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United States of America: Selected Issues

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INTERNATIONAL MONETARY FUND

UNITED STATES OF AMERICA

Selected Issues

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Approved by the Western Hemisphere Department

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I. Does the Pickup in Productivity Growth Mean that there Is a "New Economy? "[1]

1. Strong economic growth combined with low inflation and a pickup in labor productivity growth has led many observers of U.S. economic conditions to proclaim the existence of a "new economy" in the United States. In general terms, the adoption of new technology and globalization are seen as changing the underlying economic relationships in the economy so that continued strong growth and low inflation are possible.

2. From an international perspective, the production and use of information technologies (IT) are most pronounced in the United States.[2] In 1997, the United States accounted for nearly one-third of world IT goods production, with Japan accounting for about a quarter, and the European Union accounting for about 20 percent.[3] The IT sector in the United States accounts for a larger share of GDP than in most other industrial countries (Figure 1). The United States has also ranked first in IT spending as a share of GDP compared to other major industrial countries over the period 1992–97, although more recently Japan has begun to catch up (Figures 2 and 3) .

3. Given the United States' lead role in producing and consuming information technologies, considerable attention has recently focused on identifying whether a link can be established between IT and sustained productivity growth in the United States, and whether the U.S. experience offers lessons for other industrial countries as their IT sectors develop further. Although recent U.S. empirical evidence establishes a link between IT and the pickup in labor productivity growth in the second half of the 1990s, it remains premature to conclude that a "new economy" exists.

A. What is the "New Economy?"

4. Despite the amount of attention that the term "new economy" has received, there is little consensus on what is now different about the U.S. economy and whether such a difference has fundamentally changed the way in which the economy works. The range of

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[1] Prepared by Paula R. De Masi.

[2] Although the precise definition of IT varies, it typically includes semiconductors, computer systems, electronic storage devices, printers, data communication equipment, software, and telecommunication equipment and services. For a detailed description, see OECD (2000).

[3] Among the European Union countries, the United Kingdom accounted for 4.2 percent, Germany for 3.9 percent, France for 3.5 percent, and Italy 1.8 percent of worldwide production of IT goods.

interpretations on what constitutes the "new economy" can be organized into three different but related categories:[4]

- *The long-run growth view.* In this interpretation of the "new economy," higher long-term growth is achieved owing to a permanently higher growth rate in productivity that stems primarily from the adoption of and continued innovation in IT, as well as from the effects of globalization and deregulation. Empirical evidence suggests that there is a link between using and producing computers and the pickup in labor productivity in the second half of the 1990s.[5] However, based on available data, it is not possible to conclude as of yet whether or not the shift to higher productivity *growth* is sustainable. The substantial increase in productivity associated with IT experienced in recent years may simply represent a one-time transition to a higher *level* of productivity because of a major change in technology. This can be considered an "old economy" process, in the sense that it represents the traditional process of development, adoption, and diffusion of new technologies.

- *The positive feedback view.* In this view, the "new economy" is characterized by a pickup in *total factor productivity* growth across many sectors based on the adoption of IT, which results in increasing returns to scale, other network economies, and positive spillover effects. In other words, investment in IT in one firm improves the productivity of other firms as they are able to work together more efficiently. Although there is anecdotal evidence, to date, there is little solid empirical evidence that such positive feedback effects across industries are more important and pervasive now than in the past.

- *The resource utilization view.* This version of the "new economy" is based on the observation that during the recent expansion unemployment has declined below most estimates of NAIRU without spurring inflation, implying that NAIRU must have declined. It is argued that inflationary pressures in the United States have remained subdued because of globalization (domestic firms have faced increased competition from less-expensive imported goods) and IT, which has increased productivity and efficiency.[6] Because actual productivity is increasing faster than what workers perceive, wage demands are muted, and it appears as

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[4] For a more detailed discussion of the varying interpretations of the new economy, see Stiroh (1999) and Meyer (2000).

[5] For a survey of recent evidence, see Oliner and Sichel (2000).

[6] For example, because of better access to information, IT allows firms to improve inventory management, which reduces uncertainty and the cost of production. In addition, new capacity can be brought on line with shorter lead times owing to the ways in which IT has helped to streamline the design and delivery process.

though the NAIRU has declined.[7] Accordingly, labor and other utilization rates can be higher without triggering inflationary pressures. At present, however, it is extremely difficult to disentangle whether the decline in NAIRU is permanent or simply related to temporary factors, such as the period of time it takes for workers to incorporate higher trend productivity into wage demands. In addition, positive supply shocks—for example, the past weakness in commodity prices, the strength of the U.S. dollar, and restrained health care costs—may have temporarily reduced inflationary pressures, but have not changed any of the underlying relationships in the economy.

B. U.S. Evidence on the Link Between IT and Productivity

5. Spending on information processing equipment and software has grown at a rapid pace (Table 1). In the second half of the 1990s, spending on computers and peripheral equipment surged to an average annual rate of about 46 percent. As a result, information-processing equipment and software as a share of GDP (in real terms) rose to about 5¾ percent in 1999, from less that 1 percent in 1970. The contribution of IT capital to output growth increased to about 1.1 percentage points for the period 1996–99, from about 0.6 percentage point during 1991–95.[8]

6. These strong rates of investment were in part driven by sharp declines in prices for computer equipment. In particular, over the period 1995–99, the prices for computers and equipment plunged by 24 percent, while prices in the overall economy—as measured by the GDP deflator—increased by 1.6 percent.[9] The computer price deflator takes into account the improved qualities and performance of computers over time, and is therefore a measure of the ratio of price to performance.

