dominant Ustinov group of defense industry leaders, closely linked with Brezhnev, political conditions were favorable for the sector’s reorientation. The extension of glasnost, democratization and economic reform was also expected to facilitate these changes.

There are several strands to the policy of reorientation. The long-established civilian activities of most defense sector enterprises have been given new emphasis. Production capacity associated with urgent civilian tasks has been transferred to the defense industry for rapid modernization and expansion of output. Efforts have been made to promote technology transfer to the civilian economy, and, with reduced outlays on defense, a process of partial conversion from military to civilian production and research has been initiated. Finally, leading administrative personnel of the defense industry have been assigned to prominent government posts, taking responsibility for important areas of the civilian economy.

Prior to conversion, the Soviet defense industry already had an extensive civilian role. This role was further enhanced by the 1988 transfer to the defense complex of the enterprises of the former Ministry of Machine-Building for the Light and Food Industries (Minlegpischemash). The defense complex’s contribution to the production of a wide range of civilian products in 1988 is shown in Appendix 2. This provides a base line for analyzing future expansion of output associated with conversion. The defense industry now

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4Moskovskaya Pravda, 24 October 1989.
manufactures an extremely high proportion of the total national output of consumer electrical and electronic goods.

Toward the end of 1987, it was decided that the modernization of the food and light industries would be best achieved by transferring prime responsibility for the manufacture of appropriate production equipment to the ministries of the defense industry. Gorbachev visited an exhibition of food processing equipment at that time, where he examined machines built by the Leningrad "Kirovskii Zavod" and other defense enterprises and was favorably impressed. This suggests that Gorbachev may have had direct involvement in the adoption of the new policy. In the spring of 1988 the defense sector acquired 230 enterprises, generally poorly equipped, employing more than 300,000 workers and having an annual output of some 5 billion rubles and a 1987 profit of 738 million rubles. Many of the enterprises were absorbed into existing associations and have effectively disappeared.

With the adoption of ambitious programs for the production of equipment for the food and light industries, and also retail trade and public catering, the defense industry has been forced to engage some of its military-related facilities. By early 1989 345 basic enterprises and 205 research and design establishments had purportedly been involved. In one stroke the defense industry gained major new responsibilities, so it is hardly surprising that many problems have been encountered. The inherited facilities required extensive modernization; many of their products were technologically backward. Designers without previous experience have been attempting to create modern equipment. They have also been adapting to the new experience of working for relatively weak and ill-informed customers. But the customers have often not appreciated the change, not the least because many prices have risen sharply, prompting complaints of financial extortion by military producers. Within the defense sector, and especially in the aviation industry, there has been mounting criticism of the policy of requiring the established R&D organizations and enterprises to develop and manufacture light and food industry equipment, often of an undistinguished technological level.

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5See Sel'skaya Zhizn', 15 August 1989 for confirmation that the decision was taken at the end of 1987.
8Pravdeer stevenyi Vestinik, 1989, No. 4, p. 2.
9Sel'skaya Zhizn', 21 February 1990.
Notwithstanding the problems of the Minlegpishchemash transfers, the policy of switching capacity from the civilian sector to the defense industry was taken a stage further in 1989. Full information is still not available, but as a consequence of the government reorganization the boundaries of the defense complex have been changed. The newly combined military and civilian nuclear industry now forms part of the fuel and energy complex, but it remains unclear whether its military output is considered part of the output of the defense industry. The new Ministry of Atomic Energy and Industry has taken over a number of equipment supply enterprises previously under civilian machine-building ministries, including the giant Volgodonsk 'Atommash' plant.\(^{10}\)

The defense complex has now gained research facilities and industrial capacity previously under the Ministry of Communications (which had its network of "Promsvyaz" plants). In addition, it appears to have taken over most, if not all, of the medical equipment industry, previously under the instrument-making industry (Minpribor) and also some of Minpribor's computer building facilities. Thirty-five medical equipment enterprises were transferred: the new lead ministry is the Ministry of General Machine-Building, responsible for the missile-space industry.\(^{11}\) Some think the policy should be taken even further: V. Boguslaev, general director of the Zaporozhe Motorostroitel aero-engine-building association, recently claimed that there were 20,000 enterprises losing money and suggested that they should be handed over to the defense industry for modernization.\(^{12}\) As a consequence of these changes, the defense industry now finds itself with a decisive role in meeting pressing consumer and welfare needs and, it is under mounting political pressure to achieve quick results. In addition, there are mounting signs that the new policy does not enjoy wholehearted support either within or outside the defense sector.

The policy of defense sector reorientation has also involved efforts to promote more substantial technology transfer from military to civilian activities. This is not a new policy, but it is now being given an additional impetus, facilitated by the declassification of hitherto secret facilities and technologies. Until recently, much faith was placed in cross-sectoral diffusion through the provision of scientific and technical information, a prominent role being played by the Institute of Inter-Branch Information (VIMI).\(^{13}\) Such transfers were largely

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\(^{10}\)\textit{Robochnaya Tribuna}, 27 May 1990.


\(^{12}\)\textit{NTR}, 1990, No. 3-4, p. 2. Boguslaev appears to be unaware that most of the 20,000 loss-making undertakings are not in the industrial sector.

unplanned and unmonitored. Now more attention is being devoted to mechanisms and procedures for truly effective transfer.

The new transfer policy began to emerge in 1989 and was at first associated with the declassification of materials and other technologies associated with the “Energiya”/“Buran” space shuttle program. Given that the space program in general, and the shuttle project in particular, faced growing pressure for budget cuts, this starting point is not surprising, and support for a transfer policy undoubtedly serves the current interests of the ministry most directly concerned, the Ministry of General Machine-Building. Facilities of this ministry, including the Kaliningrad NPO “Komposit” and the industry’s central technology institute, the Moscow Research Institute of Machine-Building Technology (NIITM), have been at the forefront in transfer efforts. Work has been undertaken on a program for technology transfer covering more than twenty different fields. It is expected that some 400 scientific and technical achievements of the military-space industry will find application in the civilian economy. Declassified technologies are also being offered abroad, with prospects for the creation of joint ventures. An early example is a joint venture agreement between an Italian company and two facilities of the Ministry of General Machine-Building (“Komposit” and “Avangard”) for the development of food industry and other equipment based on composite materials. This new policy of declassifying advanced space and military technologies will probably be used by the Soviet authorities as an additional argument against the maintenance of COMOM controls.

The conclusion of the INF Treaty put the conversion of defense industry facilities on to the policy agenda, and the Votkinsk plant, responsible for the SS-20 and other missiles covered by the agreement, became the first practical example of an attempt to reprofile capacity. With the announcement of unilateral force reductions at the end of 1989, conversion was quickly transformed into a policy matter of the highest priority. Space precludes a detailed discussion of what has now become a complex, multifaceted issue with

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16Izvestiya, 28 February 1990.
Pravda, 1 December 1989.
18For a discussion of the Votkinsk experience see the interview with G. Khromov in Sotsialisticheskii Trud, 1990, No. 1, pp. 3-10. Khromov, acting head of a department of the Military-Industrial Commission, has also contributed a case study of Votkinsk to the forthcoming ILO volume on defense industry employment and conversion.
its own extensive and rapidly expanding literature: the treatment here is restricted to brief consideration of a few significant themes.\textsuperscript{19}

In the past Soviet writers have always maintained that conversion can be more easily implemented in their economy because of the advantages of social ownership and central planning. It is ironic, therefore, that efforts for practical conversion have coincided with economic reform designed to limit the scope of central planning and promote enterprise autonomy and market relations.

The transition to self-financing in the defense industry since January 1989 and the adoption of other reform measures, including the creation of cooperatives, has further complicated the conversion process. It has also made the planning of conversion a more controversial issue than would have been the case in the absence of economic reform. Two different philosophies were in contention: a traditional, highly centralized approach based on administrative, top-down planning, and an alternative, decentralized, bottom-up approach claimed to be in the spirit of economic reform.\textsuperscript{20} The traditional approach has been employed for the elaboration of the State Program for Conversion of the Defense Industry during the period to 1995. This basic planning document for conversion appears to be largely a product of the Gosplan defense industry department, overseen by first deputy chairman V. I. Smyslov, in consultation with the Military-Industrial Commission and the Ministry of Defense.\textsuperscript{21} Promised for the end of 1989, a draft was discussed by the Presidium of the Council of Ministers at the end of February 1990 and a week later by the Committee for Questions of Defense and State Security.\textsuperscript{22} Its delay provoked bitter criticism, including an extraordinary attack on the competence of the Council of Ministers and, by implication, Prime Minister Ryzhkov, by Baklanov, Central Committee Secretary for the defense industry.\textsuperscript{23}

The draft State Program is a classified document and only partial details will be made public.\textsuperscript{24} From the evidence available, it is possible to estimate the envisaged scale of conversion; an analysis is presented in Appendix 3. The defense complex's civilian

\textsuperscript{19}The author is preparing an extended discussion of conversion for a forthcoming publication of the Royal Institute for International Affairs, London.

\textsuperscript{20}From the outset the most articulate critics of the traditional approach have been A. Izumov of the Academy's USA Institute (see, e.g., Novoe Vremya, 1988, No. 30, pp. 21-22 and Literaturnaya gazeta, 1989, No. 28, p. 11, pp. 21-22) and A. Kireev, an economist attached to one of the departments of the Central Committee (e.g., Novoe Vremya, 1989, No. 4, pp. 14-17 and Trud, 5 May 1989).

\textsuperscript{21}See Poisk, 1990, No. 10, p. 4.

\textsuperscript{22}Izvestiya, 28 February 1990; Soviet News, No. 6517, 14 March 1990, p. 90.

\textsuperscript{23}Pravda, 15 February 1990.

\textsuperscript{24}Poisk, 1990, No. 10, p. 4. This highly critical article also reveals that A. D. Avdukevskii, chairman of the National Commission in Support of Conversion, has been denied access to the program, which may explain the outspokenness of his recent Izvestiya article (7 February 1990).
production will double between 1989 and 1995, and in the latter year will represent more than 60 percent of total output. In 1995 conversion will augment total civilian industrial production by approximately 5 percent. As a share of total industrial output, military production will decline to 7 percent, as compared to 9 percent in 1989. Details of plans for the expansion of output of certain civilian products are presented in Appendix 4, while Appendix 5 presents some fragmentary evidence on planned reductions of military output.

One of the most controversial issues of conversion is the question of priorities: which civilian goods are to have first claim on released capacity? From the outset, the Party and government authorities, probably reflecting Gorbachev's personal view, have consistently argued for top priority to consumer-related products, above all equipment for the food and light industries, consumer goods and medical equipment. Electronics, computing, and civil aircraft and shipbuilding rank lower in priority.25 In accordance with these priorities, since early 1989 conversion has focused on consumer and welfare goods, as enterprises have attempted to adapt to reduced military orders. Enterprises have often found themselves under pressure from their ministries, local party organizations and Soviets to organize rapidly the production of goods in short supply, often with little regard to the correspondence of their technological level to the production possibilities of the enterprises concerned. The officially upheld priority ranking, coupled with negative practical experience, have generated mounting opposition to the conversion policy.

Some academic critics, and many representatives of the defense industry itself, believe that the official approach to conversion is misguided. They argue that first priority should be granted not to consumer goods, but to technically complex products that will contribute to economic modernization and the country's export potential. The export proceeds, it is often argued, should be used to import consumer goods or to increase capacity for their manufacture. The aviation industry has been most energetic in promoting this view, but similar arguments have been advanced in other branches. By the spring of 1990 Gorbachev himself began to argue in favor of conversion to high technology civilian products, suggesting that the critics of the initial policy had successfully made their point.26

Another policy issue concerns the spread of conversion: should it be realized on a partial scale at many enterprises, or concentrated at a small number of facilities, wholly, or substantially, freed from military work? The evidence points to the adoption of the former option. According to the draft State Program, more than 400 enterprises, supposedly 40

26See Pravda, 28 April 1990 (comments by Gorbachev during his visit to Nizhni Tagil).
percent of all defense enterprises, will undergo some degree of conversion. So far, only three enterprises have been identified for complete conversion, but they are not major facilities and prior to conversion military production was a minority activity. The defense sector ministries appear reluctant to permit full conversion, involving permanent withdrawal of capacity from military production, preferring an "equal misery" approach obliging many enterprises to combine military and civilian production, even though the retention of military output, at a reduced level, may not permit the genuine conversion of facilities to specialized civilian work. One of the authors of the State Program, V. Kotov has confirmed that the official approach to conversion is to keep open the option of increased military production in case of necessity. Enterprises cannot be fully converted and effectively removed from the defense industry, he maintains, because all defense enterprises must retain secret, "regime" facilities. This policy may reflect successful lobbying by the military, as also may the reference in the draft program to the development of "dual use" technologies, identified as the "most progressive" direction of conversion.

Since the adoption of the conversion policy, many enterprises and R&D organizations have been faced with the need to cope with reduced military orders. Undoubtedly, there has been much "pseudo-conversion"—the expansion of civilian output, often well-established at the enterprises concerned, with little or no actual repurposing of production capacity. But it would be wrong to classify all conversion to date as purely cosmetic. Some enterprises, like the Votkinsk works, appear to be engaged in genuine transformation of capacity. Many difficulties have appeared, partly stemming from the unplanned and haphazard way in which conversion has proceeded. A major problem has been the impact of conversion on enterprise financial viability. The value added during one hour of work on military products tends to be substantially higher than equivalent work on civilian goods, with negative consequences for enterprise profitability and the earnings of the labor force. As reduced military orders usually relate to older types of equipment in production for many years and having high profit margins, even modest cutbacks can almost entirely eliminate enterprise

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28The three enterprises are the Yuryuzan' and Yoshkar Ola munitions works of the Ministry of the Defense Industry (formerly Minmash), and the Kiev Leninskaia Kuznitsa's shipyard (Pravda, 28 August 1989). In 1988 the shares of military production were, respectively, 19, 38, and 20 percent of total output (information supplied to the ILO: Disarmament and Employment Program, Working Paper No. 16, March 1990, pp. 14-15).
29Pozd., 1990, No. 10, p. 4. That the conversion program provides for the retention at all enterprises of a research and production potential in the event of the need to increase military output has been confirmed by Yu. A. Glybin, head of Gosplan's summary department of the defense complex (Ekonomika i Organizatsiya Promyshlennogo Proizvodstva, 1990, No. 5, p. 164).
30Izvestiya, 28 February 1990.
profits and, as a result, can render them unable to create funds for incentive and social development. The maintenance of the latter is considered essential in order to retain skilled personnel. This problem has become more acute as personnel, especially younger skilled workers and specialists, have begun to leave defense industry enterprises in order to join cooperatives. There is no doubt that for the defense sector this is now encountering serious problems, partly induced by the uncertainties of conversion. Enterprise directors have been calling for action, in particular the adoption of a Law on Conversion that will provide a legal framework to ensure that conversion causes no deterioration of conditions of employment.

