RESEARCH AND TRAINING IN POLICY ANALYSIS

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I am too unfamiliar with the specific policy issues of principal concern in the public sector of the Federal Republic of Germany to be able to relate my comments directly to those problems. Therefore, what I will try to do instead is to make a number of observations addressing the six topics comprising the agenda for this Symposium. These comments will be based principally on my own experiences at The Rand Corporation and The Rand Graduate Institute, as well as on some familiarity with other institutions and activities elsewhere in the United States and, to a lesser extent, in Europe and in Japan. Special circumstances prevailing in West Germany may indeed warrant modifications in some of these general comments. However, at the level of generality that I will be addressing in my remarks, I am inclined to think that most of the points are likely to apply to research and training relating to policy problems in the West German public sector, too.

1. Experience Concerning the Research Situation

Good policy research can be likened to a camel: difficult to describe but easy to recognize. In the following remarks, I will try to identify a number of characteristics of policy research in general, and good policy research in particular. I do not intend these characteristics to be interpreted as dogmatically as they may sound. Rather, they should be interpreted as propositions which are more likely to apply to good policy research than to other kinds, although in practice all policy research is likely to depart in some respects from these characteristics.

In general, policy research views a problem as a system of interacting parts, and proceeds through a series of more or less formal steps: First, identifying the significant interactions characterizing the system—that is, building a more or less explicit model that describes how the

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system works; second, specifying the policy objectives as precisely as possible; third, designing various programs or policy alternatives; and finally, comparing and testing the performance of these alternatives in terms of some explicit criterion of choice that relates the alternatives to the policy objectives.

The testing should explicitly consider uncertainties in performance, including those that may result from the countermeasures that may be taken by an intelligent adversary (e.g., organizations, firms, or foreign countries) having different objectives from those ascribed to the decisionmaker. The testing should also explicitly consider externalities or side effects that may accompany each of the various alternatives. Usually, the test consists of running the alternatives through the model, and choosing as the preferred alternative that which minimizes the cost of achieving a specified objective, or maximizes a particular objective for specified costs. The policy or program that meets this test then becomes the recommended course of action within the confines imposed by the original operational model. In cases, and they are likely to be numerous, where trade-offs among the components of the objective function cannot be specified, good policy analysis should display the full vector of differential payoffs associated with the various alternatives. In the absence of pure dominance (that is, one alternative which performs at least as well as other alternatives with respect to all of the component objectives, and better on some of them), good policy research should display the inconclusive nature of the results through some sort of multi-dimensional scoring matrix which exhibits the program or policy alternatives, the dimensions of the utility or objective function, and the outcomes for each of the alternatives with respect to these dimensions. *

Good policy analysis generally focuses on a real policy or program issue. By this, I mean that it addresses a concrete problem in some specific activity of the public sector; for example, relating to defense budgets and forces, to developing new technology or improving existing

* There are algorithms for reducing these multi-dimensional utilities and outcomes to a single payoff scalar through Delphi-type processes, which Howard Raiffa has pioneered. For various reasons, which I won't go into here, I have some reservations about the merits of applying these procedures, or at least about the way they usually have been applied.
technology, to educational programs and how to improve their payoffs, to health care or health insurance, to unemployment, etc. The real problem, then, is how an existing program that purports to address one of these issues can be improved, or a new program that is better than the existing one can be developed, perhaps even by eliminating or reducing the government program that is presently in effect.

As examples of what I mean by "real" problems, let me cite a few in the United States that I am familiar with at Rand: (1) The relative effectiveness of gasoline taxes or import tariffs in promoting energy conservation, and providing incentives for developing new sources of energy supply; (2) government pricing policy for commercially-useful technology resulting from public R&D; (3) the relative cost to the military of contracting for services to be performed by civilian firms compared with training military personnel to provide these services directly; (4) the efficiency of substituting capital and new technology for labor in military activities, in the light of the increasing relative costs of labor in a volunteer armed force; (5) the effects of housing allowances on the supply of housing, etc.

