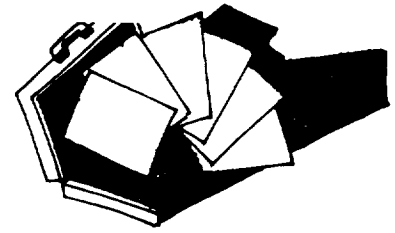


Conference Papers



Productivity and employment: the 1988 international symposium

HORST BRAND

Sponsored by the U.S. Department of Labor on the occasion of its 75th anniversary, an International Productivity Symposium, the third in 5 years, was held in Washington in April 1988.

The first of the three symposia had been sponsored by the Japan Productivity Center. Held in Tokyo in the spring of 1983, it had as its theme "Revitalizing the World Economy Through Improved Productivity." The second symposium met in Munich in the fall of 1986 under the auspices of Rationalisierungs-Kuratorium der Deutschen Wirtschaft, the German productivity organization which is a member of the European Association of National Productivity Centers. Here, the theme was "Productivity and the Future of Work."

The third International Productivity Symposium examined "Productivity and Employment." The symposium was attended by 650 participants from 28 countries, including 118 representatives from Japan alone. In addition to opening and concluding plenary sessions, at which the social and economic setting of productivity was discussed, the symposium was organized around three sets of panels, addressing (1) employment strategies; (2) organizational strategies; and (3) industrial relations strategies. "Strategies" were defined as ways of dealing with rapid technological change amidst growing international competition.

The employment panels dealt with employment policies, demographic effects, and educational and training responses dictated by technological change. The panels on organizational matters discussed changing forms of work design and work organization, and changes in work

schedules. They also featured case studies. The panels on industrial relations discussed changing roles of management and trade unions, changes in compensation and reward systems, and related matters. This report presents some of the highlights of the latest symposium.¹

U.S. Secretary of Labor Ann McLaughlin set the tone of the 1988 meetings by emphasizing the importance of the quality of labor in productivity growth:

Since 1929, the majority of this country's productivity improvements—and most of our growth in national income—have been directly linked to increased labor quality through education, training, and health care; and to the reallocation of labor through retraining.

By comparison, over the same period, machine capital has contributed a disappointing 20 percent, or less, to productivity. Clearly, machinery and technology alone don't improve productivity. People do.

The Secretary emphasized the need for labor force participants to continue their education beyond high school, and noted the probability of a "skills gap" in the future, as a shortage of skilled workers results, at least in part, from unfavorable demographics. She chided managers who cite workers as the chief culprits in causing quality problems. "Workers are not part of the problem. They're the source of the solution," she said, noting a number of examples of successful worker involvement in quality improvement.

Preparing for change

An analytical foundation for the symposium was provided by Janet L. Norwood, Commissioner of the U.S. Bureau of Labor Statistics. Norwood briefly reviewed what she held to be the central issues of adjustment to the changes in economic conditions now underway, stressing that not only working people but employers as well are being compelled to adjust. The issues she noted included new technology, foreign competition, economic and corporate restructuring, and a prospective rise in the rate of productivity growth. In her talk, she focused upon the recent and projected changes in the age and sex mix of the U.S. labor force, and what these changes signify for the Nation's productivity trend.

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Dramatic increases in the country's labor force had occurred during the 1970's. Women, particularly married women, entered the work force in large numbers, and the teenage labor force rose at a nearly 5-percent annual rate. At the same time, close to 19 million new jobs opened up. The 1980's witnessed a more steady labor force expansion. While two recessions marked the early part of the decade, and the unemployment rate rose, the female labor force participation rate continued to increase, especially among women ages 25 to 34. Now, near the end of the decade, both partners hold jobs in one-half of all husband-wife families. By the year 2000, Norwood believes, some three-fifths of all women of working age are likely to be in the labor force. And the average age of workers will keep rising to the end of the century and beyond.

The effects of the changing age-sex structure of the labor force on productivity are likely to be positive, particularly if employers take account of child care and other family needs which both female and male workers must increasingly confront. Women will be better educated and more experienced; a growing proportion of them will hold technical and professional positions. Workers generally will be more mature, more committed, and may even wish to work more, rather than fewer, hours (recent surveys confirm this development).