Meanwhile, budget funds are being used to compensate for lost earnings: wages at the Tula "Shtamp" munitions plant, for example, have been protected by a 50 million ruble subsidy. In 1990 total allocations to maintain enterprise wage funds will reach 330 million rubles. Any expectation that conversion could provide a means of enhancing civilian capabilities with a minimum of investment has now evaporated. Very soon after the adoption of the policy, leading representatives of both the defense industry and the armed forces began to argue that conversion would be a costly process requiring substantial additional capital outlays. Indeed, this complaint may be a means of exerting pressure on the authorities to moderate the conversion drive. In connection with the State Program to 1995, it is estimated that 40 billion rubles will be required for funding technical re-equipping and retraining. On the other hand, there will be savings from reduced levels of investment for military production. The plan for 1990 provides for centralized state investment in the defense complex of half the level originally foreseen in the five-year plan, and it is claimed that construction work on 300 new defense enterprises has been halted. Some may be completed as civilian facilities.

A controversial aspect of conversion is the reduced level of funding for military R&D and the partial switch of defense-related research and design facilities to civilian work. As part of the unilateral cuts, it is envisaged that Ministry of Defense budget funded R&D will be reduced by 15 percent during 1989-91. In 1990 R&D funding is to fall to 13.2 billion rubles, compared with 15.3 billion rubles last year (a 14 percent reduction, suggesting that all envisaged cuts have been undertaken), and it has been revealed that in 1991 45 percent of

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31 *Investiga*, 8 February 1990.
33 BBC, SWB, SU/0708 C/2, 9 March 1990.
34 SSA, 1990, No. 2 p. 18 (L. Vid, deputy chairman of Gosplan).
35 *Moskovskaya Pravda*, 24 October 1989 (Belousov).
the defense R&D potential will be devoted to civilian purposes.\textsuperscript{36} An indication of the intended reorientation within individual ministries is provided by plans for the Ministry of General Machine-building: in 1989 the share of military R&D was two-thirds; by 1995 it will fall to 55 percent.\textsuperscript{37} Prominent representatives of the armed forces have not concealed their reservations about the R&D cuts; these doubts are also shared by V. Lapygin, chairman of the Supreme Soviet's Committee for Questions of Defense and State Security.\textsuperscript{38} Within the defense industry some of the R&D conversion now under way has provoked outspoken opposition, above all from leading representatives of the aviation industry, who have been campaigning with vigor against what they consider the inappropriate use of the industry's design skills.\textsuperscript{39} There is no doubt that military R&D reduction and conversion are issues provoking considerable discontent.

Notwithstanding persistent criticism, almost all the civilian activities of the defense complex are being undertaken by the traditional methods of central planning. Most defense sector enterprises have state orders for almost their entire output, covering not only military goods, but also food and light industry equipment, many consumer goods and other civilian items. Some enterprises have shown initiative in the adoption of new economic arrangements, including leasing and the creation of cooperatives to facilitate conversion. The aviation industry's economic research institute has been promoting new forms of collective ownership, but has encountered resistance at the ministerial level.\textsuperscript{40} But these initiatives do not negate the fact that in general the old, centralized administrative-command methods retain their dominance, and this is increasingly a source of discontent within and outside the defense sector.

The problems and uncertainties of conversion have generated doubts, tension, and opposition. In Leningrad, it has been claimed, konversiya is now popularly known as konvulsiya.\textsuperscript{41} Rarely does one find open opposition to the principle of conversion, rather it is the manner in which it is being undertaken that is arousing hostility, with evidence that many defense sector personnel consider the present policy and its implementation

\textsuperscript{36}Krasnaya Zvezda, 1 February 1990; Izvestiya, 28 February 1990 (unfortunately, the definition of “potential” is not indicated).
\textsuperscript{38}See, for example, Krasnaya Zvezda, 5 October 1989 (Akhromeev); Krasnaya Zvezda, 1 November 1989 (Shabanov) and BBC, SWB, SUW0497 C5, 1 July 1988 (Lapygin).
\textsuperscript{39}Examples include M. P. Simonov, head of the Sukhoi design bureau, (Soyuz, 1990, No. 7, p. 14) and R. A. Belyakov of the MiG bureau (Moskovskaya Pravda, 9 December 1989).
\textsuperscript{40}See Kommunist, 1989, No. 5, pp. 24-30 (A. Isayev) and Sotsialisticheskaya Industriya, 19 August 1989. The latter discloses that the adoption of collective ownership at the Saratov aviation works was vetoed by the minister, Sytsov. Isayev is director of the ministry's research institute for economics, planning, and organization.
\textsuperscript{41}Leningradskaya Pravda, 24 November 1989.
incompetent and damaging to their interests. Critical comment on conversion has become a regular feature of Party gatherings, from the Central Committee to republican and city meetings, and of sessions of the Congress of People's Deputies and the Supreme Soviet. The defense sector feels itself to be under pressure and, taking advantage of the new possibilities of informal organization, is beginning to organize as a pressure group. In both Moscow and Leningrad directors of defense sector enterprises have taken the initiative in the formation of associations of state enterprises that are beginning to play a political role.\(^{42}\) Also in Leningrad, there is evidence that some defense industry enterprises have been bases for the emergence of the conservatively inclined Workers United Front. In the Baltic republics, defense industry personnel have been active in the various movements of the Russian inhabitants.\(^{43}\) There have been hints that the Russian dimension may have wider political significance: a prominent missile designer, S. Nepobedimyi, has emerged as an outspoken propagandist of conservative Russian nationalism, with explicit emphasis on the Slavic character of the Soviet defense industry.\(^{44}\) Another sign of discontent is the open advocacy of a more vigorous arms export policy, seen by some, including Nepobedimyi, as a means of avoiding, or mitigating, conversion. M. P. Simonov, general designer of the Sukhoi aviation design bureau, has been prominent in this campaign. Others, including Academician Avduevskii, have made clear their vigorous opposition to any attempt to increase arms exports, arguing that such a policy would contradict the new Soviet international policy.\(^{45}\)

A contradiction of recent times has been the parallel development of defense industry civilianization and the rise to prominence in government of personnel with military sector backgrounds. This has been a deliberate policy, promoted in particular by Ryzhkov, who has not concealed his high opinion of the qualities of the leaders of the defense industry. In his words, they stand a "head higher than the rest."\(^{46}\) Following government changes in the summer of 1989, two of the three first deputy chairmen of the Council of Ministers, half of the deputy chairmen, and more than a fifth of the remaining ministers and state committee

\(^{42}\)The Leningrad association was created first, under the chairmanship of G. Khizha, the energetic general director of the "Svetlana" association, and from the start became an active, campaigning body (Leningradskaya Pravda, 26 August 1989; Trud, 6 January 1990). The equivalent Moscow body is the Union of State Scientific and Production Enterprises, headed by V. Mikhailov, director of the radio industry's TsNPO "Vympel" (Moskovskaya Pravda, 21 December 1989).

\(^{43}\)A notable example is V. Yarovel, director of the Tallinn Vypolzhat plant, the principal military enterprise of Estonia, who chairs both the United Soviet of Labor Collectives of Estonia and the Committee for the Defense of Soviet Power and Civil Rights (Rabochaya Tribuna, 23 February 1990).

\(^{44}\)Vosh Sotsromnik, 1990, No. 1, pp. 3-5 and Sovetskaya Rossiya, 2 March 1990. In these articles Nepobedimyi does not reveal the likely origin of his evident disgruntlement: he retired when he was challenged in an election for his post as director (Sovietskii Voin, 1989, No. 22, p. 77).


\(^{46}\)Argumenty i Fakty, 1989, No. 33, p. 2.
chairmen had defense sector backgrounds. If one includes the two military personnel (Yazov, and Volkov of civil aviation) and the KGB chief, one third of the total government now have defense industry or military/security backgrounds. Moreover, such personnel occupy a high proportion of leading posts concerned with economic planning and management.

The reorientation of the defense industry is proving an extremely contradictory and paradoxical process. In pursuit of modernization and the relief of acute economic and social discontent, an ever-broadening range of civilian tasks has been handed over to the military sector. Far from diminishing in scope and influence, it has expanded and now finds itself in a position to determine the fate of the entire project of perestroika. Those committed to demilitarization and a rolling back of the inflated arms-producing sector that has dominated the Soviet economy for over fifty years, find that its tentacles have now extended further than ever into the civilian economy. The embodiment of the methods and culture of the administrative system, the defense industry, with its growing centrality to the overall state of the economy, is beginning to act as a brake on economic reform. The dominance of its personnel in government may now represent a significant source of conservatism in economic affairs. There are also signs that the institutions and personnel of the defense sector are beginning to play a political role contrary to the spirit of reform. Gorbachev, initially free of ties and obligations to the defense industry, now finds that it is increasingly imposing constraints on his freedom of action. In many respects defense industry conversion and reorientation have been mishandled, pursued in ways that have enhanced rather than diminished the sector's influence. Gorbachev, Ryzhkov, and other leaders have to some extent been captives of a technocratic illusion: a belief that the military sector with its superior capabilities could provide the key to a rapid resolution of many of the economy's problems. If the reform process is to continue, Gorbachev may have no choice but to reject this residue of "old thinking" and embark on a course of genuine, far-reaching demilitarization, not only of the economy, but of all aspects of Soviet life.
Appendix 13A
THE SCALE OF THE SOVIET DEFENSE COMPLEX

From the evidence now available it is possible to gain an approximate estimate of the overall scale of the defense complex and its place in the economy. The following refers to the year 1988, i.e., before the reorganization, when the defense complex consisted of the well-known nine ministries. The Ministry of Machine-building for the Light and Food Industries is assumed to remain part of the civilian machine-building complex, as in 1987. Here we are concerned exclusively with the scale of the Soviet defense industry in terms of prevailing Soviet prices and definitions, regardless of their realism or correspondence to international conventions.

VOLUME OF OUTPUT

From Appendix 3, the gross output of the defense complex in current prices for 1988 can be estimated as 118 billion rubles, of which military production is 72 billion rubles. This represents 13 percent of total industrial output for the year (8 percent for the military component). For comparison, in the same year the output of the civilian machine-building complex was 99 billion rubles (Promyshlennost SSSR, M., 1988, p. 170); part of which consisted of military goods.

CAPITAL STOCK

According to Zaikov, the productive capital stock of the defense industry represents 6.4 percent of the total capital stock of the country (Sotsialisticheskaya Industriya, 7 October 1989; note, V. Komarov, a VPK department head, earlier gave a share of 6 percent of the country's total productive capital stock—Pravitel'stvenny Vestnik, 1989, No. 18, p. 11). Table 13A.1 shows the calculation of the 1988 capital stocks of the defense and machine-building complexes.
Table 13A.1  
1988 Capital Stocks  
(in billions of rubles)  

<table>
<thead>
<tr>
<th>Category</th>
<th>Year-end 1987</th>
<th>Year-end 1988</th>
<th>Average 1988</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Machine-building complex</td>
<td>865.0</td>
<td>904.0</td>
<td>88.5</td>
</tr>
<tr>
<td>2. Defense complex</td>
<td>111.0</td>
<td>116.0</td>
<td>113.5</td>
</tr>
<tr>
<td>3. Total MBMW</td>
<td>225.3</td>
<td>235.4</td>
<td>230.4</td>
</tr>
<tr>
<td>4. Total industry</td>
<td>845.0</td>
<td>883.0</td>
<td>864.9</td>
</tr>
</tbody>
</table>

Sources: (1.) End 1987, *Promyshlennost' SSSR*, M., 1988, p.170; end 1988: calculated on the assumption that the share of total MBMW (38.4 percent) was unchanged; (2.) End 1988: 6.4 percent of total productive capital stock of 1,608 billion rubles (*Narodnoe khozyaistvo SSSR v 1988 g.*, pp. 269); end 1987: calculated using end 1986 share of total MBMW (43.3 percent); (3.) and (4.) *Narodnoe khozyaistvo SSSR v 1988 g.*, pp. 249-250.

Thus, in 1988 the capital stock of the defense complex represented almost half the total machine-building and metal-working capital stock and 13 percent of the total industrial productive capital stock.

**LABOR FORCE**

No data have been published on the total size of the defense complex labor force. An approximate estimate can be obtained by indirect means. In 1987 the civilian machine-building complex employed 5.6 million industrial production personnel (*Promyshlennost' SSSR*, p. 170). In the same year the machine-building and metal-working industry employed a total of 16,457,000, falling to 16,167,000 in 1988 (*Narodnoe khozyaistvo SSSR v 1988 g.*, p. 366). Assuming its share of the total was unchanged, the machine-building complex's labor force was 5.5 million in 1988.

In 1988 the average value of productive capital assets per worker in the machine-building complex was 16,090 rubles. On the assumption that the defense complex assets per worker ratio is somewhat higher, say 10 percent, we obtain 17,700 rubles assets per worker. From the total capital stock of the defense complex, we obtain a labor force of 6.4 million. This represents 40 percent of the total MBMW labor force and 17 percent of the total industrial labor force.

For the machine-building complex, output per worker in 1988 can be calculated as 18,000 rubles. Taking the estimated 6.4 million labor force of the defense complex, we obtain an output per worker of 18,440 rubles, i.e., almost 2.5 percent higher than the civilian machine-building complex. These modest differentials in ratios for capital and output per worker are consistent with recent claims by Soviet authors. According to Belousov, the defense sector capital stock is not notably superior to that of civilian machine-building, while Isaev has claimed that labor productivity and the output-capital ratio correspond to levels general in the economy (*Pravda*, 28 August 1989; *Kommunist*, 1989, No. 5, p. 25).
MILITARY AND CIVILIAN PRODUCTION WITHIN THE DEFENSE COMPLEX

According to information released by the Soviet Union to the International Labor Office, in 1988 54.9 percent of the total labor force of the defense complex was employed in military production (ILO, Disarmament and Employment Program, Working Paper No. 16, p. 12. Note: no total defense industry employment figure was supplied to the ILO). Taking the total estimated defense complex labor force of 6.7 million, we obtain 3.7 million employed in military production and 3 million in civilian activities. Thus, military production employment within the defense complex represents 10 percent of total industrial employment.

As might be expected, the output per worker for military production within the defense complex is higher than for civilian production. With a 1988 military output of 72 billion rubles, output per worker is 19,460 rubles, i.e., 8 percent higher than the level in the machine-building complex. But for defense complex civilian production (46 billion rubles), output per worker is only 15,330 rubles, i.e., 15 percent lower than the level attained in the specialized civilian machine-building industry. This finding is not surprising given the known low level of specialization of some of the defense sector's civilian production.