7. The rapid adoption of IT has been widely credited as being the driving force behind the acceleration in labor productivity that took place during the 1990s (Table 2, Figure 4).

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[7] For a more detailed discussion, see Blinder (2000), and Council of Economic Advisers (2000).

[8] Oliner and Sichel (2000). Average annual output growth was 4.8 and 2.8 percent during the periods 1996–99 and 1991–95, respectively.

[9] Over the period 1970–99, prices for computers and equipment declined at an average annual rate of 16 percent. The average annual decline in the price deflator for software is notably much smaller (see Table 1). It may well be the case that the official price indexes used to deflate software investment do not fully capture quality improvements. Moulton, Parker, and Seskin (1999) note that only price indexes for prepackaged software are based on hedonic methods which take account of quality improvements. In contrast, prices for business own-account software are based on input-cost indexes which assume no gains in productivity.

Several recent studies conclude that both the ***production*** and ***use*** of IT have made a significant contribution to labor-productivity growth.[10] While technological change has been integral to the acceleration in productivity growth, it is important to emphasize that this has occurred through the familiar "old economy" process, rather than "new economy" spillover effects. Greater efficiencies achieved in producing computers and semiconductors have boosted total factor productivity (TFP)—and hence labor productivity—in these sectors, as evidenced by the plunging prices of their products. These price declines encouraged other industries to raise their investment in IT assets, contributing to capital deepening and further boosting labor productivity. Together, the impact of producing and using IT accounts for an estimated 45 to 75 percent of the acceleration in labor productivity during the second half of the 1990s (Table 3). To sustain higher productivity growth, however, further technological change and the adoption of these newer technologies would be required.

8. Computer and semiconductor production have played an important role in explaining the acceleration in labor-productivity growth. This effect is illustrated by the recent pickup in TFP growth for the economy as a whole which is estimated to have increased to about 1¼ percent during the period 1996–99, up from about 0.5 percent over the period 1991–95.[11] Oliner and Sichel (2000), Jorgenson and Stiroh (2000), and other authors find that stronger TFP growth explains about 70 percent of the pickup in labor productivity growth in the second half of the 1990s. In particular, although the computer and semiconductor sectors account for only about 2¼ percent of the economy's output, these sectors contributed about one-third of the stronger growth in TFP.

9. Capital deepening associated with the use of information technologies also has made an important contribution to the pickup in labor productivity growth. For example, Oliner and Sichel (2000) find that about 50 percent of the acceleration in labor productivity is attributable to investment in IT capital, whereas other capital made no contribution.[12] Jorgenson and

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[10] The distinction between the production and use of IT is based on the relationship that the growth in labor productivity is based on capital deepening, improvements in labor quality, and total factor productivity growth. For a detailed discussion, see Jorgenson and Stiroh (2000).

[11] The TFP estimates are from Oliner and Sichel (2000). The official TFP data are published by the Bureau of Labor Statistics, but 1997 is the most recent year for which data are available.

[12] IT capital is defined to include computer hardware and software, and communication equipment.

Stiroh (2000) also find that capital deepening has contributed to the acceleration in labor-productivity growth, although the increase in TFP growth contributed a larger share.[13]

10. To further understand TFP growth, Jorgenson and Stiroh (2000) extend their analysis by calculating industry contributions to aggregate TFP growth (Figure 5).[14] The results reveal that over the period 1958–96, a broad range of industries contributed to an average annual rate of TFP growth of about 0.5 percent, with trade, industrial machinery, and electronic equipment making the largest contributions. Although the growth rate of TFP in the trade industry was about 1 percent per year, it makes the largest contribution because of the relative size of the industry. In contrast, despite their relatively small size, the industrial machinery and the electronic equipment sectors make large contributions because of increases in TFP in both industries of 1.5 and 2 percent, respectively. It is noteworthy that nine industries made a negative contribution to TFP growth, including services. TFP measures for services tend to be biased downward because output is difficult to measure.[15] Typically, output is measured as the real value of the inputs used. While this may be an appropriate assumption in some sectors, in others where substantial innovation is occurring (for example, banking, medical care, and consulting services), productivity is clearly biased downward. Limitations in measuring output may potentially mask significant improvements in productivity.

11. As an alternative approach to understanding the pickup in labor-productivity growth, Gordon (1999, 2000b) focuses on separating trend from cyclical labor-productivity growth, and then determines the extent to which IT has affected trend-productivity growth (see Table 3). Gordon emphasizes that when real GDP grows at a faster rate than potential, as has been the case for the last four years, labor productivity tends to accelerate because firms' existing labor forces are worked more intensively.[16] He estimates that of the observed

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[13] Oliner and Sichel (2000) explain that the difference in their results and those of Jorgenson and Stiroh's relate to the latter's: (i) use of a broader concept in defining output, which includes imputed service flows from owner-occupied housing and consumer durables, and (ii) assumption that capital becomes productive with a lag, rather than immediately, which decreases the estimated size of the capital stock.

[14] The methodology employed by Jorgenson and Stiroh (2000) establishes a growth accounting equation for each industry, and then using "Domar weights"—that is, industry gross output divided by aggregate value added—links the industry TFP growth to aggregate TFP growth, so that aggregate TFP growth is expressed as a weighted average of industry TFP growth.