Family stress, however, seems likely to intensify as more wives join their husbands in the labor force. Absenteeism may well increase unless employers deal with such stress issues. Many of them already recognize this, Norwood said: 60 percent of all establishments with 10 employees or more offer flexible work schedules; one-third permit part-time work; and 15 percent permit job sharing. In sum, companies of all sizes ought to reconsider their scheduling practices in light of the changing sex composition of the labor force, and the family (or stress) issues this presents.

Some panelists struck a cautious note concerning future productivity growth. Thus, John Martin of the Organization for Economic Development and Cooperation (OECD), broadly agreed with Norwood that favorable labor force demographics would likely promote productivity growth over the longer term, that broader employment opportunities would facilitate worker adjustment to economic change, and that rising spending for research and development foreshadows an improved productivity trend rate. He expressed concern, however, about the continued weak growth in total-factor (labor, capital, and other inputs) productivity, noting that while the trend for all OECD countries for the years 1960-73 averaged 2.9 percent per year, it slowed to 0.7 percent for the years 1973-79, and to 0.6 percent for 1979-85. The persistence of the slowdown, he thought, was all the more puzzling in view of the large investments during the last two decades in information-intensive technologies, especially in trade and finance. Only a small part of the slowdown can be

explicitly accounted for, he said—it may be partially attributable to a return to earlier trend patterns. At any rate, if the record of the recent past can be taken as a guide, then the outlook for strong gains in productivity is not bright. Hence, economic growth will be retarded, and living standards will improve much more slowly than in earlier periods.

Sketching likely employment effects

Sharply divergent points of view emerged concerning the employment effects of productivity growth, and the strategies to deal with them. Before some pertinent details are sketched, it should be noted that employment problems were discussed in terms not only of the direct effects of productivity and technological change but also of "restructuring," compelled by competition and the "globalization" of the U.S. economy. (Few panelists attempted to separate technological change and the resultant productivity gains from other factors impinging upon employment.)

Albert Rees, president of the Alfred P. Sloan Foundation, asserted that economic policy in the United States has in some respects changed over the last two decades: high unemployment rates have become politically more tolerable, unemployment compensation laws have become more restrictive, and the proportion of unemployed workers receiving such compensation has shrunk. However, the conventional business policy of laying off workers when demand slackens or when cost reduction becomes mandatory has not been modified, he said. In fact, insecurity of employment, a fact of life for blue-collar workers, has been rapidly extending to white-collar workers as well. Shorter hours on part-time schedules are unlikely to be widely accepted in industry, inasmuch as they have not traditionally been part of industrial relations in the United States.

Rees' thoughts were, in a sense, corroborated by the views offered by Frank Doyle, senior vice president of General Electric Co., as well as by Nathaniel Semple, vice president of the Committee for Economic Development (CED). Doyle in effect attributed the problem of slowed productivity growth to companies having been burdened by too many people, too many systems—and in so defining the problem, he implicitly defined its solution, at least within a company framework. The problem of import competition, which intensified during the early to mid-1980's because of the overvalued dollar, has become a fact of life in U.S. markets, particularly those for consumer products. Companies such as his, Doyle said, have thus been compelled to move production facilities offshore, to take advantage of the lower labor costs and organizational streamlining they need to remain cost-competitive in the U.S. and world markets.

Semple similarly portrayed the rigors of competitive pressures that business has confronted. To survive in today's volatile global markets, business must be able to reallocate resources quickly, and have maximum freedom to change technologies, plant location, and work conditions, including the rationalization of work organization, Semple maintained. He acknowledged the "destabilizing" effects such actions may have on workers—blue-, white-, and pink-collar—but saw no alternative.

Trade union representatives were troubled by just these human consequences of intensified competition, and the structural changes it already has brought about. Thus, Morton Bahr, president of the Communications Workers of America, pointed to the downgrading of tens of thousands of telecommunications workers after the breakup of American Telephone & Telegraph Co. in 1984. Sheldon Friedman, research director of the United Auto Workers, cited the recent BLS study on dislocated workers,² and discussed what he considered the poor corporate and government response to the problem. He noted that, between 1981 and 1986, 2 million workers had lost their jobs due to plant closings and mass layoffs, and that half of these workers remained jobless for more than 6 months. Friedman also stressed the income losses suffered by these workers when reemployed—losses that averaged 16 percent, and for one-third of them, more than 25 percent. At the same time, he said, Federal expenditures for employment and training have declined by 68 percent (in constant dollars) since 1978, so that activities under the Job Training Partnership Act (1982) have been so underfunded that only 5 percent of dislocated workers have been served.