TOTAL MILITARY PRODUCTION

Some military production is undertaken outside the defense complex, in particular the building of armored vehicles and other military transport equipment. According to the data released to the ILO, in 1988 546,000 industrial production personnel were employed in military production in civilian branches (ILO, loc. cit.). We thus obtain a total military production employment of 4.25 million, equivalent to 11.4 percent of the total industrial labor force.

Taking the average civilian machine-building complex output per worker of 18,000 rubles, the value of this additional military production can be estimated as 10 billion rubles (11 billion rubles if we take the higher productivity of “specialized” military production). Thus total 1988 military output is approximately 82 billion rubles, of which 12 percent is manufactured outside the defense complex. Military production represents 9 percent of total industrial production.

NUMBER OF ENTERPRISES

Until recently there was no information on the total number of enterprises in the Soviet defense complex and it was impossible to estimate the number with acceptable accuracy by indirect means. It is known that in early 1989 the civilian machine-building complex had approximately 2,150 enterprises (apparently all associations and enterprises on
an independent balance, the latter including those with independent status within PO and NPO) (calculated from Goskomstat, Sotsial no-ekonomicheskoe razvitie strany v yanvare-aprele 1989g.: ekonomicheskii cazor, 1989, No. 3, p. 34).

According to Gosplan first deputy chairman V. Smyslov, conversion will be undertaken at more than 400 defense enterprises, or 40 percent of their total number (Soviet News, No. 6157, 14 March 1990, p. 90). The meaning of this is unclear. It could refer to the total number of associations and enterprises of the defense complex, in which case it probably excludes enterprises of independent status within associations. A second possibility is that it refers to those enterprises of the defense complex identified as defense plants. Yet another possibility is that it refers to enterprises identified as "defense" both within and outside the defense complex. Some ministries of the defense complex (e.g., aviation and electronics) appear to have a substantial number of enterprises, probably more than 400 each. (Note, before the 1989 reorganization both the civilian electrical engineering and machine tool industry ministries had approximately 400 enterprises each). In the author's view, the figure comparable to the machine-building complex's 2,150 associations and enterprises is likely to be at least 2,500.

RESEARCH AND DEVELOPMENT

The scale of the defense industry's R&D effort has not been revealed. While the Ministry of Defense's budget expenditure on R&D is now known, it provides only a partial guide to the scale of R&D expenditure within the defense complex. The MCD figure will include R&D undertaken by the Ministry's own research establishments, and will exclude defense complex R&D funded from other sources. It is known that in 1988, 78.7 percent of the defense complex's total R&D expenditure was for military purposes (ILO, loc.cit.).
Appendix 13B
THE SHARE OF TOTAL SOVIET OUTPUT OF CIVILIAN PRODUCTS FROM ENTERPRISES OF THE DEFENSE INDUSTRY, 1988

<table>
<thead>
<tr>
<th>Product</th>
<th>Defence Industry Output</th>
<th>Percent Total Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Crude steel (m.t.)</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>2. Finished rolled steel (m.t.)</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>3. Gold</td>
<td>n.d.</td>
<td>c. 15</td>
</tr>
<tr>
<td>4. Mineral fertilizer (m.t.)</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>5. Drilling rigs (sets)</td>
<td>180</td>
<td>33</td>
</tr>
<tr>
<td>6. Turbodrills (sections)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal-cutting machine tools:</td>
<td>1,500</td>
<td>9</td>
</tr>
<tr>
<td>7. Total output (t. units)</td>
<td>(37)</td>
<td>(25)</td>
</tr>
<tr>
<td>8. NC machine tools (units)</td>
<td>(4,000)</td>
<td>(18)</td>
</tr>
<tr>
<td>9. inc. machining centers</td>
<td>(1,200)</td>
<td>(32)</td>
</tr>
<tr>
<td>10. NC control units</td>
<td>10,200</td>
<td>46</td>
</tr>
<tr>
<td>11. Bearings (m. units)</td>
<td>91</td>
<td>8</td>
</tr>
<tr>
<td>12. Computing technology (m.r.)</td>
<td>4,650</td>
<td>71</td>
</tr>
<tr>
<td>13. inc. personal computers (u.)</td>
<td>112,600</td>
<td>94</td>
</tr>
<tr>
<td>14. Medical technology (m.r.)</td>
<td>(215)</td>
<td>(22)</td>
</tr>
<tr>
<td>15. Tractors (t. units)</td>
<td>83</td>
<td>15</td>
</tr>
<tr>
<td>16. Agricultural machinery (m.r.)</td>
<td>(440)</td>
<td>(11)</td>
</tr>
<tr>
<td>17. Food industry equipment (m.r.)</td>
<td>c. 1,000</td>
<td>77</td>
</tr>
<tr>
<td>18. Excavators (units)</td>
<td>4,840</td>
<td>12</td>
</tr>
<tr>
<td>19. Passenger cars (t. units)</td>
<td>130</td>
<td>10</td>
</tr>
<tr>
<td>20. Motorcycles &amp; scooters (t. units)</td>
<td>601</td>
<td>56</td>
</tr>
<tr>
<td>21. Bicycles (t. units)</td>
<td>3,176</td>
<td>56</td>
</tr>
<tr>
<td>22. Refrigerators (t. units)</td>
<td>6,045</td>
<td>97</td>
</tr>
<tr>
<td>23. Washing machines (t. units)</td>
<td>4,239</td>
<td>69</td>
</tr>
<tr>
<td>24. Vacuum cleaners (t. units)</td>
<td>3,722</td>
<td>78</td>
</tr>
<tr>
<td>25. Television sets (t. units)</td>
<td>9,637</td>
<td>100</td>
</tr>
<tr>
<td>26. Radios (t. units)</td>
<td>8,025</td>
<td>100</td>
</tr>
<tr>
<td>27. Tape- recorders (t. units)</td>
<td>5,406</td>
<td>98</td>
</tr>
</tbody>
</table>
### Appendix 13B

(Cont'd)

<table>
<thead>
<tr>
<th>Product</th>
<th>Defence Industry Output</th>
<th>Percent Total Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>28. Video-recorders (t. units)</td>
<td>73</td>
<td>100</td>
</tr>
<tr>
<td>29. Sewing machines (t. units)</td>
<td>1,550</td>
<td>100</td>
</tr>
<tr>
<td>30. Clocks and watches (m. units)</td>
<td>16</td>
<td>22</td>
</tr>
<tr>
<td>31. Cameras (t. units)</td>
<td>2,722</td>
<td>100</td>
</tr>
<tr>
<td>32. Furniture (m.n.) (4 ministries)</td>
<td>264</td>
<td>3</td>
</tr>
<tr>
<td>33. Consumer goods (m.n.)</td>
<td>26.6</td>
<td>23</td>
</tr>
</tbody>
</table>

**NOTE:** This represents an updating and extension of the author's earlier work, "The Scale of Output of Civilian Products by Enterprises of the Soviet Defense Industry," CREES Discussion Papers, SITPS, No. 5, August 1986. The methodology employed here is similar to that of the earlier work, to which reference should be made. In some cases it has been necessary to make a somewhat arbitrary assessment of the share of the defense sector in an identified residual output; this is intended to provide an approximate indication only.

**SOURCES:**


2. As 1.

3. The (former) Ministry of Medium Machine-building produces up to 15 percent of gold output. It is assumed that it is the sole defense sector producer. (BBC, SWB, SU0503 C/2, 8 July 1986).


5. Total output: Narikhlo 88, p. 332; Output of Ministry of Heavy Machine-building: SPB, 1989, No. 2, p. 19. It is assumed that the residual is the production of the Ministry of Defense Industry (MOP), known to be a manufacturer of drilling rigs.


7. Total output (148,000): Narikhlo 88, p. 389; output of Ministry of the Machine Tool Industry (Minskotprom) (104,000): SPB, 1989, No. 2, p. 24. It is assumed that other civilian producers account for 5 percent of total output, the residual being that of the defense industry.

8. Total output (32,000): Narikhlo 88, p. 389; MSIP output (17,000): SPB, 1989, No. 2, p. 24. It is assumed that 500 NC machines are built by enterprises of other civilian ministries.


10. Total output: SPB, 1989, No. 4, p. 117; Minprimor output: SPB, 1989, No. 2, p. 26. The remaining output is believed to be that of the defense industry, but it is possible that some units are manufactured by the electrical engineering industry.

11. Total output: Narikhlo 88, p. 392; Output of Ministry of Automobile Industry (Minskotprom): SPB, 1989, No. 2, p. 27. It is assumed that the residual output is that of the defense industry, probably the aviation and missile industries.


14. Total output: Sf, 22 January 1989; Output of Minavtoprom (633 m.r.): SPB, 1989, No. 2, p. 25. It is assumed that the defense sector produces 60 percent of the residual output. Note: 1989 planned defense sector output of medical equipment—240 m.r. (Pravda, 8 June 1989).

15. Total output: Narboz 88, p. 304; Output of Ministry of Agricultural Machine-building: SPB, 1989, No. 2, p. 28. All the residual is known to be the output of MOP and the Ministry of General Machine-building (MOM).

16. Sources as 13. It is assumed that the defense sector accounts for half the residual output.


18. Total output: Narboz 88, p. 394; Output of Ministry of Construction and Road Machine-building (36.4) and Ministry of Heavy Machine-building (0.5): SPB, 1989, No. 2, pp. 20 and 29. The residual output is assumed to be that of the defense industry, in which the former Ministry of Machine-building (MM) was a known producer.


22. Use of sources as 20 gives almost 100 percent, known to be too high as refrigerators are built by Minavtoprom. A share of 95 percent is given in Kommercheski Vestnik, 1990, No. 3, p. 40.

23. As 20.


25. As 20.


27. As 20 and Argumenty i Fakty, 1989, No. 12, p. 4.

28. As 20. The Ministry of the Electronics Industry (MEE) is the sole producer of domestic video-recorders.

29. Argumenty i Fakty, 1989, No. 12, p. 4. MOP has taken over as the sole producer of domestic sewing machines, the Podols'k Podols'kikhvemash' association.


31. Narboz 88, p. 411. Cameras are produced only by enterprises of MOP and the aviation industry.


33. VS, 1989, No. 5, pp. 71-73. Total output refers to non-food consumer goods other than those produced by the Ministry of Light Industry.
Appendix 13C
THE PLANNED SCALE OF SOVIET DEFENSE INDUSTRY CONVERSION

From the fragments of evidence now available it is possible to establish very provisionally the envisaged scale of conversion during the period 1988 to 1995. Since the original announcement of conversion, the position has been complicated by the administrative changes of the summer of 1989. These changes have altered the composition of the defense “complex” and have also involved some additional transfers to it of civilian capacity. In the following, Soviet data are taken at their face value, without consideration of the realism of the prices employed.

The original intention was to change the proportions of gross output of the defense complex as shown in Table 13C.1:

<table>
<thead>
<tr>
<th>Year</th>
<th>Military</th>
<th>Civilian</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>1990</td>
<td>54</td>
<td>46</td>
</tr>
<tr>
<td>1991</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>1995</td>
<td>40</td>
<td>60</td>
</tr>
</tbody>
</table>


The output of the two components was planned to change as shown in Table 13C.2:

<table>
<thead>
<tr>
<th>Year</th>
<th>% change</th>
<th>Military</th>
<th>Civilian</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>5.5</td>
<td>100.0</td>
<td>5.7</td>
</tr>
<tr>
<td>1989</td>
<td>-4.5</td>
<td>95.5</td>
<td>8.9</td>
</tr>
<tr>
<td>1990</td>
<td>-4.7</td>
<td>91.0</td>
<td>13.2</td>
</tr>
</tbody>
</table>


It is reasonable to assume that the 12th five-year-plan envisaged an annual average rate of growth of approximately 5.5 percent. According to L. Vid, prior to conversion the
production of armaments and other military equipment increased at an annual rate of 5.0-5.5 percent (Bulletin of the Atomic Scientists, Jan./Feb., 1990, p. 19). The unilateral military cutback announced at the end of 1988 involves a 19.5 percent reduction of output of armaments and military equipment compared with the original intention of the five-year-plan. (This interpretation of the cut is now being presented in Soviet sources: see, e.g., Krasnaya Zvezda, 1 March 1990; Novoe Vremya, 1990, No. 10, p. 30). Taking 5.5 percent, it can be calculated that the 1990 planned military output after conversion is 18.2 percent smaller than originally intended in the five-year-plan. The difference between this and 19.5 percent probably can be explained by the fact that some military equipment is also produced outside the defense complex, and it is likely that a somewhat faster rate of reduction of output was planned for this component given that much of it takes the form of military transport equipment with much shorter lead times than many of the weapon systems built by the defense complex.

In the course of 1989 and early 1990 the planned proportions of output of the defense complex were amended presumably to take account of transfers of capacity and administrative changes. Late in 1989 it was claimed that the expected share of civilian output of the defense complex in that year would be 43 percent (Moskovskaya Pravda, 24 October 1989 and Pravda, 27 November 1989 (L. N. Zaikov)), while the plan for 1990 provides for a civilian share of almost half (49.2 percent) (Sotsialisticheskaya Industriya, 7 October 1990. Note: this source gives a 1989 share of 41 percent)—a year earlier than originally planned. There is no doubt that this change is entirely a result of transfers of capacity, and not because of more-rapid-than-planned conversion. The 1990 plan now provides for a rate of growth of defense complex civilian output of 14 percent (BBC, SWB, SU/0603 C/3, 2 November 1989).

In December 1989, Ryzhkov revealed that compared with 1989 the total output of the defense complex was planned to grow by 45 percent by 1995, and of the civilian component by 82 percent. In 1995 it was envisaged that the civilian share would exceed 60 percent (Pravda, 14 December 1989). It is likely that these growth rates were based on the 1989 planned civilian output, which was probably not achieved.