[15] For a detailed discussion of productivity growth at a disaggregated level, see Corrado and Slifman (1999).

[16] This suggests that the hours worked data used to measure labor input does not accurately reflect work effort over the business cycle.

1.4 percentage point acceleration in labor productivity growth over the period 1972–95 to 1995–99, 0.5 percentage point can be attributed to a cyclical increase, leaving a 0.8 percentage point increase in trend labor-productivity growth. Gordon finds that about half of the increase in trend labor productivity is accounted for by increases in labor quality and capital deepening and the remaining half is attributable to total factor productivity. Like other authors, Gordon finds that TFP in the computer and semiconductor manufacturing sector increased, but he finds no evidence that TFP increased elsewhere in the economy. Therefore, Gordon concludes that capital deepening has contributed to a pickup in labor-productivity growth even outside of the computer sector, but that there has not been an economy-wide trend increase in total factor productivity growth, which would be expected if significant "new economy" spillover effects were occurring in the economy.[17] Gordon's results, however, are likely to be quite sensitive to the underlying assumptions for potential output growth used in separating trend from cyclical productivity growth.

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[17] Gordon (2000b) explains that the absence of a pickup in total factor productivity growth outside of the computer sector reflects the fact that in his view most computer applications suffer from the rapid onset of diminishing marginal returns, and use of the internet represents a substitution of one form of information gathering for another. In contrast, other inventions such as the electric light or the electric motor had a much greater impact on the standard of living.

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Table 1. United States: Information-Processing Equipment and Software 1/

(Average annual growth rates)

	1960-70	1970-80	1980-90	1990-95	1995-99
Information-processing equipment and software					
Real investment	14.9	15.1	11.5	12.2	20.4
Price deflator	-1.5	0.2	-1.6	-3.5	-7.3
Computers and peripheral equipment					
Real investment	n.a.	n.a.	28.0	28.2	45.5
Price deflator	n.a.	-17.9	-12.6	-13.6	-23.9
Software					
Real investment	32.0	12.7	15.8	12.3	16.2
Price deflator	1.7	3.3	0.8	-1.4	-1.5
Memorandum					
Real GDP	4.2	3.2	3.2	2.4	4.1
GDP price deflator	2.7	7.0	4.3	2.5	1.6

Source: U.S. Department of Commerce, Bureau of Economic Analysis.

1/ Real investment data are chain-linked 1996 dollars.

Table 2. United States: Growth in Labor Productivity, 1960–99 1/

(Percent, average annual rate)

	1960–70	1970–80	1980–90	1990–95	1995–99
Nonfarm business sector	2.9	1.8	1.5	1.6	2.6
Manufacturing	2.6	2.6	2.8	3.3	5.1
Durable manufacturing	2.8	3.0	3.2	4.3	7.6
Nondurable manufacturing	2.6	2.2	2.1	2.3	2.3

Source: U.S. Department of Labor, Bureau of Labor Statistics.

1/ Labor productivity is output per hour of all persons.

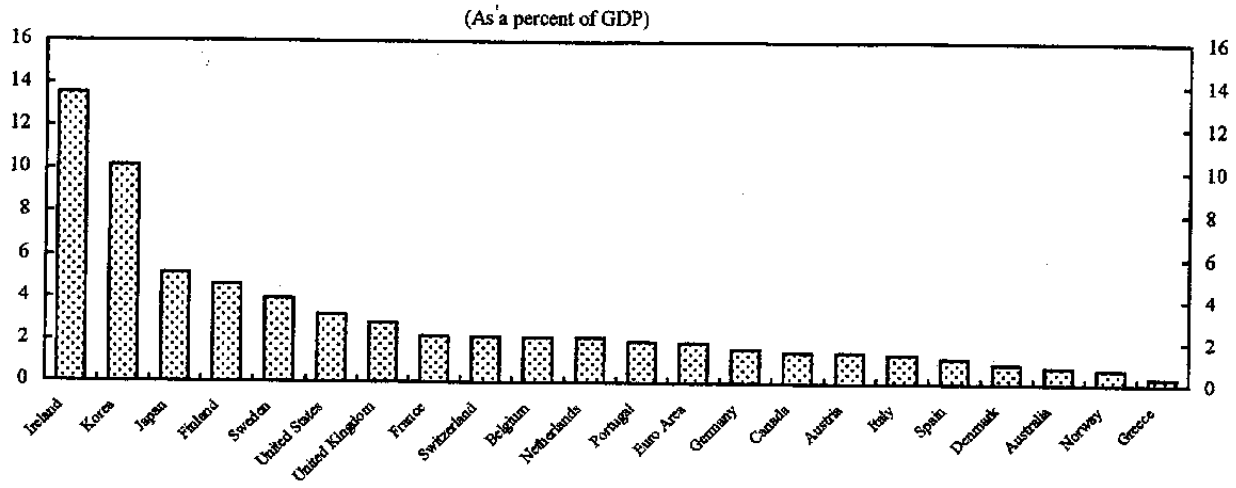
Table 3. United States: Sources of the Acceleration in Labor-Productivity Growth, 1974–99 1/