The point about these examples is that in each case there is a specific program focus to each of the research questions.

Turning from research tasks to research methods, there are many points that we might want to discuss relating to types of models, large-scale versus small-scale models, the role and uses of "expert" qualitative judgments and opinions, etc. But let me confine my initial comment to one point. That point relates to the increasing tendency in policy research to analyze large data files involving thousands and even millions of separate observations, e.g., census data, social security data, data on health insurance claims, military manpower data, food and weather data, etc. These large data sets involve extensive use of computers in analysis; in probing the data files for relationships among variables; and in testing posited relationships that are inferred from existing theory in order to estimate the parameters of formal models, and thereby to help in comparing and evaluating alternative policies or programs. While this tendency is strong and increasing, and is, in general, highly desirable, it is subject to a particular shortcoming. The shortcoming lies in a tendency of some policy analysts to work on those problems that the available data sets conveniently
cover, rather than to search for and to develop data to help in working on problems that are genuinely important in the policy community. The para-
ble that comes to mind is that of the man looking for his key under the street light, rather than where the key actually fell.

Finally, on the matter of interdisciplinary approaches mentioned in the Symposium outline, there are two comments I would make. The first, which is implicit in my previous remarks and examples, is that in policy research the issues, models, data, and policy alternatives that are in-
volved don't tend to stay conveniently within disciplinary lines. The physical and engineering sciences, economics, social and behavioral and organizational disciplines and paradigms all tend to be relevant. Trying to define the problem so that it falls neatly within one discipline is very likely to make the results less relevant to public policy.

The other comment is to distinguish between interdisciplinary and multidisciplinary research. In undertaking and organizing policy research, it is easiest, and hence customary, to divide the work into segments with "inputs" being supplied separately by engineers, physicists, economists, and social and political scientists. The result usually is separate chapters or appendices that are more or less free-standing and hard to relate to one another. This is what I mean by multidisciplinary research. By contrast, real interdisciplinary research requires that members of the research team genuinely interact, that they absorb enough of each other's paradigms and vocabularies so that their communication and interaction improves over the life of the study, and the modeling, the comparisons among alternatives, and the policy results really integrate and synthesize the contributions of the several disciplines.* While this point is frequently acknowledged in relation to synthesis between economics and other social science disciplines, it applies equally for a wide range of policy issues with respect to physical science, engineering, and technology, as well as the other disciplines. For example, if one is working on the policy issue of pricing commercially-useful spinoffs from government-generated technol-
ogy, or on policy with respect to controls on high-technology exports to communist countries, or on the capital-labor substitutions involving new

*My colleague, Walter S. Baer, deals with this point in his Interdis-
technology that I alluded to earlier, one needs to have the research fully informed by a knowledge of the operating details of the associated technologies, if the results are to be genuinely useful for policy purposes.

2. Requisites and Problems in Applying and Realizing the Results of Research

My previous remarks included a brief summary of the standard ingredients and sequence involved in policy analysis: theory, model formulation, parameter estimation from the data base, designing and evaluating policy alternatives through the model, and comparing and choosing among the alternatives. This list omits perhaps the crucial ingredient involved in applying and realizing the results of policy research: implementation analysis. This key ingredient, which I have referred to elsewhere as "the missing chapter" in most policy studies, is concerned with the following sorts of key questions: If the policy results of the study stand up to careful scrutiny, then who needs to do precisely what by way of next steps? What organization(s) is (are) responsible for which next steps? What sources of inertia and opposition are these next steps likely to encounter? How can these resistances be overcome, and at what cost?

Answers to these questions need to be fed back into the re-evaluation of alternatives in order to compare the relative difficulty and feasibility of carrying them out. Indeed, sometimes the policy alternative which looks preferable when such implementation issues are ignored looks quite impractical when they are taken directly into account.