At the end of February 1990 the first details of the draft state program of conversion to 1995 were published. During the seven years from 1988 the total volume of civilian production of the defense complex is to double and in 1995 will exceed 110 billion rubles. It is also claimed that the share of defense complex conversion during 1990-91 will be 14 percent, but the meaning of this is unclear (Izvestiya, 28 February 1990).
From all the above evidence it is possible to assemble the following, indicating intentions for conversion both before and after the changes of 1989 (Table 13C.3):

**Table 13C.3**

**Plans for the Partial Conversion of the Defense Complex**
(output in billions of rubles)

<table>
<thead>
<tr>
<th>Year</th>
<th>Civilian A</th>
<th>Civilian B</th>
<th>Military A</th>
<th>Military B</th>
<th>Total Output A</th>
<th>Total Output B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>46</td>
<td>40</td>
<td>72</td>
<td>60</td>
<td>118</td>
<td></td>
</tr>
<tr>
<td>1989</td>
<td>50</td>
<td>41</td>
<td>69</td>
<td>59</td>
<td>119</td>
<td>124</td>
</tr>
<tr>
<td>1990</td>
<td>55</td>
<td>46</td>
<td>66</td>
<td>54</td>
<td>122</td>
<td>128</td>
</tr>
<tr>
<td>1991</td>
<td>63</td>
<td>50</td>
<td>63</td>
<td>50</td>
<td>126</td>
<td>124</td>
</tr>
<tr>
<td>1995</td>
<td>106</td>
<td>60</td>
<td>110+</td>
<td>61+</td>
<td>176</td>
<td>180</td>
</tr>
</tbody>
</table>


Table 13C.3 has been constructed on the basis of the 110+ civilian output in 1995, double the level of 1989, and the claimed 45 percent increase in total output, 1989-95. For 1991, the same rates of growth of civilian production as for 1990 have been assumed. It has also been assumed that the intentions for military output have not been altered as a result of changes in 1989, but this may not be so: the output of the nuclear weapons industry may now be excluded from the output of the defense complex. (In 1989 the Ministry of Defense spent 2.3 billion rubles on financing the production and procurement of nuclear devices; reduced to 1.3 billion rubles in the budget for 1990 (Krasnaya Zvezda, 1 February 1990)). The B series civilian share in 1989, 44 percent, turns out to be somewhat higher than the 43 percent claimed by Zaikov.

From Table 13C.3, it can be concluded that during 1991-95 it is intended that the output of weapons and other military equipment shall rise at an annual rate of 2.5 percent. This could represent stable real output, with a modest allowance for rising prices.

Compared with 1989, the additional civilian output, 1990-91 of 16 billion rubles, represents 13 percent of 1989 total defense industry output. This could explain the claimed 14 percent "share" of conversion during 1990-91.

Indirect confirmation is provided by some additional evidence on the scale of output of the weapons industry. According to a statement of Belousov in June 1989, the output of the defense industry is equivalent to just over 8 percent of GNP (BBC, SWB, SU/0497 C/2, 1 July 1989). Taking 1988, GNP was 875 billion rubles, 8.2 percent of which gives 72 billion rubles, i.e., the same as the military component identified above for that year. Given that it is the practice in the Soviet Union to discuss industrial output almost exclusively in gross terms, it
is reasonable to assume that Belousov was in fact referring to the gross output of the military component of the defense complex.

Assuming the above provides an approximately accurate indication of intentions, it is possible to estimate the potential gains from partial conversion in terms of the scale of additional civilian goods production (Table 13C.4):

<table>
<thead>
<tr>
<th>Year</th>
<th>Civilian</th>
<th>Military</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
<td>II</td>
<td>I-II</td>
</tr>
<tr>
<td>1986</td>
<td>37</td>
<td>37</td>
<td>-</td>
</tr>
<tr>
<td>1987</td>
<td>39</td>
<td>39</td>
<td>-</td>
</tr>
<tr>
<td>1988</td>
<td>42</td>
<td>46</td>
<td>4</td>
</tr>
<tr>
<td>1989</td>
<td>45</td>
<td>55</td>
<td>10</td>
</tr>
<tr>
<td>1990</td>
<td>47</td>
<td>62</td>
<td>15</td>
</tr>
<tr>
<td>FYP</td>
<td>272</td>
<td>289</td>
<td>27</td>
</tr>
<tr>
<td>1991</td>
<td>49</td>
<td>71</td>
<td>22</td>
</tr>
<tr>
<td>1992</td>
<td>62</td>
<td>79</td>
<td>27</td>
</tr>
<tr>
<td>1993</td>
<td>54</td>
<td>88</td>
<td>34</td>
</tr>
<tr>
<td>1994</td>
<td>57</td>
<td>98</td>
<td>41</td>
</tr>
<tr>
<td>1995</td>
<td>60</td>
<td>110</td>
<td>50</td>
</tr>
<tr>
<td>FYP</td>
<td>272</td>
<td>446</td>
<td>174</td>
</tr>
</tbody>
</table>

**NOTES:** Actual for 1986-1989, planned for 1990-1995; I = without conversion/transfers of capacity, II = with conversion/transfers of capacity.

Series I for civilian output is based on an assumed annual growth of output of 5.5 percent during 1986-90 and 5 percent during 1991-95. Note that in 1988 civilian output was increased by the transfer of enterprises from the disbanded Ministry of Machine-building for the Light and Food Industries. Here it is assumed that approximately 5 billion rubles of output was transferred. (In 1984 the output of the ministry was approximately 4.1 billion rubles—Planovoe khozyaystvo, 1986, No. 3, p. 88).

Series I for military output is based on an assumed 5.5 percent annual growth during 1986-90, and for 1991-95, 5 percent.

From Table 13C.4 it can be seen that the new policy will give an additional 27 billion rubles of civilian production during the current five-year-plan, mainly from transfers of capacity rather than conversion, and 174 billion rubles during 1991-95. In 1995 the gain from conversion and capacity transfers amounts to 50 billion rubles, representing an addition to total civilian industrial output of approximately 5 percent (obtained by projecting forward the 1989 industrial output at an annual average rate of 4 percent, giving a total of 1150 billion rubles, from which is subtracted a total military output of approximately 80 billion.
rubles (with account of military production outside the defense complex—see below). The military output of the defense complex in 1995 will be some 30 percent less than it might have been without a conversion policy. Total military output as a share of total industrial output falls from approximately 9 percent in 1989 to 7 percent in 1995.

The above makes possible some retrospective analysis. Projecting the civilian and military components back to 1985 at the same assumed rates of growth gives a total defense complex output of 97 billion rubles, including military 62 billion rubles, giving civil/military shares of 36/64. In the same year the output of the machine-building complex was approximately 82 billion rubles (estimated from Promyshlennost SSSR, M., 1988, pp. 170 and 16). The defense complex’s military output thus represented 36 percent of the combined output of both complexes. But according to Ligachev, in 1985 military production accounted for almost 40 percent of the total (Prauda, 21 July 1989). The difference must be the military output of the civilian machine-building complex, amounting to some 9 billion rubles, or 13 percent of total military output (11 percent of the output of the machine-building complex). In the author’s view these are entirely plausible proportions. It is also possible to calculate an approximate volume of defense industry civilian production during the 1981-85 five-year-plan. According to Zaikov, the planned increase in civilian production during the 12th five-year-plan, compared with the 11th, was 41 percent (Moskovskaya Prauda, 24 October 1989). Taking the original planned total output of 212 billion rubles, estimated above, we obtain an 11th five-year-plan period total civilian output of 150 billions rubles giving an average of 30 billion rubles per year.
Appendix 13D

PLANNED DEFENSE INDUSTRY CIVILIAN OUTPUT DURING 1991-95

Draft plans for the 13th five-year-plan, 1991-95, are now emerging for the expansion of output of specific civilian goods produced by enterprises of the defense complex. The following summarizes the available information. Unless indicated, the targets refer to the growth of total output during 1991-95 compared with total output for the 12th five-year-plan.

Civil Aircraft: 2.5 times the level of deliveries during the 12th first-year-plan (Izv., 28 February 1990). Note: planned output may have been raised—in July 1989 it was claimed that deliveries would more than double (Kr.Zv., 26 July 1989). Another source gives an even higher rate: production will grow at an annual average of 28 percent, compared with the 5 percent usual in the past (Mask. Pravda, 24 October 1989). The 1990 plan provided for a growth of civil output for Aeroflot of more than 20 percent (Ekon. Gaz., 1989, No. 21, p. 15).

Civil Shipbuilding: output to increase 1.5 times (Kr.Zv., 26 July 1989).

Communications Equipment: output to increase by 80 percent (Mask. Pravda, 24 October 1989).

Computer Technology: output to increase 2.1 times, including personal computers 3.8 times (Izv., 28 February 1990).

Electronics Industry: output to double (Mask. Pravda, 24 October 1989). Note, this source gives an increase of output of personal computers of 5 times.

Equipment for the Agro-industrial Complex: output to increase 2.2 times, totalling 11 billion rubles over five years (Izv., 28 February 1990). Note: in this case the planned output appears to have been reduced. The original intention was for the defense complex to produce 17.5 billion rubles of equipment during 1988-95 (Izv., 2 January 1989).

Equipment for Light Industry: output to total 10 billion rubles over five years (Izv., 28 February 1990).

Equipment for Trade and Public Catering: output to total c. 5 billion rubles over five years (Izv., 28 February 1990).

Medical Equipment: output to increase 2.3 times (Izv., 28 February 1990).

Appendix 13E
EVIDENCE ON CUTBACKS IN THE PRODUCTION
OF MILITARY EQUIPMENT

To date little has been revealed on the planned reductions of output of specific types of
armaments and military equipment, and the evidence that has appeared has often been
presented in such a manner as to conceal the true scale of the cutbacks. The following
summarizes available information.

Aircraft

Number of aircraft planned to be procured by the Air Force in 1990 reduced by 23
percent as compared to 1989, and 30 percent compared to 1988. In value terms these
reductions are 12 and 14 percent respectively (Kr. Zv., 22 February 1990).

In 1990 deliveries of combat aircraft to be reduced by 12 percent and of military
helicopters by 60 percent as compared to the original targets of the five-year-plan (Pravda,
26 September 1989 and Bulletin of the Atomic Scientists, 1990, Jan./Feb., p. 19 (L. Vid,
deputy chairman of Gosplan, who is explicit that the reductions relate to the five-year-plan).

Tanks

In 1990 deliveries of tanks will be reduced by 52 percent compared to five-year-plan
target (Pravda, 26 September 1989).

By the end of 1990 tank production to be reduced by more than 40 percent (BBC, SWB,
SU/0552 C/3, 4 September 1989).

Munitions

In 1990 deliveries to be reduced by 20 percent as compared to the original five-year-
plan target (Pravda, 26 September 1989 and Bulletin of the Atomic Scientists, 1990,
Jan./Feb., p. 19).
14. THE CONVERSION OF SOVIET DEFENSE INDUSTRY

Arthur J. Alexander

ASPECTS OF SOVIET MILITARY AND CIVILIAN INDUSTRY

Seeking the "Magic of the Defense Sector"

Soviet defense industry is different from civilian industry. Believing that such differences have been the major source of the relative success of defense production and that these differences are transferable from the defense to the civilian sector, Soviet leaders for the past 25 years have attempted to seize a small part of the "defense industry magic" and bestow it on civilian industry through the transfer of defense managers and methods. Such attempts were accelerated in the early Gorbachev years in the first phase of enlisting the defense sector in the aid of the economy.\(^1\) Gorbachev transferred defense industry managers to the civil production sector, imitated the coordinating and executive functions of the Military Industrial Commission (VPK) by establishing similar commissions for the machine-building and agroindustrial sectors, and tried to duplicate the clout of a buyer's market as exercised by the Ministry of Defense and its military representatives by establishing a civilian counterpart in the State Acceptance Commission (Gospriemka).\(^2\) Unfortunately, none of the magic that seemed to inhere in defense production has been captured in these hapless imitative ventures.

Because the magic could not be transferred out of the defense production sphere, Soviet leaders seem to have concluded that civilian production within the defense complex would be touched by the elusive qualities. We have consequently witnessed since early 1988 the acceleration of efforts to increase the civilian output of defense industry. This new policy marks a break with past efforts to harness defense industry to civilian output: it

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\(^1\)These periods, from 1985 until mid-1987, and to the present, were almost certainly not planned as a phased program by the Soviet leadership, but rather grew out of major changes in perceptions and politics that, in retrospect, we can identify with different phases. For an analysis of the "first phase," see Arthur J. Alexander, "Soviet Weapons Acquisition in the Age of Perestroika," in Henry Rowen and Charles Wolf, Jr., The Impoverished Superpower: Perestroika and the Soviet Military Burden, Institute of Contemporary Studies Press, San Francisco, 1990. The political struggle is analyzed by Harry Gelman The Soviet Turn Toward Conventional Force Reduction: The Internal Struggle and the Variables at Play, R-3878-AF, RAND, 1989.

encompasses the application of defense resources as well as its magic. The second phase of the evolving policy is the conversion of defense industry capacity to civilian purposes.

**Priority in the Soviet Economy**

Within the Soviet system of a planned economy, civilian industry suffers on two counts: (1) the political authorities allocate a comparatively large volume of resources, especially of more advanced materials and supplies, to defense, thus leaving civilian production relatively starved; and (2) unrealistically high output targets (taut plans) result in shortfalls of planned inputs, creating a seller's market and great uncertainty in civilian production, that the defense industry alleviates through special access to authority and to supplies.

These two methods of transforming preferences into results can be termed "allocational priority" and "implementation priority." Allocational priority exists when a particular sector or recipient is favored in comparison to the sectoral share or level of resources received by other sectors of the economy.

Implementation priority can arise whenever allocations are insufficient by themselves to accomplish desired objectives. In the bureaucratic, planned, shortage-dominated economy of the Soviet Union, implementation priority is a customary method by which political preferences are realized. Defense is an example of the coming together of rhetorical, allocational, and implementation priority in the Soviet Union—the alliance of word, ruble, and deed. The necessary complement to such priority is the low status of civilian industry, and its consequences: neglected material base, low technological levels, insufficient output, and poor quality products.

**Military Industry's Access to Supplies**

Military industry has customarily been given first priority in its access to materials and the outputs of other enterprises. Beginning with planning at the highest level, the military allocation (as determined by the interplay of politics, economics, and military demands) is satisfied first, with the rest of the economy treated as a residual.\(^3\) At enterprises, military orders must be completed before the demands for other customers. Capital equipment in short supply goes first to military plants, and then the remainder is allocated to lower priority enterprises. Advanced, high-productivity foreign equipment flows to military producers. Not only supplies and equipment, but also high-quality workers and

managers have been channeled to the military-industrial sector, where they have been rewarded with high salaries, bonuses, and other perquisites such as housing.

In order to guarantee the quality of its inputs, the military itself manages a network of military representatives at production plants producing final goods or inputs for the military customer. These representatives have the responsibility and authority to reject output that does not meet the contractual specifications and to work out corrective procedures with local managers.

Even more than in civilian industry, the military industrial ministries and factories try to assure that as many of its supplies and inputs are produced under its control as possible. For example, the Ministry of Aviation Industry includes aluminum production capabilities and rubber plants for tire production.

In short, military producers escape many of the effects of a seller's market. They insist on the meeting of agreed quantities, qualities, and schedules. And they have the advantage of planning priority, delivery authority, and independent on-the-scene inspection by authoritative experts to implement their demands.