Business generally has been likewise unresponsive to the dislocated worker problem, Friedman suggested. He cited a report by the U.S. General Accounting Office,³ according to which only about 1 in 10 blue-collar workers gets 90 days advance notice of plant closings or of mass layoffs; over the study period, the average for prenotification was 10 days. Severance pay was offered by only 44 percent of companies, and job search assistance by 30 percent. On the plus side, Friedman mentioned the Tuition Assistance Plan negotiated by his union and General Motors Corp., under which 12,000 laid-off workers each receive \$5,500 toward retraining for new careers.

In sum, representatives of labor and management agreed that productivity gains resulting from restructuring incident to sharpened competition in global and domestic markets might well cause employment losses.

Productivity gains from new technologies, however, were less likely to cause such losses. David Mowery, study director of the Panel on Technology and Employment at the National Academy on Engineering, argued that the combination of advancing technology and rising productivity has been associated historically with rising employ-

ment. ". . . [Reductions] in labor requirements per unit of output resulting from new process technologies have been and will continue to be outweighed by the beneficial employment effects of the expansion in total output that generally occurs."⁴

However, the favorable employment effects of technological advance have become conditioned upon the rapidity with which U.S. firms adopt and adapt to them, as well as the speed with which the innovations generate new knowledge. Lack of flexibility in these respects is likely to lead to employment losses, Mowery warned. He also stressed that the rate of technology transfer across international borders is accelerating, thus diminishing or altogether eliminating technology gaps between countries.

Notwithstanding the pressures to adjust to these relatively recent technological changes, the diffusion of new technology is likely to be gradual, thus easing adjustment of workers displaced by it. Moreover, retraining requirements posed by new technologies are not overly complex, Mowery stated. Job-related skill levels are unlikely to change very much. What workers need are strong basic skills—numerical reasoning, modest problem-solving abilities, literacy, and ability to communicate. Twenty to thirty percent of today's work force lacks some or all of these skills. Inasmuch as 75 percent of the current labor force still will be employed in the year 2000, intensive retraining efforts are a necessity.

Labor representatives took contradictory positions regarding the job effects (as opposed to the employment effects) of the new technologies. Bahr pointed to their oppressive potential, as when workers in telecommunications are closely monitored so as to ensure brevity in their responses to customer requests. While acknowledging that workers' basic skills do need upgrading, Bahr also held that, because the new technology extends brain power rather than brawn power, computer information systems tend to deskill rather than enhance job-related abilities.

By contrast, Karl Tapiola, director of the Confederation of Finnish Trade Unions, emphasized that the dependence of many production processes upon information technology that workers must master often enables employees to take a broader view of their work, and to have greater command over it. He stressed, however, that the required educational levels, the control over one's work, and the career opportunities that become available, are limited to but a minority of employees, a possible elite of workers—leaving a larger, second-class work force, the victims of "flexibility." To counteract such polarization, Tapiola proposed reductions in wage differentials, and called for resistance to discrimination against women, who traditionally were relegated without recourse to poorer-paying, low-status jobs.

Tapiola also dealt with issues of industrial relations that bear upon the productivity-enhancing effects of employee

participation in decisions that affect organizational operations. It is true, he said, that employees increasingly influence decisions about their immediate work conditions, but it is not true that they are helping to make the more fundamental strategic decisions that affect them. Management usually does not air questions of financing, research and development, and plant location and relocation within or beyond national borders with employee representatives. Tapiola urged consultative and exchange-of-information arrangements between trade unions and central management, at domestic and international levels, as well as continuous upgrading of labor standards and careful monitoring to prevent their erosion.⁵

Here, areas of tension between labor and management representatives once again could be perceived. Semple did propose labor-management communications programs (at a panel other than the one of which Tapiola was a member), focusing on the improvement of firms' market positions. But his advocacy of employee involvement as a means to productivity improvement was clearly confined to issues directly related to the work itself. He also advocated a shift away from fixed compensation in favor of flexible compensation structures which would link pay and benefits to profitability, and thus give employees a greater stake in a firm's performance. Such a practice might, of course, clash with the wage and labor standards policies which Tapiola urged.