This general subject of implementation analysis, the so-called "missing chapter," is now receiving much more consideration and attention among policy researchers, especially those concerned with methodology, although it is still rarely incorporated into actual studies. The fact that such implementation questions are so rarely taken into account is probably the principal reason why many good policy studies rarely get translated into real policy changes.

A related factor that also contributes to the lack of impact of most policy studies is the absence of an essential though not necessarily large number of analytically sophisticated people within the potentially using agency or organization. Such people, who are capable and motivated to stay in close touch with the study, presuming it is done outside the agency, are
essential to help in translating its results in terms that will be directly usable and applicable in the responsible agency or agencies.

The subject of implementation analysis, as I have indicated, is presently receiving increased attention by people in the field. In brief, implementation analysis requires the following steps:

A. Identification of the "players," organizations, and individuals whose interest and activities are most directly concerned with the policy problem under examination. As part of this identification process, the precise interests, standard operating procedures, and resources available to these "players" need also to be explicitly identified. Potential barriers, as well as sources of potential support, are to be found in these players, e.g., their agency budgets, their professional "standards," their standard operating routines and procedures.

B. Estimating the counter-moves, resistances, and distortions that are likely to result from any given policy, say $X_i$, as a result of the players and interests noted in (A) above.

C. Consideration of the methods and costs, including political "bargaining" costs of meeting, adjusting to, compromising, or surmounting these resistances, in order to obtain an adjusted outcome to be expected from Policy $X_i$.

D. If the costs uncovered in (C), or the adjustment in the probable outcome associated with a given policy, turn out to be sufficient, the relative preferability among the several alternatives previously considered may have to be changed. In other words, a policy that looked preferable in the absence of such implementation analysis may appear to be distinctly "second best" once this analysis has been undertaken.
One of the concerns of people who have lately been addressing the issue of implementation analysis is whether the extension of policy research to include it does not perhaps usurp the proper function of responsible political decisionmakers in the public sector. It can be argued that the balancing of forces and conflicting interests, ethical values, distributional and equity considerations involved in implementation should more properly be left to those who are politically responsible for making such judgments, and that the analyst is neither professionally nor temperamentally particularly equipped to try to make them instead.

I am personally inclined to think this argument is something of a straw man. In one sense, there is small likelihood that analysts can really "usurp" this function: Responsible and effective decisionmakers will, in any event, exercise their own decisive judgment on these questions of implementation. Rather, the research issue is whether the analyst should attempt to help in structuring the implementation problem through the sort of steps and procedures that I have outlined above, recognizing full well that in the final event this part of the analysis will be subject to especially careful scrutiny and "second-guessing" by the responsible decisionmakers, as indeed it should be.

In any event, I know of no policy study, either at Rand or elsewhere, where an exemplary job of implementation analysis has yet been done. This is an aspect of the field that remains to be developed.

3. What Research Implies for Teaching

My comments on this topic will, for obvious reasons, draw heavily on my experience in The Rand Graduate Institute. The Institute offers a small Ph.D. program in Policy Analysis based on a curriculum that combines formal course and seminar work on theory, tools, and techniques together with applied work—"on-the-job training"—working on ongoing policy research studies in which students participate.

As I have noted earlier, policy research does not stay conveniently within the boundaries of a single discipline. Economics, technology, engineering, social and behavioral sciences, and statistical and mathematical skills and issues all are usually involved in major policy research studies. This generalization applies to a greater or lesser degree in
policy studies involving such widely different subjects as the structure of NATO forces, the development of alternative energy technologies, and virtually all of the defense and non-defense subjects referred to in my earlier remarks.

The implication of this point for teaching is an interdisciplinary curriculum that cultivates in students and analysts an ability and a confidence to move comfortably across disciplinary lines, as the tasks of a particular policy research study require. In The Rand Graduate Institute, and in other public policy programs in the United States, this interdisciplinary curriculum involves formal course work in microeconomic analysis, data analysis and statistics, econometrics, case study courses on the role of technology in public policy decisions, and broader political, social, and normative courses dealing with the role of the expert in society, the scope and values involved in the policy sciences, and organization theory and analysis. This curriculum places heavy, though not exclusive, emphasis on quantitative and at least moderately mathematicized skills because, as indicated earlier, most current policy research involves increasing use of large data files, formal modeling, and considerable statistical and computational work.