Party and government organs contribute to the reduction of supply uncertainties to military industry. Local Party secretaries, as part of their general function of obtaining supplies for enterprises under their jurisdictions, pay special attention to military production. They can divert needed supplies from civilian plants to military plants, comb the local areas for reserves, and call on their comrades in other areas to do the same in exchange for commodity trades or future favors. Local Party leaders can use political pressure on producers to speed up production to meet deadlines, find transport equipment to move available goods, and otherwise attempt to solve the thousands of bottleneck problems that afflict Soviet industry. Some analysts claim that these functions legitimize the roles of local Party leaders, impeding reforms that would eliminate these functions and therefore the local Party’s status and main raison d’être.

When solutions to supply problems cannot be dealt with on the local level, officials can ascend the Party hierarchy, seeking resolution at higher levels. At the top, the Party Secretary overseeing the Defense Industry Department of the Central Committee can call on the entire national economy to solve a critical military industrial supply problem, mobilizing the planning and supply agencies, industrial capabilities, and stocks and reserves. The Party, therefore, both establishes the priority of the military sector, and in its deployed capacity throughout the country, stands ready to help implement its own policy.

The Party is aided in this task by an agency that is nominally attached to the Council of Ministers, but that is closely supervised by the Party Secretary for Defense Industry: the
Military-Industrial Commission (VPK). The VPK is primarily an implementing organization of military-industrial policy rather than one that originates policy. One of its primary jobs is to coordinate and police military priorities throughout the economy and to see that decisions are actually carried out. The VPK participates in planning of weapons R&D and procurement at the national level with Gosplan,4 the Academy of Sciences, and the State Committee for Science and Technology (GKNT). With a supra-ministerial role and commensurate authority, its instructors have the knowledge, skill, and power to ensure compliance with contracts and program plans; apparently, they are not reluctant to use these powers, even if fulfilling military demands has adverse consequences for lower-priority users.

The Political Sources of Military Industry Effectiveness

The effectiveness of Soviet weapons acquisition has depended on the granting of special rights and privileges to the defense establishment by the political leaders. Effectiveness therefore largely flows from political decisions and choices. The special rights granted to Soviet defense include the following. (1) The privilege of the customer—the Ministry of Defense—to be a demanding buyer. It can expect contracts to be honored; it can enforce performance; it can refuse to accept defective products. (2) The privilege of defense industry to receive priority in the planning and delivery of materials and supplies. It is assigned the best managers; it has been able to attract top technical specialists; in a shortage economy, it is afforded first access to supplies. (3) The defense effort has been given the right to the large volume of resources needed to meet military requirements. These three rights granted by the political leadership to the nation’s defense have permitted defense managers to operate with greater flexibility and less uncertainty than managers in the civil sector. Although the Soviet economic system and decisionmaking practices impose considerable caution and conservation on defense industry managers and designers, they have sufficient assurances of material support to develop and use confidently new technology in military equipment.

Can these political sources of effectiveness be transferred to civilian industry? Over the years, Western analysts have prescribed several methods to increase the effectiveness of the Soviet civilian economy, including: (1) reform of the economic system, bringing it more in line with Western capitalist economies to obtain greater output from available resources; (2) reallocation of resources from defense to civilian uses; and (3), in the absence of economic

4The chronicle of events in the Council of Ministers, for example, noted a joint presentation by Gosplan and the VPK on the draft plan of the defense complex for the coming year. “Chronicle, in the Presidium of the Council of Ministers of the USSR,” Pravitelstvenny Vestnik, No. 16, September 1989, p. 3.
reform, shift of implementation priority of supply in the tautly planned economy from
defense to civilian production. Economic reform, so far, is largely a stillborn policy under
Gorbachev’s perestroika. The policy of conversion has already incorporated a good deal of
resource reallocation. Preliminary evidence indicates at least a partial shift in
implementation priority, although the actual persistence and consequences of such a shift
will have to be carefully monitored to assess the longer term effects. Underscoring the shift
in priorities, Prime Minister Ryzhkov in June 1989 told the Supreme Soviet that the main
value impressed upon defense production ministers was the “exceptional importance of
measures aimed at conversion of defense production facilities and their redesignation to the
production of consumer goods, alongside the need to equip the USSR Armed Forces.”5 Thus,
the Soviet leadership has embarked on at least one and a half new policies. A fundamental
feature of conversion is that is now reflects political changes that deviate from the Stalinist
value system embedded in past practice and institutions.

Military Industry Governance

Civilian production in defense industry has not been granted the full implementation
priority of defense, as defense production managers have been sadly reminded when they are
forced to confront the vagaries of the civilian supply system. But even though civilian output
does not carry the legal stamp of priority, it is often the high-level attention to the problems
and processes of production that matters. In this sense, there appears to be a transfer of
priority to civilian matters. How long will this last? Because it flows from political power
and administrative methods, the political pressure must be maintained—and
institutionalized.

The VPK chairman has become a leading public spokesman for the conversion to
civilian output, and individual ministers have taken personal responsibility for meeting
planned civilian outputs in their own spheres of influence. If this effort has captured the
time, concentration, abilities, and energies of top industrial leaders, then defense production
must have less of these scarce resources. Without the customary political backing, defense
industry will operate at closer to the levels of effectiveness exhibited by civilian industry.

With the continued planned and centralized orientation of the Soviet economy, the
formal reduction of military implementation priority—were it to occur—would require a
rooting out of decades of practice and habit. If, for example, aluminum sheet were in short
supply, it would more probably end up at a toaster factory than at a MiG plant. It would

5“Report by N. I. Ryzhkov, Chairman of the USSR Council of Ministers,” Pravda, June 28, 1989,
require that countless thousands of daily decisions, reinforced by fifty years of habit and experience, be reshaped according to new priorities. In order to be effective, such a change in values and policies would require a massive mobilization campaign, wholesale removal of old cadres and appointment of replacements, and visible punishments and rewards to emphasize that the desired performance, on which incentives are based, had indeed changed.

A new feature in Soviet politics that changes the balance of forces affecting the resource and implementation priority of defense is the process of democratization and the emergence of an independent public opinion as voiced through the press, through elections, and through the legislative organs of the Supreme Soviet and Congress of People’s Deputies. Initiated by Gorbachev’s political reforms, popular preferences and priorities now play a more important role in establishing the policies of the political leadership. A strident newspaper article examining the response of the “competent authorities” to shortages of consumer goods noted, “the opinion of the public has been molded and cannot but affect (and has indeed affected!) the subsequent actions of these authorities.”6 Indeed, the focus of defense industry on food-processing equipment and consumer goods directly reflects such political attention to popular concerns. Therefore, the fate of conversion is closely linked with the fate of political reform.

A standing committee on military affairs has also been established in the new Supreme Soviet—a move that several Party leaders, including Foreign Minister Shevardnadze, had been promoting for several years. The chairman of this committee, V. Lapygin, has declared that it will consider the most important issues “starting from the strategy of arming and providing for defense . . . to producing and manufacturing this equipment.”7 By 1989, the committee was focusing on budgetary issues, having been advised of the importance of controlling the purse by members of the U.S. House Armed Services Committee. Committee members, however, complained of the lack of specificity of budgetary formulations and stated that they had many questions for the general staff and Defense Ministry.8 This approach is another step in breaking down the monopoly over information and expertise formerly held by the professional military and is a major step in transferring stewardship of the defense complex to a broadly based civilian body.

The creation of the Supreme Soviet defense committee and the additional tasks of conversion placed on party cadres may have diffused the focus that party personnel were

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formerly able to bring to defense production affairs: not only has another high-powered body now taken responsibility for what had been a central party concern, but those concerns themselves no longer hold undisputed top priority. These factors evidently have begun to affect party performance in the defense industry sphere. Politburo member L. N. Zaikov complained to a conference on defense conversion in the capital region of "a decline in the attention devoted to the work of defense complex enterprises by rayon party committees, ministries' party committees, and the gorkom defense department." He warned party activists that the view embodied in the assertion, "given the division of functions, this is not the party's concern," was "a dangerous illusion." It thus appears that the major political, organizational, and policy shifts of recent years are beginning to be reflected at the working level of party organizations, and that the undisputed attention to defense is now waning.

Effectiveness and Efficiency

When analyzing the sources of defense industry "magic," notions of "effectiveness" and "efficiency" should be clearly separated. Broadly speaking, Soviet weapons development and production have been effective in an international, military context. But according to a growing volume of evidence, the efficiency of Soviet defense R&D and production is questionable, especially for the more technologically advanced and complex types of equipment.

Anecdotal evidence describes many of the same processes in defense establishments that degrade efficiency in civilian enterprises, and for the same reasons. In comparison to U.S. practice, Soviet efficiency in producing contemporary, technologically advanced military hardware is especially low. Recent intelligence analyses suggest that the resource cost of Soviet weapons procurement has doubled in the past decade, whereas the cost, if produced in the United States, would have grown by only about 15 percent. "They are at best slightly less productive in manufacturing trucks and ships but grossly inefficient compared to the U.S. in producing high-tech guidance systems."  

This inefficiency of the Soviet defense production sector may not be fully apparent to Soviet planners and leaders because the full cost of output is not always reflected in the prices that the defense ministry pays for its products. However, as profit-oriented economic accounting principles, or khazarphet, are introduced into defense plants, and we are finding

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10Ibid.
increasing numbers of complaints from enterprise managers that they cannot generate profits under the existing pricing practices where monopsonist-established prices do not cover the costs of production.

CONVERSION POLICY

A Conversion Chronology

Conversion of defense industry capacity to civilian purposes has been the subject of several different economic plans—and the number appears to be growing. Soviet discussions of these plans often merge them into the general category of "conversion."

Plans for the use of defense capacity have been developed for: (1) processing equipment for the agroindustrial complex; (2) equipment for light industry; and (3) complex goods for consumers. A plan for medical equipment may also have been formulated, since defense industry has been charged with increased production of such goods. Additionally, a more comprehensive plan has been inspired by the projected reduction in procurement of defense equipment; this last plan may attempt to consolidate the various accumulating demands on the defense production sector and match them with the capacity that will be freed by declining military demand.

To help clarify the evolution of the policies on conversion, the following chronology attempts to array the evolution of various events. An October 1987 Central Committee conference on the food processing sector of the agroindustrial complex led to the subsequent development of a comprehensive plan, which included defense industry, for increasing output in the 1988-95 period. Apparently as a consequence of the decisions taken at this time, the Ministry of Machine Building for Light and Food Industry and Household Appliances (Minlegpishchemash) was disbanded on March 1, 1988, and 220 plants transferred to defense industry ministries, although the decision had apparently already been made the previous November. The Party secretary of the disbanded ministry realized that something was afoot as early as November 1987. "When they telephoned me back in November and said that it was not expedient to hold a Party meeting on problems associated with restructuring in our

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12VPK Chairman Belousov has spoken of ten troubled areas to which defense industry resources will be applied: (1) agricultural processing equipment; (2) light industry equipment; (3) equipment for trade and catering; (4) consumer goods; (5) electronics; (6) computers; (7) medical equipment; (8) communications; (9) civil aviation; (1) sea transport and fisheries. Remarks by Igor Belousov, Moscow Domestic Radio Service, June 28, 1989 (FBIS-SOV-89-124, June 29, 1989, p. 37).


14"Aiming for a Breakthrough," Sovetskaya Rossiya, February 28, 1988, p. 3 (FBIS-SOV-88-041, March 2, 1988, pp. 61-65). The disbanded ministry possessed 260 factories, but only 220 have figured in the transfer. The other forty may have ceased activities.
branch, I realized that some decision was being prepared with respect to our ministry."\textsuperscript{15} The deputy minister of the Ministry of Defense Industry confirmed this chronology: "The decision on the transfer of civilian enterprises turning out agricultural products processing equipment was adopted late in 1987. . . . Resources were promptly allocated from the ministry's [of Defense Industry] reserves."\textsuperscript{16} By mid-March, the Ministry of Radio Industry had established a ministerial review body to coordinate the transfer of Minlegpishchemash plants and the increased output of civilian goods.\textsuperscript{17}

In early February 1988, VPK Chairman and long-time defense industry manager Yu. D. Maslyukov had been appointed to head the state planning agency, Gosplan. This appointment was consistent with the trend of transferring defense managers to civilian jobs, but it also may have been influenced by the intention to increase involvement of defense industry to broader economic affairs.

The Council of Ministers published a package of resolutions dealing with increased output of civilian goods in August 1988. One resolution, in particular, provided instructions to defense industry ministries to increase production of specified consumer products.\textsuperscript{18} This resolution was followed up in October 1988 with a decree on measures to raise the incentives to enterprises in defense industry and heavy industry to expand consumer output.\textsuperscript{19}

The regional press mentioned in October 1988 and VPK chairman I. S. Belousov confirmed in January 1989 the existence of a comprehensive targeted program for the agroindustrial processing industry, including the participation of defense plants.\textsuperscript{20} These plans included a rigid schedule and assignments of product types and volumes to specific ministries.\textsuperscript{21}

Then, at the United Nations in December 1988, Gorbachev announced dramatic reductions in the size of Soviet forces, followed up a month later with disclosures of a 14.2 percent reduction in military expenditures, including a 19.5 percent cut in arms and military equipment procurement. Deputy Defense Minister for Armaments, General B. Shabanov,


noted in early January 1989 that the announced cutbacks were already being implemented. By February Belousov referred to the elaboration of a plan to work out the scale and detail of defense production conversion. The new plan was explicitly tied to the reduction of military output stemming from the 19.5 percent announced defense production reduction. Belousov justified the reductions in terms of the lower demands arising from the INF treaty, the ongoing negotiations on strategic arms that foresaw 50-percent reductions, and the "significantly improving international climate."  

The defense production cutbacks began to affect specific plants almost immediately. The Minister of Defense Industry, P. Finogenov, said that in his whole career in defense industry, "I can't recall such a major switch as that which started last year." And a group of enterprise directors in a round-table discussion said that a "reduction of defense expenditures by five percent has produced quite an effect in virtually all branches." When one director mentioned that he was notified of the cancellation of one order on 25 December, another responded: "That's not that bad. One of our orders was voided in March." These cancellations were sudden and unexpected, leaving the enterprises without a plan, without orders, and without inputs or financing, but with factories full of employees and managers expecting to be paid their regular salaries; this situation sent the managers scurrying to find civilian work to fill up the released capacity.