There also were areas of agreement among symposium participants. Like the trade union spokespersons, Semple strongly favored notifying workers in advance concerning decisions affecting jobs—such as plant closings, work transfers, and automation. Also, he advocated that affected workers be supported with orderly job-transfer programs, whether inside or outside companies, as part of private-sector adjustment policies.

The worker's role

As indicated earlier, worker participation in decisions about work processes and the restructuring of work organization was one of the three themes of the symposium. Here, again, the discussion ranged far beyond the productivity effects. Advocacy of worker participation in organizational decision making had its inception at a time of profound changes in worker attitudes and the character of the labor force—the social unrest and widespread strikes that occurred in several industrialized nations between 1968 and 1971 being viewed as the onset of those changes. Thus, Roger Holtback, chief executive officer of the Volvo Corp., traced the shift during the early 1970's from assembly lines to small-team organization in building cars at his firm's Kalmar (Sweden) plant to the increasing difficulty of finding workers to staff assembly lines, rather than to considerations of higher output per hour (although this happened to be a result of the shift).

The Volvo assembly line—which itself had led to the breakdown or fragmentation of the worker craft organizations that had originally built the automobile—was replaced by small teams of about 20 workers, each charged with full responsibility for one of the systems (currently numbering 21) that make up a car—electrical, brake, instrument panel, and so forth. The work cycle has been lengthened so that the repetitiveness of given operations has been reduced to as little as one-tenth of what it had been on the assembly line. Corrections to finished work have been reduced by 40 percent.

The Volvo workers are trained in computer technology. The apprentice-journeyman system having been reintroduced, workers are regarded as being highly skilled, thus enhancing their self-esteem. Absenteeism and turnover are low, fewer health problems have arisen, and the age-sex mix of workers has become more broadly representative.

While Holtback's report, like other case studies presented at the symposium, summarized experience gained in manufacturing industry, another presentation dealt with a public service industry—here, the maintenance and repair of the New York City Department of Sanitation's truck fleet, with Ronald Cantino, deputy commissioner of the Department, reporting.

According to Cantino, one-half of the Department's 5,100 vehicles were out of service on an average daily basis as of late 1978, mostly because of ineffective management practices and poor use of labor resources. Large amounts of overtime had to be worked to ensure a modicum of daily sanitation services. Cantino, whose Bureau of Motor Equipment operates out of 73 locations scattered throughout the city, perceived that poor labor-management relations lay at the core of the problem. He proceeded to involve his employees and their union directly in all work-related decisions, focusing on raising efficiency. His guiding idea was that a pool of skills and knowledge existed among the work force of his bureau, which workers did not (or would not) share with an indifferent, often even callous, management.

The chief instrument devised by Cantino to gain the confidence and cooperation of the work force was a Labor Committee, consisting of the bureau's top staff and trade union and shop representatives. The committee was to report weekly to Cantino. Committee members were free to report all decisions to the trade union leadership.

The chief initial concern of the committee was not productivity improvement so much as working conditions, and this orientation gradually led to employees' perception that they were gaining control over their daily work lives. Pride in workmanship revived, and suggestions to make the job more efficient multiplied. Eventually, a system of 22 committees was set up to facilitate productivity improvement, the evaluation of the feasibility

ity of their specific suggestions being left to a specialized analyst.

Cantino also discussed the difficulties encountered with managers. Although the organizational structure of the motor equipment bureau was left in place, managers still resisted implementing many of the suggestions made by rank-and-file workers. Where managers proved unable to adapt, they were transferred, and replaced by persons trained in the worker participation system that Cantino had installed.