	Jorgenson and Stiroh 1990–95/ 1995–98	Oliner and Sichel 1990–95/ 1995–99	Whelan 1974–95/ 1996–98	Council of Economic Advisers 1973–95/ 1995–99	Gordon 1972–95/ 1995–99
Acceleration in labor productivity	0.9	1.0	1.0	1.5	0.8 3/
Of which:					
Capital deepening	0.3	0.5	n.a.	0.5	0.3
Information technology	0.2	0.5	0.5	n.a.	n.a.
Other	0.1	0	n.a.	n.a.	n.a.
Labor quality	-0.1	-0.1	n.a.	0.1	0.1
Total factor productivity	0.7	0.7	n.a.	0.9	0.3
Production of information-technology goods	0.2	0.2	0.3	0.2	0.3
Other	0.5	0.5	n.a.	0.7	0.0
All other factors	n.a.	n.a.	0.3	n.a.	0.1 4/
Memorandum:					
Percent of acceleration in labor productivity related to information technology (in percent)	44	64	73	n.a.	n.a.

Sources: Council of Economic Advisers (2000); Gordon (2000b); Oliner and Sichel (2000); and Whelan (2000).

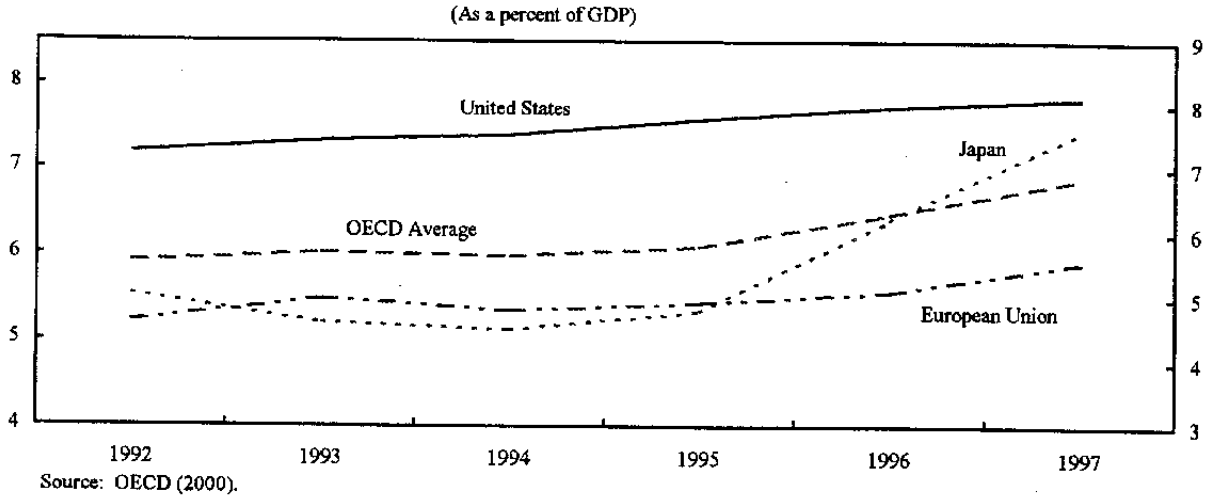
1/ In percentage points.
2/ Estimate based on results for the period 1995–98.
3/ Structural acceleration in labor productivity which eliminates the increases associated with cyclical effects.
4/ Includes contribution of price-measurement changes.

Figure 1. International Comparison: IT Production, 1997



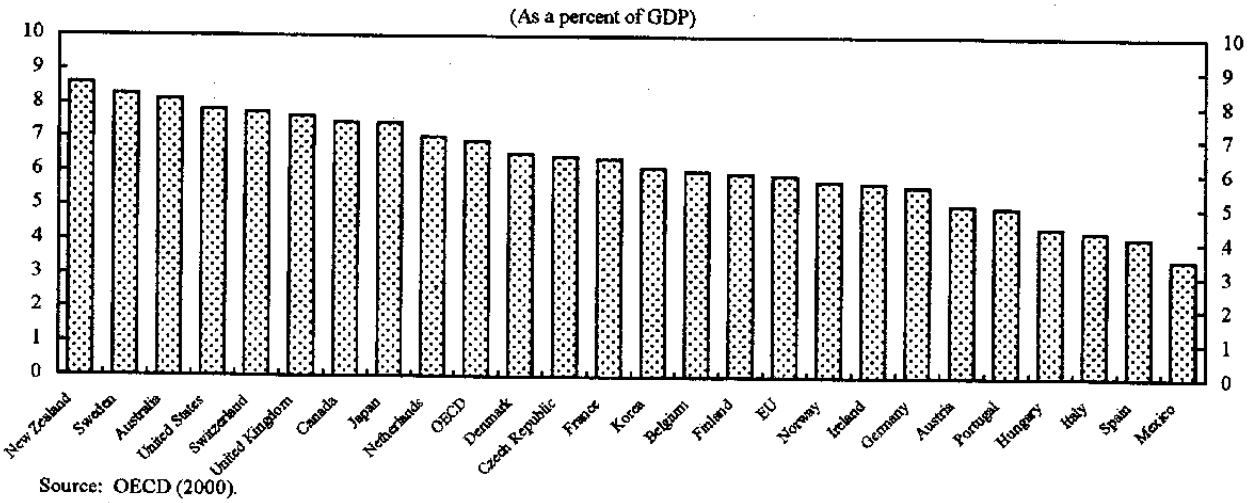
Source: OECD (2000), and World Economic Outlook database