Events now seemed to be moving faster than could be accommodated by the planning process: toward the end of March 1989, the Deputy Defense Minister V. M. Arkhipov could point only to "a partially elaborated plan for the conversion of military production, the utilization of defense industry equipment, buildings, and facilities for civilian production, and the redistribution of material thus released into the national economy." By the beginning of May 1989, leaders of the Ministry of Machine Building began to speak in tones of distress, if not panic: "In cutting back military programs so drastically, we had to resolve the problem of how, in a very short space of time—basically simultaneously with in-depth conversion—to fully exploit our branch's potential." 

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25The 5-percent reduction in defense expenditures mentioned in this discussion could be the first portion of the 19.5 percent figure stated by Gorbachev.
Speakers at a June 1989 military conference on defense industry conversion complained that there had not been produced a "comprehensive concept for the development of the Armed Forces that takes into account not only the changes in military doctrine, but also the new socioeconomic developments." By July, it was announced that working groups for a national conversion program had been set up in the Central Committee, Defense Ministry, Foreign Ministry, Gosplan, and other ministries and departments. Work, however, was apparently at a preliminary stage, actual conversion was going on spontaneously—stimulated by the cancellation surprises of military orders.

The new Supreme Soviet Defense Committee in early August discussed guidelines for a state conversion plan that the Congress of People's Deputies had ordered the government to finalize by the end of 1989. This end-of-year due date for the plan became the formula adopted by most commentators on the subject, as many defense industry enterprise managers struggled to cope with their loss of military orders. However, year's end did not see the public appearances of this plan.

The Ministry of Aviation Production's plants, design bureaus, and research institutes have all experienced the effects of declining military demand. In a survey of the Soviet aviation industry by the magazine *Aviation Week & Space Technology*, defense cutbacks were said to be influencing the future plans of all the establishments visited by its journalists. With the decline of military orders, the defense share of output of the Zaporozhye aviation engine production association fell from 35 percent in 1988 to 27-30 percent in 1989. In the formerly all-military Sukhoi design bureau, four new civil designs are in progress. The goal is to expand civil aircraft activities to 50 percent of the design bureau effort. The general designer Mikhail Simonov has said that the shift is prompted by significant military spending cuts. In the Progress engine design bureau (previously headed by general designers Ivchenko and Lotarev), the scaling back of military production has led to the recent decline in the technical workforce. The exporting agency Aviaexport is attempting to push civil aviation sales and consumer goods produced in aviation plants in order to ameliorate the
projected 20 percent reduction in primarily military aviation production in 1989.\textsuperscript{33} And in late 1989, the head of the premier aviation research institute, the Central Aerohydrodynamic Research Institute (TsAGI), was actively seeking joint ventures in the United States, noting: "I have thousands of talented scientists, engineers, mathematicians, and programmers, and unique types of equipment such as hypersonic wind tunnels, that can be put to commercial aviation use. We can offer cheap, experienced brain power to a world market."\textsuperscript{34}

This sequence of events indicates an accelerated pace of defense industry involvement in civilian output since early 1988, even before the adoption of reductions in military production. Events began to move faster than plans and enunciated policy. Defense plants were being told of cancellations without the opportunity to plan or prepare for alternative outputs. A missile designer with 32 years experience, three special state awards, and 56 inventions to his credit, told about his dismay at the turn of events: "I was shaken by the news—no one now needed what I had been doing all my life. I heard about it at a very large meeting that I attended as an expert."\textsuperscript{35}

Quantifying Conversion

Plans for defense industry call for the output of enterprises of the "defense complex" designated for "peaceful purposes" to rise from the present 40 percent to 50 percent by 1991 and to 60 percent by 1995. We can decompose this growth in the share into two sources: the announced reduction of approximately 20 percent of defense output that will be transferred to civil purposes; and an additional growth in civilian production capacity in defense industry. Under these assumptions, the plans would call for the total growth of civilian output of 8.75 percent annually over the 1989-1995 period, or by 6 percent over and above the gains flowing from defense conversion.\textsuperscript{36}

It is unlikely that defense output can actually be converted ruble for ruble into civilian uses. Not only will additional investment be required to effectuate the conversion, but the efficiency of conversion is also likely to be considerably below 100 percent. Meeting the


\textsuperscript{34}Interview by author, November 1989.


\textsuperscript{36}If the present levels of output are indexed at 60 for defense and 40 for civilian, the 20 percent reduction of defense output that is to be transferred to civilian uses would generate an index level of 48 for defense and 52 for civilian output by 1991. An additional growth of the civilian portion of defense industry of 20 index units to 72 by 1995, while defense output remained constant at 48, would place civilian output at the designated 60 percent share of total output.
civilian output goals, therefore, will require either greater cutbacks in defense or more rapid growth of purely civilian capabilities in defense industry; consideration of the present state of Soviet politics and the economy suggests that the former is more likely than the latter, but also that the planned goals will not be achieved.

The 3500 types of equipment for which defense industry is responsible make up 36 broader groups of machine systems. The Minister of Aviation Industry, for example, was given responsibility for five such groups, which includes equipment for the processing of fruit and vegetables and the production of starch, syrup, and pasta products; machines for the canning industry; and equipment for the bagging and packaging of dry, free-flowing products. The Minister of Aviation Industry, A. S. Systov, personally attested to the Council of Ministers that his ministry would successfully implement production of the first modern, Soviet-made macaroni production lines within a year.

Between 1988 and 1995 (that is, within eight years), defense industry is being called on to increase its production of equipment for light and food industry by 130 percent, or by 11 percent annually. This production will include 140 types of complex consumer durables, 1400 new equipment categories, and "virtually the entire range of machine tools and machines" that light industry requires. Indeed, it is claimed that 345 defense industry enterprises are already involved in the production of equipment for the food and light industries and in 1989 account for more than one-fifth of such output. When these plans have been fulfilled, defense industry enterprises will be responsible for R17.0 billion of processing equipment output, or almost half the R37.0 billion total volume of deliveries to the agroindustrial complex.

Belousov noted that military plants had begun civilian production programs in the late 1960s—a move initiated by General Secretary Brezhnev—but that this process was accelerated in the last few years. Defense factories are now manufacturing 2000 categories of final consumer goods including, in 1988, 10 million television sets, 95 percent of Soviet-made refrigerators, 62 percent of washing machines, and 69 percent of vacuum cleaners. This list of final consumer goods is planned to be expanded in number and in technical quality.

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40These figures probably include the output of the 220 former Minlegpishekhinash enterprises.
What do these current changes and plans amount to in terms of defense industry capacity and total resources? Defense industry has always produced some supplies and products for civilian industry and consumption, just as civilian industry has supplied the military with inputs ranging from raw materials to finished products. Brezhnev gave a boost to the defense industry's involvement in helping to relieve civilian shortages in the late 1960s, and by 1971 could boast that 42 percent of "defense industry" output was then serving civilian purposes. However, it was never clear just what that 42 percent comprised. The best guess was that it included only production (and not services) of the Ministry of Defense Industry—just one of the nine defense production ministries.

Recent estimates by Blaine McCants draw on the detailed investigations of Julian Cooper on the civilian production of defense industry. McCants notes that not all civilian output of the defense sector is in machinery output or in manufactured goods more generally: construction and other services are also produced, as are non-machinery manufactured goods, such as furniture and china tableware. McCants estimated shares of machinery-type output (producer durables and consumer durables) for the period 1965 to 1985; for 1985, he also accounted for the transfer of Minlegpischemash and for the production of non-machinery goods. (However, because many services and some consumer durables are not included in these estimates, they should be considered as minimum lower bounds). McCants' calculations reveal a doubling of the civilian share of output from 1965 to 1985, with estimates of the 1985 share varying around 40 percent, depending on output definition.

In early 1989, Prime Minister Ryzhkov claimed that "forty percent of the products manufactured by our defense industry are also non-military items"; these same figures have now have been mentioned repeatedly. Consideration of the Soviet statements along with the McCants analysis suggests the following: The civilian machinery output of defense industry in 1988 was around 40 percent of defense industry's machinery production; including consumer durables and other goods and construction and other services would add another percent or so; and the transfer of Minlegpischemash raised the contribution by around 3 percent. Altogether, then, total defense industry production of civilian output is around 40-45 percent of total output. Therefore, the current drive begins with a substantial contribution to civilian purposes already being made by the defense industry.

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The walls between defense and civilian industry that protected defense R&D and production from the deleterious effects of civilian planning and management are now crumbling, and have been for the past decade.

**Methods of Defense Industry Conversion**

The planned growth of civilian output in defense industry can be accomplished in several ways: through the transfer of plants from civilian industrial ministries to the defense complex; through the conversion of entire defense plants to civilian output; and through the "reprofiling" of plants that will also continue to produce defense products.

**Transfer of Plants to Defense Industry.** The experience gained with managing the transfer of Minlegshipchemash enterprises to the defense complex has demonstrated the effects of long-term neglect of light industry and of the real demands now being imposed on the defense sector. Among the first things that high-level defense managers discovered was that 60 percent of the equipment at the transferred enterprises was worn out, and that only about one-third of the planned output could actually be produced.

Further transfer of entire light industry enterprises to the defense complex will likely require considerable additions of real resources to bring them up to planned levels of output. They will require investment goods, materials, and technical and design manpower, not to speak of valuable management attention. The chairman of the Council of Ministers emphasized this point when he noted that the country's mighty defense complex, "which commands an enormous scientific, technical, and production potential, can and must cope with this problem" of the disbanded light industry. Whether the accumulating experience of working out the problems of the transferred light industry enterprises will encourage more such actions in the future remains an open question.

**Total Conversion of Former Defense Plants.** The total conversion of defense plants to civilian production is another possible method of increasing civilian output. Although the possibility has been widely discussed, implementation is almost invisible. In a discussion of the serious problems that would be created by radical and rapid redesigning of production areas, technological processes, and equipment, VPK chairman Belousov described an experiment in which several defense plants would become "models" or "test sites" where conversion methods would be "broken in." However, the experiment will involve only three plants, and only the plans for these experimental units will be prepared in 1989, with the

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actual conversion to take place later.\textsuperscript{46} No other mention has been made of instances of total conversion. The three designated plants were described in late 1989; their full conversion was then planned to be completed from 1990 to 1992.\textsuperscript{47} However, several defense industry ministers have described the reorientation of new factories that are under construction or that are yet to be built. The total conversion of such plants offers greater flexibility than the reorientation of those that are literally set in concrete.\textsuperscript{48}

**Partial Conversion or “Reprofiling.”** The planned output of civilian goods in the defense industry will have to depend primarily on the partial diversion of capacity of existing plants in addition to the transferred 220 Minlegpishchemash enterprises and the experimental units designated for total conversion. As indicated above, many defense establishments are already involved in civilian output; their activities will be expanded, and additional defense plants will be drawn into this effort. In 1988, for example, 345 “munitions factories” had become involved in the production of equipment for light and food industries.\textsuperscript{49} New enterprises, either on the drawing boards or just coming into a productive state, were reoriented for the output of civilian products, and 205 research institutes and design bureaus were reassigned to design equipment for the agroindustrial complex.

The transfer of Minlegpishchemash plants was also a means to transfer responsibility for their product lines to defense industry managers—and not only the existing product lines, but improved models and products incorporating higher technological levels. The decrepit state of the transferred industrial equipment, the poor training of the labor force, and the laxity of quality control shocked the defense managers. In order to meet the planned output of the disbanded ministry, the defense production ministers found it necessary to bring in their own plants, specialists, and design bureaus.

Not only are existing resources being transferred and diverted to civilian uses, but investment funds allocated to defense industry are also being rechanneled. Much of this investment is in social construction of apartments, new plants, and equipment.

What are the financing sources for all these efforts? Ryabev cites several sources: retooling from the enterprises’ own funds and centralized ministry funds; Gosagroprom funds for new types of food processing equipment; and the state budget for new construction. “But it is important to stress,” Ryabev emphasized, “that the USSR Ministry of Medium Machine

\textsuperscript{46}Sovetskaya Rossiya, February 10, 1989, op cit.
\textsuperscript{47}“Conversion—In Action,” Pravda, September 1989 (No. 18), pp. 10-11.
\textsuperscript{49}VPK chairman Belousov statement, reported in TASS, 22 February 1989, FBIS-SOV-89-035, p. 104.
Building will not obtain a single kopek in additional investment.\footnote{Goods to be Produced by Defense Industry Plants," Izvestiya, November 9, 1988, p. 4 (FBIS-SOV-88-218, November 10, 1988, p. 70).} This statement presumably means that there are new sources and new uses of investment funds, but that the aggregate amount remains unchanged.

Thus, the policy is drawing on substantial increments of resources from defense industry—and this was occurring even before the Gorbachev announcement of reductions in military expenditures. Interviews with ministers and other high-level officials of most of the nine defense production ministries confirm and generalize the observation made by Ryabev.

The funds that have been appropriated for the Ministry of Radio Industry in 1989 for building houses and sociocultural facilities will be used for the personnel of the refrigeration equipment enterprises to their fullest amount.\footnote{Refrigerators for the APK," Ekonomicheskaya Gazeta, No. 48, November 1988, p. 4, (JPRS-UMA-89-003, February 13, 1989, p. 59).}

The Ministry of General Machine Building] has decided to increased the financing of [retooling of transferred plants] by a factor of 2.5 to the detriment of existing planned subjects.\footnote{Defense Changes Profession," Sotsialisticheskaya Industriya, February 7, 1989, p. 2 (FBIS-SOV-89-030, February 15, 1989, p. 81).}

Our main aim [in the Ministry of Defense Industry] is not just to boost output of food industry machines but to improve their technical standard and quality. . . .

This sector has been starved of modern equipment. . . . Only one-fourth of the entire range of items transferred to us last year was up to modern standards. . . .

We are essentially creating a fundamentally new sector. . . . Dozens of our plants, design bureaus, and technological institutes are already involved in this work. . . .

A special section for light industry machines has been set up within the ministry's scientific and technical council. . . . The first thing that surprised us [about the transferred facilities] was that a number of these plants did not have any consumer facilities. No housing had been built for many years and talented young people did not join them. Nor were there any experimental production facilities. . . .

We shared our resources and best cadres with them.\footnote{Instead of Missiles and Tanks," Pravda, March 14, 1989, p. 2 (FBIS-SOV-89-050, March 16, 1989, p. 89).}

Thus the Ministry of Medium Machine Building not only assumed the responsibilities of the disbanded Minlegpishchesh marsh in producing equipment for dairy plants, and took over these plants, but also began to turn out such products at its best enterprises. Even experimental divisions joined such operations.\footnote{Moskovskaya Pravda, March 21, 1989, op. cit.}

Of course, we cannot do without capital investment, (proclaimed the First Deputy Minister of Machine Building): Some production units are geared toward a specific product and cannot offer anything else. They will have to be dismantled.