In addition to institutionalizing worker involvement in productivity change, a "profit center" concept was actuated, under which the cost incurred in repairing or replacing a given vehicular part (or in performing a given service) was compared to the cost of contracting out or purchasing from an outside company. The bureau's shops often were shown to outperform private contractors. Moreover, productivity improvements were thus transformed into readily understood dollars-and-cents terms, bolstering pride of workmanship and interest in the work.

The Japanese speak

Panelists representing Japanese business, labor, and government differed in orientation and emphases from their counterparts from other industrialized countries, reflecting national differences in employment policies, industrial relations, and work organization, as well as different long-term prospects brought on by radical changes in currency exchange values and their impact on Japanese industry.

Some of the Japanese speakers noted the U.S. origins of their economy's productivity growth over the postwar period. Thus, Masao Kamei, chairman of Sumitomo Electric Industries, cited the British productivity mission's report on its experience in the United States in the early 1950's, entitled *We Too Can Prosper*,⁶ as having greatly encouraged members of Japanese business circles to proceed with their own industrial buildup. Between 1955 and 1961, Kamei reported, Japan sent 459 teams with 4,403 members to the United States and Europe to learn about management techniques, manufacturing technology, workshop control, and labor-management relations. The teams published their reports upon their return, and these reports, being widely disseminated, very much contributed to revitalizing Japanese industry.

The Japanese "productivity movement," as described by Kamei, arose in the 1950's. It was based on the principles of labor-management cooperation and the recognition of workers' rights by management. Rising productivity was to generate rising employment over the longer term, and it was not to be left to the market alone to achieve this relationship. (As other Japanese panelists made clear, it also meant that no layoffs would occur because of technological advances.) Methods for productivity improvement were to be studied

and introduced in consultation with labor, the policy of "zero defects" and quality circles being among the results of such consultation.

Nobuo Kudo, managing director of the Japan Industrial Journal; Jinnosuke Miyai, president of the Japan Productivity Center; and Kannojo Kataiwa, acting president of the Federation of Electric Power Unions of Japan all confirmed that labor markets in Japan have been internal (to the firm) rather than open, that flexible personnel policies have rested on intracorporate transfers, and that management ordinarily has not felt free to lay off or dismiss workers. The seniority principle in wage and salary scales has been rather strictly adhered to, its premise being that length of service indicates degree of employee ability and vocational aptitude, reinforced by in-house training and retraining. Thus, Japanese management makes an "invisible investment" in its employees; employee experience and know-how in company-specific skills become management's "invisible assets," as one of the speakers pointed out. Much of the superior performance of Japanese business is attributable to this personnel system, the panelists believed.

Professor Tadao Kagono of Kobe University discussed additional features of this system—and he also outlined its limits. What he called the "paradigms of Japanese management" during the postwar period have been these:

- Motivate and commit your employees;
- Minimize status differences (Kagono stated that the highest salaries in Japanese corporations averaged 7.5 times the lowest)⁷;
- Minimize the number of separate job classifications;
- Spur internal mobility in the interest of skill versatility;
- Share all information with other managers and with employees and their representatives;
- Remember that implementing strategy is more difficult than formulating it;
- Share the fruits of productivity.

Japanese management overwhelmingly believes that its foremost obligation is to its employees rather than to shareholders, Kagono said. He believes that U.S. executives are too preoccupied with shareholder interests. It has been shareholder interests that have made for the recent waves of mergers and acquisitions; employees' equity in their job and in company-specific training has been almost entirely disregarded. If participative management is to be successful in the United States, shareholder powers must be curbed.

Kagono then discussed some of the limits of the Japanese management system; here, his thoughts were shared by some of the other Japanese panelists. Participative management works best in industries with assembly-line types of technology, where innovative production processes and new products are key success factors—for

example, automobiles, machinery, and computers. These are industries whose competitive positions have been strongly and adversely affected by the rising exchange rate of the yen. Intensive cost-cutting efforts have, to an extent, offset that disadvantage—only to contribute further to the Japanese trade surplus and hence the rising value of the yen. Therefore, to optimize productivity in these industries means to globalize them, most often by moving production facilities to other countries. That, in turn, spells a narrowing of the ambit of the participative management characteristic of Japanese organization.