In the case of The Rand Graduate Institute, another component of the curriculum is devoted to a retrospective examination of completed policy studies in various subject matter fields, e.g., education, health, and hospital operations, energy, research and development, strategic studies, communications and transportation. By focusing on a body of completed work in such separate fields, these workshops consider answers to the following types of questions:

a. What methods and data were used in the specific studies?
b. What alternative methods and data bases might have been used if the analysts had been as knowledgeable at the start as they were at the end?
c. What were the principal findings, and how closely did they follow from the methods and data that we used?
d. How were the study and its findings presented to the policy community, and with what impact?
e. What explanations can be given for the large or small impact on the policy community, and how might this have been altered?
Although these workshops bring students closer to real cases and applications, the final component of The Rand Graduate Institute's curriculum is intended to involve students even more directly in applications. This distinctive part, and I think most important part, of the curriculum involves what we have called "on-the-job training": The direct coupling of students to ongoing policy research studies, initially as relatively junior members of a multi-interdisciplinary research team, subsequently assuming greater responsibility. Over a three-year period, this experience is intended to facilitate the production of a substantial study that is both a contribution to public policy and to knowledge in the field, on the basis of which the doctoral degree in policy analysis is finally awarded. The importance of this linkage between formal study and theory and technique, on the one hand, and practical experience in ongoing policy studies, on the other, is perhaps the most significant implication of policy research for advanced training in this field.

4. Post-University Training

The few comments I have to make on this topic will also draw principally on my experience at RGI and to some extent at Rand as a whole. The students whom we admit to The Rand Graduate Institute have already had very substantial university training: A Master's degree or equivalent graduate training is one of the requirements for admission. Although the fields in which prior university training has been received tend to vary quite widely among graduate fellows in The Rand Institute, I think it is fair to say that those who have had some considerable prior exposure to mathematical and quantitative training tend to do better in absorbing and mastering the interdisciplinary graduate curriculum than those whose prior training is confined to the social sciences and humanities. Of course, there are exceptions to this generalization on both sides: Some with university backgrounds in mathematics and physics don't do very well, while some with social science backgrounds do splendidly.

Prior to setting up The Rand Graduate Institute five years ago, Rand, itself, functioned as a valuable source of post-university training in policy analysis, even without any formal degree-related effort along these lines. The Rand "alumni" who have subsequently assumed major policy
responsibilities in government are illustrations of this point. I think it is fair to say that most of the principal ingredients of post-university training that are valuable in this field, and which are formally embodied in the RGI curriculum, are also imparted informally and quite pervasively through the process of actually doing policy research in the institutional environment of Rand as a whole. Besides contact with advanced work in techniques and tools across a wide range of disciplines, these ingredients of post-university training include exposure to and interaction with agencies of the government, experience in communicating across disciplines and professional vocabularies, and a "close-in" exposure to the difficulties of trying to transcend established bureaucratic jurisdictions when the implications of policy research lead across the lines of established agencies and prerogatives.

5. New Institutions

My few comments on this topic are also heavily weighted by my long association with Rand. I can only hope they will not seem too parochial, as a result.

There are several positive, as well as negative points—"do's" as well as "don'ts"—worth noting in connection with the formation of new institutions in this field.

First, it seems to me highly desirable to have several institutions actively involved in both policy research and in training policy analysts. New institutions are desirable because competition is healthy in this field as in others. Competition among institutions contributes to higher professional standards, reduces the risks of biased work—or, at least, biased work that is not exposed—and promotes experimentation and innovation. The latter is particularly desirable in a field like this where the best ways of producing output are neither well-known nor stationary. I should emphasize that this point relates to training for policy analysis as well as actual research.