Conversion requires substantial diversions of defense industry resources to meet the responsibilities of the transferred enterprises, over and above the resources required to carry
out the conversion arising from defense reductions. One of the more important of these resources is management attention and energy—from the minister, to the enterprise directors, to department managers and specialists. In addition, this focus extends upward to the VPK and Party Secretariat. The head of the VPK has been the chief spokesman on the conversion issue and appears to have had responsibility for developing the conversion plans and perhaps even the comprehensive plan for agroindustrial processing equipment. Belousov's television appearances on behalf of consumer goods place a political and public spotlight on the performance of defense industry in satisfying these needs.

EVALUATING CONVERSION

Resources, privilege, and priority do not guarantee success in converting to civilian production. One cynical observer summed up a great deal of Soviet economic experience with his own evaluation of high priority projects in the transportation industry—the automobile and truck ventures promoted by Brezhnev: "You cannot obtain good products without excellent machine tools, but the experience of VAZ and KAMAZ, which have mainly imported equipment, shows that we have learned quite well how to produce poor products with excellent equipment." Even with priority and good equipment, the constraints and incentives of the broader economic system can interfere with and impede effective production and efficient processes.

Defense Industry Prospects in Civilian Production

The Realities of the Civilian Economy. The strengths of the defense complex derive from its privileged status. These strengths will be available for civilian purposes—at least for a period. But they are wasting assets. Their continued contribution will depend on their maintenance and sustenance. In addition, as defense industry enters the civilian sphere more broadly, it will confront the impediments faced by the disbanded ministry it absorbed: low priority, uncertain supplies, inconsistent plans, misplaced incentives—in short, all the deficiencies of the Soviet economic system.

Among the first rude facts of life faced by enterprises converting to civilian production were the supply problems endemic in the Soviet economy. As one article noted, "When getting involved in civilian production, the defense enterprises will have to encounter the elements of the planned market, from which nobody has ever emerged unscathed." The

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Minister of Defense Industry warns, "The conduct of our associates from the civilian industry and local organs of territorial management once again prompts caution. . . . There are holdups in our supply of electric motors. The shortage of progressive packing materials, which should be provided by enterprises in the chemical and light industry branches, also impedes things." A military observer foresees, "With conversion to civilian production, . . . they will lose the priority right to receive financial and material resources at short notice." One solution to these problems is the classical Soviet organizational response to uncertainties imposed by suppliers—to supply as much as possible oneself or under one's direct control. Of course, this rational response to supply uncertainty has been condemned since the beginning of Soviet centralized planning as inefficient because it does not allow scale economies and specialization. The director of a machine building association described his own approach to the supply problem:

To be honest, I would never try to assimilate an article for which I do not have everything necessary at my disposal. Take, for instance, water-based emulsion paint. This item requires eight components, and we obtain them all through direct links. Therefore we are boldly incorporating an additional R2 million worth in the context of conversion. . . . We required subassemblies that are not produced in our country. Buying them abroad means wasting time and spending foreign currency. We had neither, so we made the subassemblies ourselves, without (please note) raising any questions with the ministry.

A deputy minister of Machine Building summed up the experience of defense industry managers:

When we embarked on the path of conversion, something struck us immediately. The machine tool builders often supply the wrong thing for the implementation of specific tasks. Even before, the supplying branches used to let us down, but now the difficulties are even more acute. . . . Out of an order of 5000 items of equipment, Gosplan has allocated only 2700 for 1990. Many things are not produced in our country at all. So we will have to set up our own machine tool building.

I had an uncle in the wholesale and supply business who noted, "To be a good salesman, you need a smart buyer." A universal complaint of the Soviet defense producers is that—unlike the military buyer—their civilian customers do not know what they want. The

60 Ibid.
deputy minister of Machine Building complained: "Something else also causes concern; leaders of the agroindustrial complex have no clear idea of their own requirements—what kind of equipment is needed, when, and in what quantity."61 This view was repeated with concrete detail by the deputy chief of the Main Scientific and Technical Directorate of the Ministry of Radio Industry: "By 1995 we must produce 1000 fast freezing systems. Unfortunately, this work is being obstructed by Gosagroprom, which—one would think—should be very interested in such equipment, but which so far has not even submitted technical specifications, not to mention engineering documentation."62 Late demands, incomplete specification, and wildly erratic quantities are other complaints leveled against civilian customers. Thus, a characteristic of the defense supply-demand relationship that has helped it to perform satisfactorily—having direct relations with a knowledgeable and demanding customer—is often denied to the supplier of civilian equipment, with deleterious consequences.

Labor Problems in Conversion. Since mid-1989, high-level managers and political representatives have made a point of enunciating a conversion labor policy in which defense workers would not suffer from a transfer to civilian production. Leading this effort has been the Military Industrial Commission, supported and encouraged by the Party's defense department and the new legislature.

VPK head Belousov, in his June 1989 acceptance speech to the Supreme Soviet following his renomination to the post declared that a major point of his program would be "to not permit any tension in social questions at enterprises where the partial conversion of military production will take place."63 Then, in a July 1989 interview, he placed the problem of "social issues" at the same level as the solution of production problems. "It will be necessary to implement measures to resolve social issues linked with retraining specialists and the maintenance of salary levels."64 Later in the year, a VPK department chief said that "additional funds must be found for compensating the inevitable losses in salaries; employees of defense enterprises that have embarked on conversion bring this up in a frank matter."65

61Ibid.
If wages are not maintained, he claims, enterprises will lose valued workers. For these reasons, the VPK is also sponsoring the job placement and retraining programs.

This VPK view is consistent with the policy preferences expressed by deputies of the Supreme Soviet defense committee, who stressed the importance of "effecting conversion in a way that will not worsen the material position of personnel working in defense industry."66

Party secretary Baklanov has made the social and working conditions of defense industry a central point of his many visits around the country. Baklanov has been campaigning to stimulate local solutions to workers' demands rather than having enterprises rely on central programs. Housing, schools, kindergartens, and consumer goods have been the primary focus of his attention, even more than defense production itself. "Main attention during the party Central Committee secretary's meetings with the Volga people was devoted to eradicating this dangerous distortion—the serious and ingrained backwardness of the social and consumer conditions in which the aircraft builders [and other workers] lived and worked."67 Part of this effort is the contribution of defense plants toward production of consumer goods for their own use and for regional distribution. The party secretary has emphasized that conversion itself can go a long way toward improving the converted workers' lives.

Despite the widespread concerns over the probable declines in workers' living standards resulting from conversion, the wages and working conditions of defense workers appear to be quite varied. For example, in the Ministry of Medium Machine Building, "It is easy for machine builders to switch gears, and as far as remuneration for labor, workers of a military plant did not have any advantages at all."68 In a round-table discussion with three defense industry managers, an interviewer took pains to undermine the common notion of higher defense wages:

Under the influence of movies and a certain kind of literature, many people have developed the impression that workers and employees of defense industry enterprises rake in financial and social benefits using the shroud of secrecy and the lack of public control. Don't laugh. This is a serious issue. How true is it? Is the fear of losing privileges going to be an obstacle to conversion?69

The managers thoroughly agreed with the implication of the question, that defense industry wages were not higher, saying that the average monthly salaries at their enterprises in Moscow were only 228 rubles, 229 rubles, and 224 rubles. Concerning social benefits one said: "Everything was sunk into machinery, production, goods, and the human factor was not taken into account. . . . It is the customer who had unrestricted credit lines—our budgets were tight. Khozraschet and conversion will help our collectives to better solve social problems and retain personnel."\(^70\)

An economist noted that for ordinary workers, technical personnel, and scientists of defense enterprises,

conversion does not contribute a particular threat. Practically all the advantages in pay, social privileges, and so forth, which they had 10-15 years ago have, in effect, disappeared. The average level of pay at Moscow defense plants in machine building is now practically equal to the average level of this branch of industry, approximately 230 rubles per month.\(^71\)

Not only has the advantage accruing to defense workers vanished, but certain disadvantages have risen in relative importance. The negative aspects of work in the defense complex include "the system of secrecy, strict discipline, and tough control over product quality."\(^72\)

An industry analyst described an equalization of wage rates, which in the past were substantially higher in the defense sector. The higher responsibility of defense workers for quality work without compensating wages and the lure of cooperatives were causing a steady outflow of skilled workers from defense enterprises.\(^73\)

Not everyone agrees with these assessments of equalization of defense and non-defense wages. A department chief of the Tatar Gosplan spoke of the difficulties experienced by defense industry workers in the process of conversion. "It is extraordinarily difficult . . . to alter the psychology of people working for the Army and receiving wages 1 1/2 – 2 times higher than those of their colleagues in the regular branches, along with various other benefits. . . . Many industries have to think first and foremost how to keep, and not lose, qualified workers."\(^74\) An economist writing in Pravda confirms the existence of this problem: "Once high technology defense plants start producing consumer goods, they start losing their

\(^{70}\)Ibid.

\(^{71}\)Ibid.


\(^{73}\)Ibid.


skilled work forces." And, according to a deputy minister of defense industry, after conversion plans were adopted to produce new types of equipment, "from the workers we get letters signed by the committees of labor collectives and workers delegations: We will not do it; it is difficult." Although high defense-industry wages and other benefits are not universal, on the average, they are almost certainly higher than in light industry. Nevertheless, the differentials appear to be narrowing, and may not be as effective as in the past in attracting and keeping labor in defense enterprises, especially with the much greater opportunities to be found in the cooperative sector.

There now appears to be a general acceptance by managers within the defense industry that measures must be taken to maintain worker morale and stem the outflow of an experienced workforce. As a leading aviation designer told me, "Our best people are going to cooperatives, not the ones we would like to get rid of." Evidently defense industry managers are expecting central government solutions to this problem. However, Party secretary Baklanov's attempts to stimulate the efforts of enterprises may be an indicator that central solutions will not be forthcoming, and that it will be necessary for defense managers to solve their conversion problems through local initiatives. If so, this policy will require a radical reorientation in the approach of defense industry managers who have been protected from the many problems of the Soviet economic system.

**Enterprise Incentives.** What is the profitability of conversion? In one production association in the Ministry of Machine Building, profitability of consumer goods is 21-22 percent, whereas in defense output, "profits are much lower." In Medium Machine Building, a reporter comments: "Wholesale prices for military products set in our country are, putting it plainly, symbolic; they are not in line with actual outlays. Paradoxical as it is, your expensive goods actually turn out to have a low profit margin. Starting up the production [of civilian goods], which have a high profit margin, will allow defense industry enterprises to generate more profit." A defense manager commented, "It is difficult to understand, but the price for gold from our ministry was set at a substantially lower level.

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than from non-defense extractive industry enterprises. Isayev notes that the monopsonist defense customer can impose a very low price that does not allow for the profitability of production; and, he adds, "Today, this occurs quite often."

On the other side of the picture, we find that many defense enterprises have moved into civilian production with some trepidation. VPK chairman Belousov noted refusals of defense enterprises to conclude contracts, long delays in starting production, and lags in the assimilation of new types of product. An economist described the response to conversion in dismal terms: "So far, civilian production has been accepted by the country's military-industrial complex as secondary, imposed, and temporary." Defense managers themselves cite a long list of reasons, in addition to those discussed above, for their reluctance to move into civilian work: the barriers erected by secrecy; the possible decline of worker attitudes toward quality in their main defense lines as they adapt to civilian norms; the disincentives of price setting procedures for new products. The director of the Molniya machine building plant summarized his frustrations by reeling off a list of obstacles facing enterprises contemplating conversion:

Sooner or later the enterprise will encounter problems characteristic of civilian industries. They are already becoming apparent, first of all in the unsettled price-setting. . . . The infamous gross production indicator, expense orientation, and difficulties in material-technical supply stand in the way. Material deliveries are made through priority procedures when defense products are manufactured. New supply problems will arise as is customary for 'civilians.'

We are already seeing complaints of the high costs of defense-industry produced civilian goods. After only six months of involvement in food processing equipment, the State Committee for Prices was required to analyze sharp price increases on a long list of items.

Some early losses from conversion were to be expected, as it took time to master new production lines and different products. The Soviet political-economic system, however, in its traditional appeal to "haste," demands everything at once—conversion, investment, output, profits. As a result, a transition period to prepare properly for major disruptive change and

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79Ibid.
the provision of capital to finance such change have been made available only with great reluctance. The financial incentives for conversion, therefore, have tended to be negative.

The planned increase in wholesale trade has not taken place, and the provision of supplies is fitful. Direct contracting with other plants often involves dealing with the market power of monopoly suppliers who can charge exorbitant prices. Hard currency is not available for foreign purchases, and comprehensive plans have not been concluded for domestic production. The manager of the Khrunichev aviation plant, who described these supply problems, called for a VPK-like civilian organization—a "special center that will be engaged in economic relations between defense and civilian plants."86

The Khrunichev manager also revealed that although high-level policy makers "charged us not to forget about the needs of the people, still everyone secretly understood that they are not the main thing for defense industry interests."87 This sentiment has found echoes throughout the defense industrial sector. In Belorussia, certain defense industry leaders "regard consumer goods as something secondary."88 An analyst from an Academy of Sciences research institute opines that "civilian production will never have priority in defense enterprises that remain within the framework of the military complex... Can we say that the quality of refrigerators, television sets, washing machines, and vacuum cleaners produced in military plants satisfies us?"89 This sentiment was reinforced by party secretary Baklanov: "We should not delude ourselves here. We must always remember that we are responsible for defense above all."90

Because civilian production requires the tireless pursuit for supplies, the identification of users and their demands, and some control over cost, it is not surprising that defense industrial managers prefer the more secure world of defense orders, even if these are more demanding in some dimensions. This attitude was summed up in a journalistic investigation of the defense production ministries' response to conversion: "Increasing the volume of production of consumer goods hold no promise for the managers of defense industry plants. They receive their salary by virtue of their main products [i.e., military output], and they are

87Ibid.
primarily responsible for them. . . . They still prefer to ask and wait, when you now have to search and run ahead of yourself."\textsuperscript{91} In explanation of this situation, a shipbuilding executive referred to the habits engendered by defense procedures: "Allocation reigns here. This circumstance has spoiled us, and it has, putting it bluntly, altogether corrupted our trade."\textsuperscript{92} A representative from the Ministry of Trade confirmed these attitudes when he complained of his fruitless attempts to obtain products for a trade show: "We have been chasing representatives of industry for weeks now. We have been unable to drag them to the fair even with the help of ministers."\textsuperscript{93} The chief engineer of a Department of Consumer Goods (note the creation of this new directorate) in the Ministry of General Machine Building responded to the plaintive cries of the Trade Ministry with his own confession of impotence: "The plants have become out of line. They are out of control now. There has been no response to all our calls and telegrams."\textsuperscript{94}

**THE TRADITIONAL ASPECTS OF SOVIET CONVERSION POLICY**

**The Conversion Campaign**

A customary Soviet approach to major change is through agitprop and campaigns. The frequent trips and public appearances of Party secretary Baklanov and VPK head Belousov are a visible part of this effort. The attempt to inculcate new values through repetition and rhetorical emphasis is a campaign technique now being applied for the benefit of conversion. The voices of past campaigns echo through a speech of Politburo member Ligachev:

> The leaders of all defense complex ministries have not been equally responsible and Party-minded in their approach to fulfilling the Party Central Committee and government decisions on creating a modern food industry . . . We believe that the ministries will draw the correct decision from the criticism. It is time now to inculcate in defense industry collectives a respect for output intended for citizens at large.\textsuperscript{95}

The Military Industrial Commission, in October 1989, evaluated the defense industries' contribution to the agroindustrial complex. VPK head Belousov summarized developments by noting that "the defense complex's attempted marriage with science and

\textsuperscript{92}Dib.
\textsuperscript{93}Dib.
\textsuperscript{94}Dib.
practical needs is turning sour. This gloomy evaluation of the first two years of conversion experience was both predictable and inevitable, given the initial high expectations and the absence of any other real change in the Soviet economy.