Certain other Japanese manufacturing industries—steel and shipbuilding, in particular—are being compelled to “restructure” because of international competition. Their work forces must be reduced, and this goes against the grain of the Japanese tradition of no layoffs. Many other industries—food, chemicals, aerospace, agriculture—remain competitively weak but also cannot be restructured without giving up or greatly modifying time-honored management practices. The service sector, Kagano said, represents a newly emerging paradigm; here, greater priority is given to the hiring of younger workers, job classifications are often more detailed than in manufacturing, and compensation structures tend to reflect merit rather than seniority.

Miyai, of the Japan Productivity Center, further elaborated on the changes the industrial relations system in Japan will undergo. Contract labor, part-time work, and temporary hiring of professional and semiprofessional workers are becoming more prevalent. Retraining and reemployment of workers within the same enterprise is becoming more difficult. Thus, declining industries employ large numbers of redundant workers. Unemployment is not now a serious macroeconomic problem in Japan, but mismatches of employment on a regional or age basis are becoming more frequent. Job problems also arise from the increasingly permanent attachment of women to the labor force; the growing inability of agriculture to absorb redundant labor as international trade in agricultural products is liberalized; the stepped-up rationalization of services and distribution; office and plant automation; and the shift of economic activities to overseas locations. It was evident from such presentations as Kagono's, Miyai's, and Kamei's that Japan confronts profound changes in its employment and industrial relations structures, and that there is great uncertainty as to how these changes can be met without giving up traditions and conventions that have underlain her social stability and economic strength.

Summing up

In concluding the symposium, C. Jackson Grayson, chairman of the American Productivity Center, discussed the reasons why the growth of U.S. productivity has

slowed, and how the Nation's management must respond to reinvigorate it.

Macroeconomic policy solutions are no longer as effective in promoting productivity growth as they were in earlier postwar decades, he said. Nor will currency manipulation spur such growth, except over a short period.

Protectionism does not work, and so-called industrial policies are not very effective. In general, the belief that government can act as an engine of productivity advance is not well founded.

There is a more fundamental difficulty, Grayson asserted. The United States, like Great Britain and the Netherlands in earlier periods, has been a productivity growth leader. But leaders become complacent. Challengers copy them, adopt and adapt their ideas, work harder, pay more attention to education and training. Challengers are protectionists rather than free traders. Over time, economic leaders have trouble adjusting—their challengers are flexible. True, the United States still leads in terms of the level of productivity, but lags far behind in terms of productivity growth.

U.S. management must recognize and respond to the “economic tectonics” of global competition, Grayson warned. It must realize that production has become globalized, technological transfer has accelerated, and comparative advantage for a host of products is shifting rapidly among nations. It must adjust its practices to account for the rising importance of human capital, the growing emphasis on quality, and the rapid “commodification” of innovations and inventions. It must organize for flexibility. Grayson listed 10 areas upon which productivity improvement must focus:

- Quality;
- Design of operating systems;
- Job design and organizational structures;
- Accounting systems;
- Employment security;
- Compensation and reward systems;
- Worker involvement;
- Investment in employee training;
- Elimination of status symbols;
- Trade union involvement in organizational decision-making.

The globalization of the U.S. economy, Grayson said, requires much more and much better international data, tailored for ready international comparability, by levels as well as by trend rates. He mentioned specifically the need for estimates of gross domestic product per capita, employment, and hours worked, each by nation, sector, and industry. He also called for improvements in the purchasing power parity method of converting exchange rates.⁸

Grayson's greatest concern remained with productivity growth. It determines a nation's rank in the global economy. It bridges macro- and micro-economic concerns. Notwithstanding his reservations about government intervention in matters economic, Grayson advocated a Marshall Plan for the poor nations, to be driven by productivity improvements. By the year 2100, he said, the Third World will account for 90 percent of the world's population. A world with a handful of rich nations and a vast majority of poor nations cannot survive peacefully. Productivity is the way out—a way to freedom.