Figure 2. International Comparison: IT Expenditures



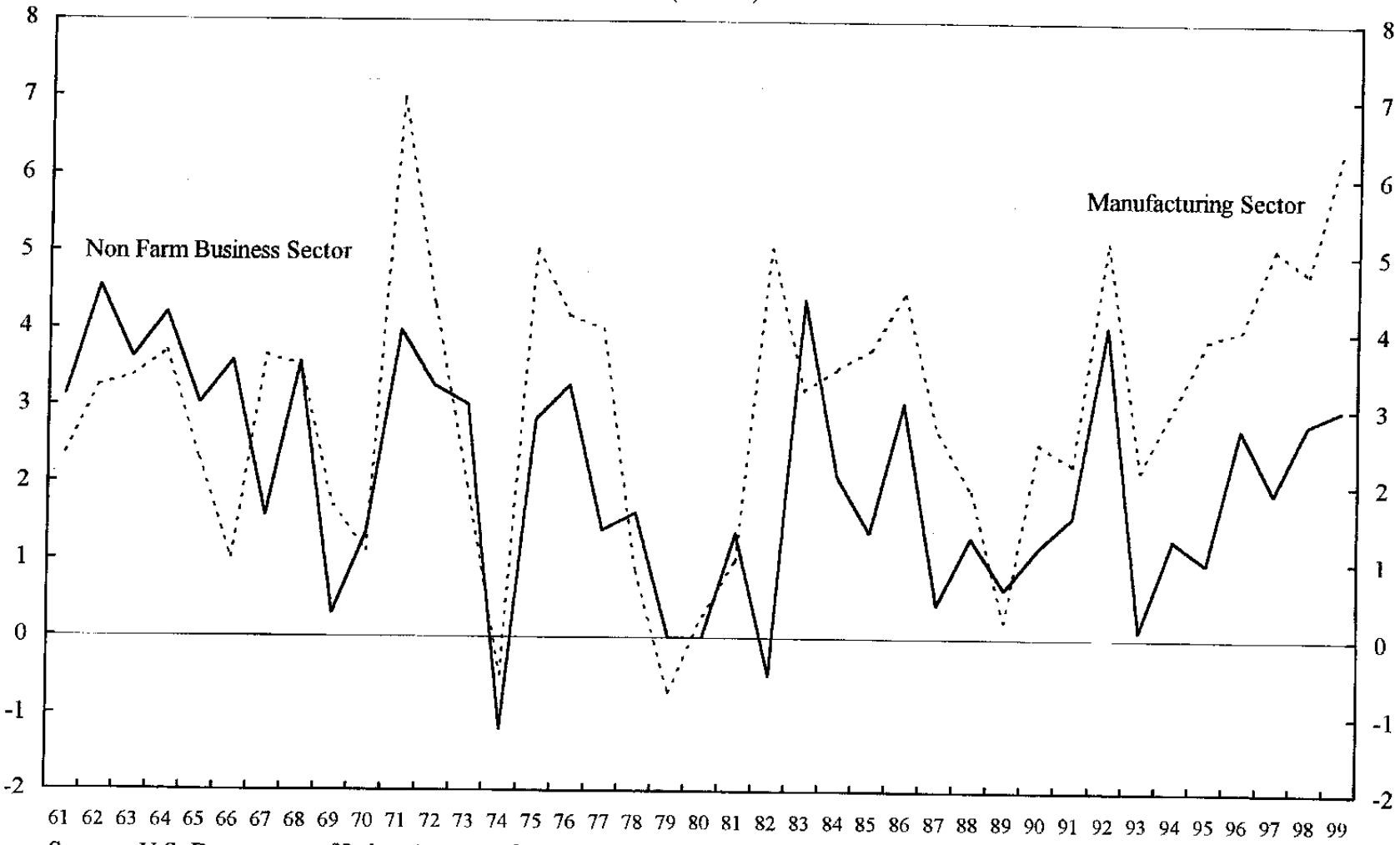
Source: OECD (2000).