The one clear political focus of conversion is the turning away from defense and industrial investment, with a shift in leadership preferences toward consumer welfare. Virtually all of the targets of conversion point directly to consumer goods or to the machinery and technology for producing them. In contrast to much of the rhetoric supporting consumer welfare of the past twenty years, rhetoric is now matched by policy and implementation.

Unfortunately for the success of conversion, implementation follows classic Soviet lines: large transfers of resources directed by a campaign approach to mobilizing energies and managing details. The conversion campaign, though, has not even had the benefit of the integration, imperfect as it may be, of the classical Soviet Planning system. The process has had to rely largely on campaign stimulation and local initiative, with little in the way of either centralized structure or well-tuned incentives to support management actions.

The Necessity of Conversion Plans

One of the main reasons for the necessity of specific and detailed conversion plans is the lack of fungibility of budgets and monetary resources. Simple reallocation of budgets is insufficient in the Soviet economic system to assure the output of a new mix of products. Such a redirection must be explicitly planned and commanded by the central authorities. This requirement was graphically described by the chief designer and director of a defense industry institute:

In the absence of the ruble as a yardstick, ... and with arbitrary prices, it is impossible to simply take a ruble out of, say, tank production and increase (let us say) the pensions of retirees. The funds actually freed up from outlays for the metal of tanks consist of entirely different rubles, which do not turn directly into wages.97

This point was reiterated by the chief designer of an aviation design bureau: “We have thirty kinds of rubles—for wages, planned materials, foreign goods, manufactured goods, profits, investment—and not one of them can be substituted for another.”98 In the Ministry of Instrument Making (Minpribor), khozraschet has given the enterprises the opportunity to

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98Interview with author, November 1989.
earn money, but they cannot spend it at their own discretion. “Enterprises have R500 million under the mattress. . . . They have their own economic ‘notes’—goals, indicators, normatives, incentives—governing the tunes they can play that lead production away from the goals proclaimed in the decisions of high Party and state agencies. . . . and the products the country needs.”

Another barrier to defense industry enterprise autonomy in conversion activities is that organizations often do not possess all of the necessary functions for independent behavior. Research institutes, design bureaus, and production facilities specialize in their own narrow range of activities. In recognition of this problem of fragmentation and dispersal of functions, Party Secretary Baklanov has announced the creation of large association and amalgamations of some defense enterprises in the Kuybyshev region in preparation for the transition to khozraschet. However, there is no additional evidence of how widespread this process is likely to be.

But, it is not just that production and R&D is fragmented: in addition, investment is controlled by the ministry; supply has been organized by the VPK, the State Planning Committee (Gosplan), and the State Committee for Supply (Gossnab); and demand is formulated by the armaments’ directorates of the armed services. Moreover, defense industry organizations typically face monopoly suppliers of inputs and do not dispose of the finance, credit, or organizational authority to create new suppliers or to recombine their own activities with other potential collaborators.

In the Soviet economy, still dominated by central planning and ministerial authority, plans are seen to be essential by defense industry managers who—in any event—have little experience in operating in the more fluid circumstances of market-like conditions. As expressed by an economist attached to the Council of Ministers,

It must be said bluntly that most defense sector managers are not yet ready for choosing a new configuration for their output and position in the market for nonmilitary output. They have become accustomed to regular, generous clients, and are unable to analyze and forecast the market situation. . . . Therefore, a precise, long-term program for the conversion of the military economy is needed.

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This expert goes on to note that, even though plans are needed, defense enterprises will also have to engage in marketing and learn how to submit to market demands.

The necessity for top-down planning of conversion is not fully accepted by all parties. Some Soviet specialists believe that the appropriate approach is for each enterprise to develop its own transition plan. However, the dominant school of thought proposes that a national plan of conversion must be compiled first, taking into account changes in defense plans and doctrine, the resources that would be released, and the overall needs of the civilian economy. Only then would the lower-level organizations be able to plan their own operations in a satisfactory manner. Of course, the benefits of a planned economy are expected to give the Soviet Union a special advantage in the creation of “great national programs, as the national plan of conversion must be.”

A third voice in this debate asserts that the very notion of planning conversion runs counter to Gorbachev’s economic strategy. “The fact that at present, after the transition of virtually all enterprises to complete economic accountability and self-financing, we have to talk about a planned conversion of defense industry enterprises in itself testifies that the economic mechanisms are not working yet.”

However, the move to economic accountability in the defense industrial sector appears to be moving slowly. Full transfer to khozraschet by all organizations is not to be attained until the beginning of the next Five-Year plan; the full instructions for implementing khozraschet had not been issued by the end of 1989, and it appears that movement in this direction is uneven across the different defense production ministries and hundreds of enterprises.

There is clearly a split in the preferences of defense industry managers between autonomy and plans—with many individuals preferring independence under a reformed economic mechanism, but choosing plans under the existing system. A conference on conversion organized by the Ministry of Defense pointed up these conflicts. Many defense enterprise leaders and specialists judged that “it would be expedient if there were no centralized imposition of the full range of output for civilian purposes. Labor collectives ought to be given greater powers to resolve these questions.” However, many enterprises

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103Ibid.
105Interviews with author, November 1989.
actually producing according to their own decisions ran into serious problems. A scienceproduction association in the Ministry of Radio Industry lost millions of rubles "due to the demolition of the economic management system [presumably from the transition to khozraschet] and the lack of a clear-cut concept of conversion. . . . Over a period of about 6 months, thousands of people found themselves out of a job." 107 This conference also identified difficulties associated with the monopoly position of suppliers, the absence of competition, and the dominance of the "cumbersome, cost-based military-economic mechanism" in relations between industry and the Defense Ministry.

With the stalled transition to wholesale trade called for in the earlier phases of economic perestroika, there is a natural desire to rely on the traditional methods of planned supply. A department chief of the Tatar Gosplan remarked, "It is necessary to take the production of agricultural and processing equipment at defense complex enterprises out of the decentralized order process. They should be granted state orders, which provide material-technical resources." 108

Full-scale planning for conversion seems to be the preferred method of attacking the problem, but there have been complaints that this process is taking too much time. Prime Minister Ryzhkov was already complaining of delays in October 1988.

The only thing we are not satisfied with is that things are moving here very slowly. Igor Sergeyvich [Belousov], time has been lost. Time has been wasted on organizational issues. While you were dividing up the factories, while ministers were sizing them up, getting used to them, . . . time was marching on, it was marching on inexorably. Today we do not have time to spend years resolving these questions. 109

In fact, though, many of the conversions are unplanned as enterprise managers find themselves with cancelled military orders and unused capacity. But planning does continue and forms the backdrop for the main discussions on conversion. Indeed, one military expert in the Ministry of Defense has even called for the adoption of national conversion plans in all countries contemplating reduced defense expenditures. "With the adoption by every interested party of a national plan for conversion, it will subsequently be possible to

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107 Ibid.
coordinate such plans at an international level, and could make for the most effective organization of this complex process.\footnote{\textsuperscript{110}Ye. Serov, "Coordinated Interstate Actions in the Sphere of Conversion Processes Should Have a Juridical Basis," \textit{Voennyi Vestnik}, July 1989 (No. 13), pp. 11-12 (JPRS-UEA-89-024-L, September 12, 1989, p. 9).}

**Redrawing Organizational Boundaries and Responsibilities**

The present plans and policies of using defense industry to bolster civilian production do not alter the fundamental orientation of the Soviet economy. Conversion is a form of the classic Soviet approach to economic growth through "extensive" methods. On the first blooming of the policy in 1987, the leadership was also indulging in an approach that has characterized many past attempts at improvement: It was redistributing responsibilities and redrawing boundaries. Rather than allowing autonomous units to coordinate and motivate economic behavior through markets, the Soviet philosophy has been to use hierarchical, administrative structures; if one organizational arrangement does not work, the customary solution has been either to redraw boundaries to include more operational units within a manager's authority or to expand the number of functions under the existing organization. This tendency has a long history: If a plant cannot count on its suppliers, then it produces its own inputs internally; if a ministry cannot coordinate affairs with other ministries, then it creates its own autarchic capabilities; if production enterprises cannot deal with research institutes and design bureaus, then the government organizes Science-Production Associations (NPOs); if Academy of Sciences institutes cannot transfer research results to production ministries, then it creates Inter-Branch Science and Technology Complexes (MNTKs); and if defense industry managers and methods do not perform well in civilian industry, then civilian production is transferred to the defense sector. The redrawing of boundaries to include more activities under a unified managerial umbrella has at times ameliorated some of the systemic deficiencies of the Soviet economy, but it has not altered the main characteristics of the system, and it has created its own unique set of problems—organizational gigantism, to name just one.

**CONCLUSIONS: ASSESSING CONVERSION**

**Conversion in the Unreformed Economy**

The absence of coordination is felt by defense managers in two ways: there is no conversion plan and no civilian VPK. The reduction of military expenditures, the transfer of Minlegpishchemash plants, and the several plans involving defense industry in civilian
output were all put forward without an integrating, overall plan. In the first years of
Gorbachev's economic perestroika, such an approach may have appeared viable as economic
policies then called for the growing importance of wholesale trade, the reduction of central
planning, the reform of prices, a heightened role for profit incentives, and a sharp reduction
in ministerial authority and other centralized management practices. If those policies had
been successfully implemented, a decentralized approach to conversion may have succeeded.
However, none of these policies has proceeded according to plan: It is not an exaggeration to
call them still-born. With the failure to implement the economic policies of perestroika, a
decentralized approach to conversion was handicapped from the start.

A good deal of coordination in the defense sphere was handled, not by detailed central
plans, but by the VPK and by the Party apparatus. Through the creation of supply pyramids
and VPK decrees, all participants in R&D projects and production knew their assignments—
regardless of organizational affiliation. These assignments were backed up by the political
authority of the VPK and Party. Such coordination is sadly missed by defense managers who
have been thrown into the unplanned, uncoordinated maelstrom of civilian production.

These hapless managers are further hindered by imposed inflexibility, reducing their
ability to adapt to circumstances. Ministerial constraints, organizational fragmentation,
poorly developed financial and supply markets, and the power of monopoly producers
impinge on the managerial discretion of enterprises.

Furthermore, both managers and workers often do not want to shift to civilian
products. They are neither as glamorous nor as technically challenging as defense goods.
Both managers and workers can lose pay and bonuses if they convert. And, undoubtedly, the
work can be more difficult and frustrating—not in a technical sense, but in getting the job
done in an uncooperative economy.

Whereas defense producers had longstanding and often intimate ties with their
defense customers, who were both knowledgeable and powerful buyers, their understanding
of civilian requirements is often quite poor. All of the problems arising from the separation
of producer from user in the Soviet economic system are repeated here, with the additional
complication of new assignments, new suppliers, and new products. Although many defense
producers are actively attempting to generate better information on the needs of their
customers, others are resorting to the simpler and more customary expedient of waiting for
the orders to arrive and producing according to the letter of the contract without any real
understanding of actual needs.
The Returns from Conversion

As defense enters the civilian world, it confronts all of the usual problems—plus additional ones created by the rush toward conversion and a partly reformed economy. Supply uncertainties and weak ties between producer and user are the first and most obvious consequences. High prices resulting from cost-plus pricing in defense, from the defense plants’ penchant for high-tech solutions, from the expensive capital equipment and labor, and from lack of experience in new product lines also mark defense output.

There will not be a ruble-for-ruble transfer from defense to civilian output. The efficiency of transfer, especially in the short run of perhaps five years, will be considerably lower. In addition, supplementary resources will be needed to implement conversion, with the first contribution of R4 billion explicitly acknowledged in the 1990 budget.

On the other hand, real resources are being reallocated. Competent technical and production people have been given new responsibilities; they are struggling to find the right products and searching for the real users. As usual, Soviet managers have been given an impossible task, and with intelligence, energy, and native wit they are marching forward in the latest campaign. As long as the political spotlight and high leadership focus can be maintained on conversion, the effectiveness of resource transfer will be stimulated. As attention shifts to the next campaign, energies will start to flag, but the benefit to the consumer sector will likely persist as a result of real political change and resource reallocation.

In conclusion, civilian output will benefit in the short run from the use of the high-quality resource base, experience, and management practices built up under the regime of defense industry privilege. It will also benefit in the longer run from the absolute reallocation of resources. To the degree that reallocation reduces the tautness of planned supply, it could ameliorate the endemic supply uncertainties facing civilian industry, but Soviet planners are unlikely to relax their push for output quantities greater than the system can accommodate. Over the longer run, the deep systemic problems of the Soviet economy will impose themselves on the defense industry’s production of civilian items. We are already hearing high-level complaints of unfulfilled defense industry production of civilian output: delays in macaroni lines in aviation, of jam equipment in shipbuilding, and of AIDS-related medical supplies from the electrical equipment industry.111

The continued commitment of high-level managerial attention to civilian output will depend on the persistence of the political push behind the effort, and this is very likely to diminish over time. We will thus find unfulfilled plans, shortfalls, and lower technical standards and quality levels than originally contemplated. Nevertheless, civilian output will no doubt be increased and improved, at a level perhaps that will even be visible to the average consumer.\(^{112}\)

---\(^{112}\)An analysis of the output of consumer durables of defense industry, based on figures released by the journal *Vestnik Statistiki*, May 1989, indicates that 1988 output was about 10 percent higher than in 1987 (in unweighted, physical quantity terms); John Tedstrom, "Defense Complex Contributions to Civilian Production: Is it Growing?" *Radio Liberty Report*, June 2, 1989.