The tension between productivity and employment, openly acknowledged by few speakers but implicit in most of the presentations, was thus more directly addressed by Grayson in his call for a vast expansion of global markets. And this recalled a note struck by Stephen Schlossberg, director of the Washington office of the International Labor Organization, at the beginning of the symposium: the United States and other industrial countries cannot prosper in the 21st century unless they open up new markets in developing nations. Schlossberg offered the International Labor Organization as a model for the tripartite action by employers, workers, and government. The statements by Grayson and Schlossberg essentially shifted responsibility for the solution to the productivity dilemma to the political arena, perhaps the most fitting summation for the symposium. □

—FOOTNOTES—

¹A summary of the symposium proceedings will be available at no cost in the early fall of 1988 from the Office of Labor Management Standards, U.S. Department of Labor.

²See Francis W. Horvath, "The pulse of economic change: displaced workers of 1981–85," *Monthly Labor Review*, June 1987, pp. 3–12. See also Paul O. Flaim and Ellen Sehgal, "Displaced workers of 1979–83: how well have they fared?" *Monthly Labor Review*, June 1985, pp. 3–16; Richard Devens, "Displaced workers: one year later," *Monthly Labor Review*, July 1986, pp. 40–43; and U.S. Congress, Office of Technology Assessment, *Technology and Structural Unemployment: Reemploying Displaced Adults*, OTA-ITE-250 (Washington, Government Printing Office, February 1986).

³See "GAO's Preliminary Analysis of U.S. Business Closures and Permanent Layoffs During 1983 and 1984, Apr. 30, 1986" (Washington, U.S. General Accounting Office). See also *Plant Closings: Information, Advance Notice and Assistance to Dislocated Workers*, GAO-HRD 87–86 BR (Washington, U.S. Government Printing Office, Apr. 17, 1987).

⁴Richard M. Cyert and David C. Mowery, eds., *Technology and Employment. Innovation and Growth in the U.S. Economy, Executive Summary* (Washington, National Academy Press, 1987), p. 2. See also Jerome A. Mark, "Technological change and employment: some results from BLS research," *Monthly Labor Review*, April 1987, pp. 26–29.

⁵See *World Labour Report*, vols. 1 and 2 (Geneva, International Labour Office, 1984).

⁶Graham Hutton, *We Too Can Prosper. The Promise of Productivity* (London, George Allen & Unwin, 1953).

⁷According to calculations by Lester Thurow, the after-tax income of the top 20 percent of income recipients in Japan averaged 5.2 times that of the bottom 20 percent for the years 1960–77; in the United States, it was 9.5 times. See Thurow, "Equity, Efficiency, Social Justice, and Redistribution," in Organization for Economic Cooperation and Development, *The Welfare State in Crisis* (Paris, 1981), p. 138.

⁸For a description at purchasing power parities, see John Dryden, Katrina Reut, and Barbara Slater, "Comparison of purchasing power parity between the United States and Canada," *Monthly Labor Review*, December 1987, pp. 7–24.

Consumer Expenditure Survey conference paper summaries

Economists in the Bureau of Labor Statistics' Division of Consumer Expenditure Surveys and Division of Price and Index Number Research analyze Consumer Expenditure data in a variety of ways. The following are summaries of this research that were presented at various professional conferences during 1987 and 1988. To receive a full copy of one or more of the papers, write the author, care of Bureau of Labor Statistics, 600 E Street, N.W. (4th floor), Washington, DC 20212.

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Thesia I. Garner, "Consumer Expenditure and Inequality: A Budget Components Analysis Using the Gini Coefficient," presented at the Southern Economic Association Meetings in Washington, DC, November 22–24, 1987.

In this paper, the material well-being of the population, as defined by consumption expenditures, is evaluated in terms of the inequality of consumption expenditures across consumer units representative of the U.S. urban population in 1982–83. The Gini coefficient is used as the measure of inequality: the higher the Gini value, the greater the inequality. Gini coefficients are produced for all consumer units as a group and for socioeconomic and demographic subgroups of the population. The Gini coefficient is decomposed by budget components to examine the effects by component on overall consumption expenditures inequality. The Lerman and Yitzhaki covariance method is employed to calculate Gini estimates; these estimates are more accurate than would have been possible with other methods, because microlevel, and not grouped, data are required.

An overall Gini value of .322 results from a population estimate of inequality based on consumption expenditures. This is comparable to, although slightly lower than, estimates based on income. Differences among subgroups of the population are examined. The most inequality in expenditures is experienced by one-person consumer units, consumer units with reference persons age 65 or