Figure 3. International Comparison: IT Expenditures, 1997



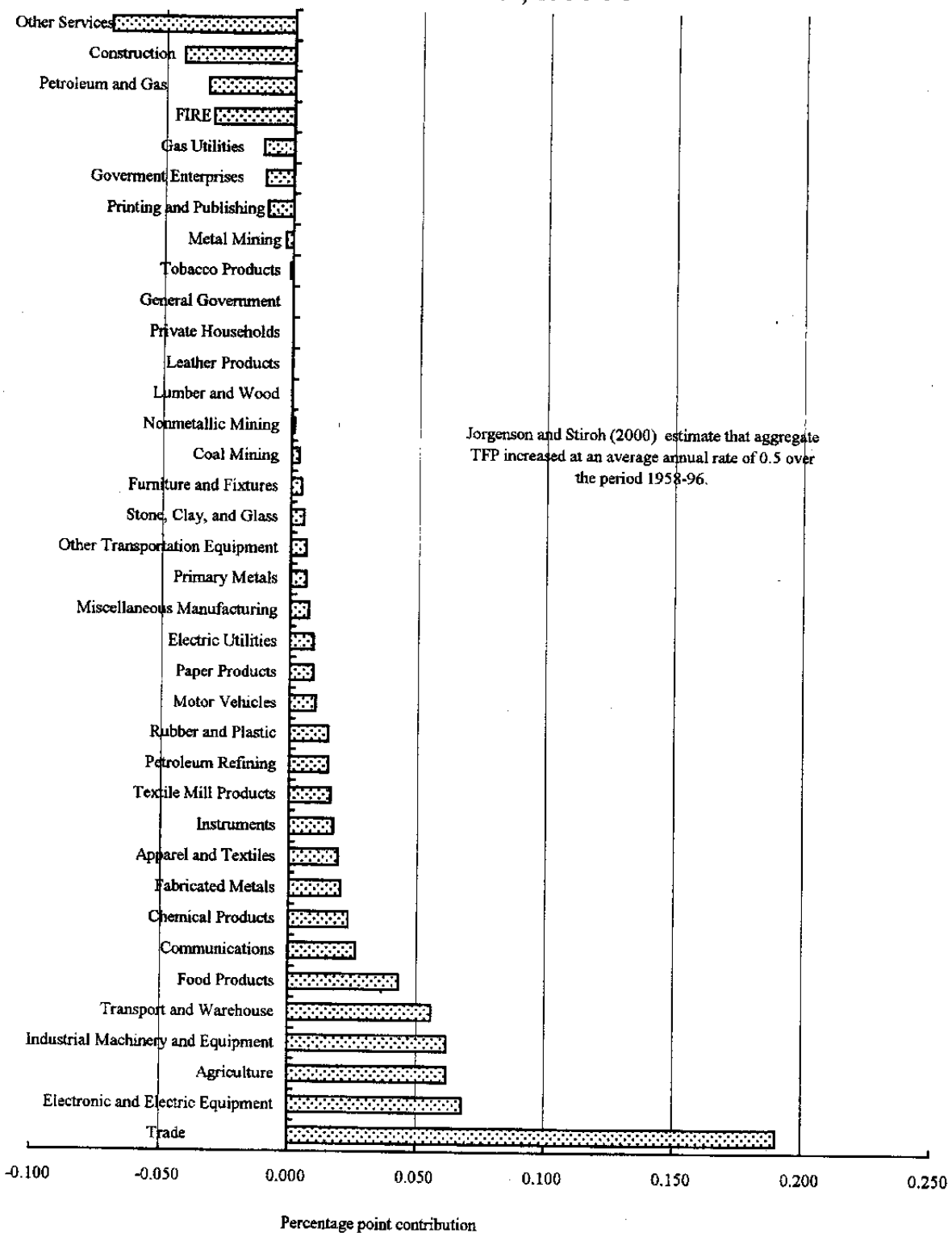
Source: OECD (2000).

Figure 4. United States: Labor Productivity Growth
(Percent)



Source: U.S. Department of Labor, Bureau of Labor Statistics

Figure 5. United States: Industry Contribution to Aggregate TFP Growth, 1958-96



Source: Jorgenson and Stiroh (2000)

II. Potential Output Growth: Revised Estimates[1]

1. Recent data revisions and developments regarding productivity growth suggest that the growth rate of potential output is likely to be higher than previously thought. First, comprehensive revisions to the National Income and Product Accounts (NIPA), released in October of 1999, show that real GDP over the last three decades grew at a faster rate than the previous data indicated. In particular, over the period 1992–98, the average annual growth of GDP based on the new data was 3.6 percent rather than 3.2 percent based on the previously published data (Figure 1). Several factors contributed to the stronger rates of growth in the revised data, including: revisions to source data; new methods to adjust for inflation; and updated definitions of spending categories, with the most important being the inclusion of computer software in investment.[2] Based on gross domestic income data, average annual output growth was 0.4 percentage point higher.[3] Second, the production and use of information technologies also have contributed to boosting productivity growth, and suggest that potential output growth has increased. Labor-productivity growth has accelerated to about 2½ percent per year during the period 1996–99, well above its average annual growth rates during the 1970s and 1980s.

2. There is a wide variety of methodologies for estimating a long-term trend rate of growth for potential output, ranging from simple detrending techniques, to more structural approaches such as the production function approach. Because none of these techniques is free from difficulties, three different methods were used to determine a reasonable range of estimates for potential growth: the segmented trend approach; the Hodrick-Prescott (H-P) filter; and the production function approach. Based on the previously published data, potential output growth

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[1] Prepared by Paula R. De Masi and Martin Kaufman.

[2] The revised data incorporate new source data which include the 1992 benchmark input-output accounts; recent Bureau of the Census data on wholesale and retail trade, construction, state and local governments; updated international transactions data; and wage and salary data. With regard to adjusting for inflation, newly available CPI data are used to revise historical personal consumption expenditures. The most significant definitional change was that business purchases of software were reclassified as private fixed investment, rather than treated as intermediate inputs. Seskin (1999) presents a detailed discussion of these changes.

[3] In theory, gross domestic product based on expenditure data should be equal to the measure of gross domestic product based on income data. The difference between the two is referred to as the statistical discrepancy in the NIPA. In the past, this statistical discrepancy has not been large. Since 1992, however, the discrepancy has widened, with the income measure growing significantly faster than the expenditure measure of GDP. The expenditure measure remains the "official" measure of U.S. GDP, which is why it is used in the analysis presented here.

for the period 1990–98 was estimated to be in the range of 2½–2¾ percent (Table 1).[4] In contrast, based on the revised data, potential output growth is now estimated to be in the range of 3–3¼ percent for the period 1990–99.