As to the desirable number of institutions, that depends on market size and on conditions of production which, I believe, entail major dis-economies of scale beyond some point.
Second, there are several organizational attributes associated with effective work in this area that should be kept prominently in view in setting up new institutions. Some of these attributes are implicit in my earlier comments: for example in research institutions, the importance of interdisciplinary work and an environment and staff congenial to it; and, in educational institutions, the importance of providing opportunities for "on-the-job training"--for direct experience in doing policy research and in interacting directly with the public sector bureaucracy.

With respect to institutions doing, or planning to do, policy research there are two other attributes that I believe should be of primary importance for people considering the setting up of new institutions. One of these is organizational independence, and the other is "close-in" access to information.* Without a substantial measure of both, I'm inclined to think new research institutions in this field are likely to be nugatory, or even of negative value.

It would take more time to develop this argument fully than I have, so I will confine myself to a few comments about it. Without organizational independence, the task of producing research that not only is relatively objective, but is also perceived by others to be objective, becomes extremely hard--and perhaps impossible--to perform. Without direct access to information that the policy community itself uses, the task of producing research that is relevant to policy and to the policy maker's perspective becomes equally difficult to perform. This is likely to be so even, and perhaps especially, where the research in question concludes that a different perspective--concerning goals or programs--should be adopted. If major changes are to have a reasonable chance of implementation, those proposing the changes need to understand how the problem looks from the "inside," and this understanding is unlikely without especially good access to information.

It is important to realize that there is a considerable degree of tension between these two attributes: government agencies are likely to be reluctant to provide full informational access to research institutions that are highly independent; and institutions that have "close-in" access run the

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*See also Baer, op. cit.
risk of compromising, or appearing to compromise, their independence. The tension is real, not just apparent. Keeping it within tolerable bounds is hard. I can't provide a formula for doing this, except to say that the task requires intelligent, resourceful, forceful, and responsible research management. If that blend seems formidable, as well as intangible, I can only say that it seems that way because, in fact, it is that way.

The symposium agenda posed a question concerning the potential role of new policy research and training institutions attached to trade associations, political parties, and government agencies. As the previous comments may imply, I am skeptical about this role because of the importance I ascribe to genuine organizational independence at the level of broad policy analysis. My own view is that institutions attached to political parties or trade associations are unlikely to have, or to appear to have, such independence. Consequently, the role of such institutions is more likely to be that of doing what I'd call "advocacy research," rather than the type of policy research I've been describing. Of course, advocacy research can also be good or bad, skilled or unskilled, and timely or untimely, but this is not the place to pursue this point further.

Clearly, much more can be added to these points, and I'm sure will be in the course of discussion.

6. Summing-up

Most of what I've said is already "summing-up." It probably needs amplification and clarification more than further summary. However, there is one final point I would add by way of suggestions for further consideration.

I am impressed by the opportunities that exist in this field for combining research with training; for performing what in economics is referred to as "joint production." The potential advantages of joint production are numerous and substantial. Successful training in policy analysis is measurably improved by direct and sustained experience in doing policy research, as I've already emphasized. Consequently, an organization engaged in doing
the latter effectively is perhaps particularly well-suited to undertake advanced training in this field, assuming its staff is both qualified and motivated to do so. Also, a small, highly selective training program, with a lively and enquiring group of graduate students, can help to stimulate and refresh an ongoing policy research enterprise. There are, too, some major savings in terms of the incremental financial costs involved in conducting training as a joint effort with policy research, which I can perhaps further elaborate in the course of the discussion.

These ideas were in the forefront of our thinking when the Rand Graduate Institute was established five years ago.

By the same line of reasoning, one can argue that universities that are already "tooled-up" to conduct training programs in this field, may have certain cost and other advantages in performing considerable policy research as a joint product with their educational efforts. This opportunity is certainly a real one. For various reasons that would take more time than I have available to treat fairly, I think there are serious practical difficulties that are likely to arise in the environment of most universities in trying to realize this opportunity.