



# The Future at Work—Trends and Implications

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**W**hat does the future hold for work in the 21st century? In a new study for the U.S. Department of Labor, RAND researchers Lynn Karoly and Constantijn Panis seek to answer this question. In particular, they examine how three major trends that will shape the future at work in this century—shifting demographic patterns, the pace of technological change, and the path of economic globalization—will evolve over the next 10–15 years. Then, they consider the implications of these trends for key aspects of the future workforce and workplace, including the size, composition, and skills of the workforce; the nature of work and workplace arrangements; and worker compensation. Their assessment of these underlying structural forces is based on relevant data and research and is intended to help all stakeholders—workers, employers, educators, and policymakers—make informed decisions.

## Shifting Demographic Patterns

Given population trends and trends in labor force participation rates, the U.S. workforce will continue to increase in size but at a considerably slower rate than in the past. During the 1970s, the workforce grew 2.6 percent annually, declining to 1.1 percent growth in the 1990s. Between 2000 and 2010, the annual growth rate is projected to equal that of the 1990s, but it is projected to slow in the next decade to just 0.4 percent and in the following decade to only 0.3 percent.

In terms of workforce composition, the trend is for a shift toward a more balanced distribution by age, sex, and race/ethnicity. The U.S. population and workforce have been growing older as the baby-boom generation ages; put another way, the workforce has become more evenly distributed across age groups. Also, steadily increasing female labor force participation rates, combined with declining male rates, have brought the labor force closer to gender balance. Finally, the inflow of immigrants has been largely responsible for a continuing increase in the racial and ethnic diversity of

## Abstract

Trends in workforce size and composition and in the pace of technological change and economic globalization will have implications for the future of work. Employees will work in more decentralized, specialized firms; slower labor growth will encourage employers to recruit groups with relatively low labor force participation; greater emphasis will be placed on retraining and lifelong learning; and future productivity growth will support higher wages and may affect the wage distribution. Given this, some policies may need to be reexamined.

the workforce, with Hispanics and Asians being the fastest-growing such groups in the workforce.

## The Pace of Technological Change

The pace of technological change—whether through advances in information technology (IT), biotechnology, or such emerging fields as nanotechnology—will almost certainly accelerate in the next 10–15 years, with synergies across technologies and disciplines generating advances in research and development, production processes, and the nature of products and services.

In the IT field, for example, advances in micro-processors will support real-time speech recognition and translation, and artificial intelligence and robotics are likely to advance further. The use of more intelligent robotics in manufacturing will support the ability to quickly reconfigure machines to produce prototypes and new production runs, with implications for manufacturing logistics and inventories. Further technological advances are expected to continue to increase demand for a highly skilled workforce, support higher productivity growth, and change the organization of business and the nature of employment relationships.

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## The Path of Economic Globalization

The future reach of economic globalization will be more extensive than before, affecting industries and workforce segments relatively insulated from trade-related competition in the past. For example, trade in services has grown from 18 to 30 percent of the total over the last 20 years, and some higher-skilled, white-collar jobs in the services sector, such as IT and business processing services, are now increasingly outsourced overseas. The new era of globalization—marked by growing trade in intermediate goods and services, expanding capital flows, more rapid transfer of knowledge and technologies, and mobile populations—partly results from inexpensive, rapid communications and information transmission enabled by the IT revolution.

Globalization will continue its record to date of contributing economic benefits in the aggregate. Although market share and jobs will be lost in some economic sectors, with short-term and longer-term consequences for affected workers, the job losses will be counterbalanced by employment gains in other sectors.

## Implications of Trends

These three trends overlap, as do their implications. Here, we highlight four of the more important ones:

- Employees will work in more decentralized, specialized firms, and employer-employee relationships will become less standardized and more individualized.
- Slower labor force growth will encourage employers to adopt approaches to facilitate greater labor force participation among women, the elderly, and people with disabilities.
- Greater emphasis will be placed on retraining and lifelong learning as the U.S. workforce tries to stay competitive in the global marketplace and respond to technological changes.
- Future productivity growth will support rising wages and may affect the wage distribution; the tie between employment and access to fringe benefits will be weakened.

Firms are moving from vertically integrated organizations to more specialized ones that outsource noncore functions and to more decentralized forms of internal organization. We can expect a shift away from more permanent, lifetime jobs toward less permanent, even nonstandard employment relationships (e.g., self-employment) and work arrangements (e.g., distance work). These arrangements may be particularly attractive to workers trying to balance work and family obligations or to the disabled and older people who would benefit from alternative arrangements.

In a tight labor market, employers can try to recruit groups with relatively low labor force participation. Changes in incentives associated with pension plans and reforms to Social Security may motivate older workers to retire later. Providing child care may make it easier

to recruit women with children. Also, changes in technology and in the workplace described above may make it possible to recruit more people with disabilities into the workplace. Immigration policy offers another lever, in particular to target highly skilled aliens, thus raising the overall skill levels of the U.S. workforce.

Rapid technological change and increased international competition spotlight the need for the workforce to be able to adapt to changing technologies and shifting product demand. Shifts in the nature of business organizations and the growing importance of knowledge-based work also favor strong nonroutine, cognitive skills, such as abstract reasoning, problem-solving, communication, and collaboration. In this context, education and training becomes a continuous process throughout the life course, involving training and retraining that continue well past initial entry into the labor market. Technology-mediated learning is a promising tool for life-long learning, both on the job and through traditional public and private education and training institutions.

Future trends in technology, globalization, and demographics will support higher wages and are likely to affect the distribution of wages, just as they have in the past several decades. In the absence of a strong increase in the supply of skilled workers in response to the higher returns to education, wage dispersion—particularly as measured by the gap between more- and less-educated workers—will likely remain at current levels or even continue to widen.

Meanwhile, greater turnover within traditional employment relationships and shifts to nonstandard employment relationships highlight the importance of fringe benefits being portable across jobs or even independent of jobs. Employers that offer benefits may move toward more personalized structures. Younger and older workers, for example, might be allowed to select those benefits that fit their circumstances, with cash wages adjusted to retain overall compensation levels. Information technologies and outsourcing may support this trend by reducing the costs of managing a more complex system of employee benefits.

From a policy perspective, many of the institutional features of the U.S. labor market—e.g., the laws and regulations that govern employment, hours, wages, fringe benefits, occupational health and safety—evolved in an earlier era. Given the above trends and implications, some policies may need to be reexamined. For example, are there distortions or unintended consequences with current policies that preclude desirable market adjustments? Are policies put in place to address market failures in the past less relevant, given circumstances today and their likely future evolution? Are there new market failures policy can address? Are there distributional consequences that could argue for government intervention? The book provides a context to address these and other important questions to prepare the U.S. labor market for the 21st century. ■

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This research brief describes work done for RAND Labor and Population documented in Lynn A. Karoly and Constantijn W.A. Panis, *The 21st Century at Work: Forces Shaping the Future Workforce and Workplace in the United States*, MG-164-DOL, 2004, 301 pp., \$30, ISBN: 08330-3492-8., available from RAND Distribution Services (phone: 310-451-7002; toll free: 877-584-8642; or email: [order@rand.org](mailto:order@rand.org)). View this document at <http://www.rand.org/publications/RB/RB5070>. The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors. RAND® is a registered trademark.