3. Among the detrending techniques, the segmented trend approach was used to identify points where the trend rate of growth in GDP may have changed, and in particular to determine whether there was an identifiable trend increase during the current economic expansion. The growth in potential output is assumed to be constant and roughly equivalent to the average annual growth rate between the identified break points. Recursive residual tests were used to identify the break points in the revised chain-linked real GDP series over the period 1959–99. Two break points were found; one occurring in the first quarter of 1975, and the other in the first quarter of 1982; these are the same break points found in the previously published chain-linked real GDP series in 1992 dollars. Using these break points and based on simple log-linear regressions, potential output growth slowed from about 4¼ percent during the period 1960–75, to about 3½ percent during the period 1975–82 and to just over 3 percent in the period thereafter.[5] With real GDP growth of around 4 percent over the last three years, another break point in trend real GDP growth in the mid-1990s may well have occurred. However, given the limitations in present statistical techniques, it is not yet possible to identify such a break point.

4. A second detrending technique, the H-P filter, was also used to detrend real GDP.[6] Because the H-P filter tends to overweigh the end-points in the series being detrended, potential output was estimated over the period from the peak in output in the fourth quarter of 1973 to the end of 1999 (which is implicitly assumed to be a cyclical high point). On this basis, potential growth was estimated to average 3¼ percent a year.

5. The production function approach models output in terms of underlying factors of production, with output specified as a function of capital, labor, and total factor productivity (TFP).[7] Following established practices, the production function was assumed to be a Cobb-Douglas type with constant shares for labor and capital.[8] The data series for the potential inputs

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[4] These results and methodological details were presented in De Masi, Chan-Lau, and Keenan (1999).

[5] The estimation periods for these log-linear regressions were specified from cyclical peak to cyclical peak in an attempt to eliminate the distorting effects associated with end-points that are at different points in the business cycle.

[6] See Hodrick and Prescott (1997).

[7] See Adams and Coe (1990).

[8] The capital and labor shares are based on their shares in national income and are 30 and 70 percent, respectively.

and trend TFP were extracted by using the H-P filter. Using these detrended series, the growth rate of potential output was estimated to be about 3 percent over the period 1990–98.

6. The staff estimates of potential output growth are similar to those published by the Office of Management and Budget and the Congressional Budget Office, but they are lower than estimates from the OECD and some private sector economic analysts like Macroeconomic Advisers (see Table 1). These higher estimates represent measures of potential that change over time depending on the level of investment. Hence, these estimates of potential growth vary over the business cycle. In particular, the recent strong rates of investment have raised the capital stock and the productive potential of the economy, according to these measures. In contrast, the staff's estimates represent long-run trend rates of growth in potential.

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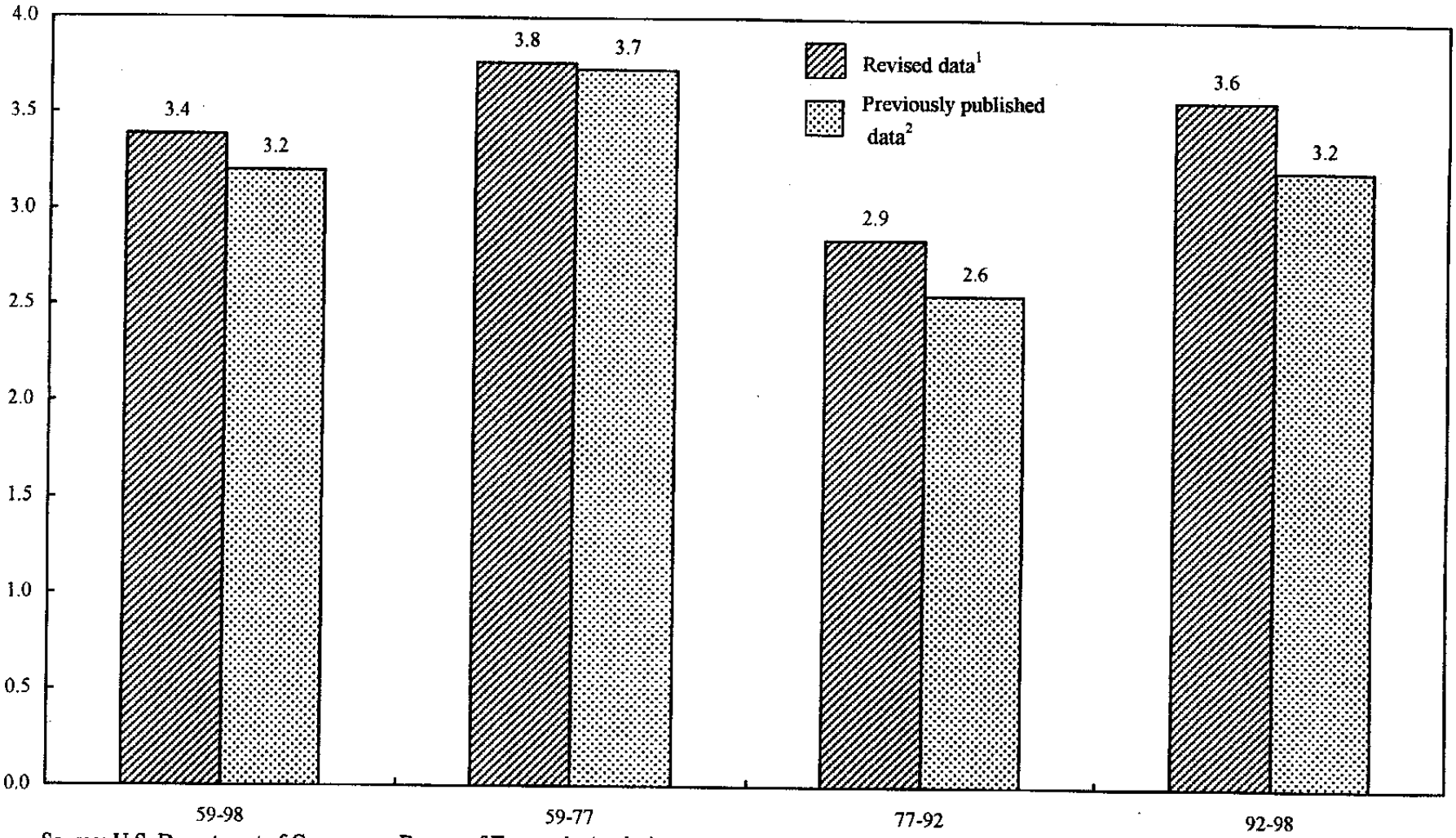
Table 1. United States: Estimates of Potential Output Growth

(Average annual growth rate)

Method/Source	Revised Chained (1996 Dollars) GDP	Previously Published Chained (1992 Dollars) GDP 1/
Staff estimates:		
Segmented trend	3.1 (1982–99)	2.7 (1982–98)
Hodrick-Prescott	3.2 (1973–99)	2.8 (1973–98)
Production function	3.0 (1990–98)	2.6–2.9 (1990–98)
Other estimates:		
Congressional Budget Office (2000)	3.1 (2000–10)	2.7 (1998–09)
Office of Management and Budget (2000)	3.0 (2000–05)	2.8 (1999–02)
OECD (2000)	3.6 (1999)	2.6 (1992-98)
MacroeconomicAdvisers (2000)	3.8 (2000)	

1/ See De Masi, Chan-Lau, Keenan (1999) for a discussion of methodologies and sources.

Figure 1. United States: Average Annual Growth in Real GDP



Source: U.S. Department of Commerce, Bureau of Economic Analysis.

[1] Chain-linked 1996 dollars.

[2] Chain-linked 1992 dollars.

III. Developments in the U.S. Labor Market[1]

1. The strength of economic growth during the current expansion raises the question whether this might be driven, in part, by an unusually strong, and thus possibly unsustainable, surge in the U.S. labor supply. Indeed, the notion that the current expansion has been associated with extraordinary employment growth appears to be fairly common. However, although employment and jobs growth has certainly been strong in absolute terms during the current U.S. expansion, it has been remarkable only in comparison to other major industrial countries.[2] Relative to the U.S. performance of recent decades, employment and jobs growth has been somewhat slower than in previous expansions. While the low level of unemployment achieved has been notable, the decline in the unemployment rate during the current expansion also appears less remarkable when compared to that during the 1960s and 1980s. Employment growth in the United States over the last several decades has, however, generally exceeded that of other major industrial countries by about 1 percentage point per year. A demographic breakdown of employment growth in the United States during the current expansion indicates that employment growth was driven disproportionately by a continuing rise in female participation and a rise in participation of 55–64 year olds.

A. Labor Market Developments in the United States: 1960–99

2. The growth of employment relative to the labor force during the current expansion has lowered the unemployment rate to a level not seen since 1970. Although this is a remarkable achievement, 1970 was a recession year, and the unemployment rate in the first half of 2000 remains above the level prevailing late in the expansion in the 1960s (Figure 1). Jobs growth during the current U.S. expansion is notable more for its duration than its strength (Figure 2). From December 1992 through December 1999, total payroll employment in the United States expanded by about 19 percent (20 million jobs), compared to about 23 percent during a roughly comparable seven-year period in the previous expansion (December 1982 through December 1989). The total growth of the U.S. labor force (household survey), about 9 percent from end-1992 through end-1999, was also significantly lower during the current expansion than the previous expansion (about 12 percent from end-1982 to end-1989), suggesting that there was somewhat less need to absorb workers in the current expansion. Moreover, the resulting decline in the unemployment rate was far less sharp during the early years of the current expansion than

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[1] Prepared by Michael Leidy and Martin Kaufman.

[2] Following the convention adopted by CEA (1999), "jobs" refers to the payroll statistics from the establishment survey of the Bureau of Labor Statistics (BLS) and "employment" refers to statistics from the household survey of the BLS. The establishment survey canvasses a random sample of private nonfarm businesses (including government entities) to estimate the number of people on nonfarm payrolls. The household survey samples the civilian noninstitutional population to estimate the number of people employed in a given week.

early in the expansion of the 1980s. This, of course, was largely attributable to the relatively greater depth of the early 1980s recession. After the unemployment rates converged in the first two years of the current and previous expansions, they followed roughly equivalent paths over the next five years, at which time the 1980s expansion began to lose steam.

3. A number of notable longer-term demographic trends in participation rates are in evidence in the U.S. labor market. The most striking of these are the steady decline in male labor force participation, the strong increase in female participation, and the decline in the participation rate for workers ages 65 and over (Figure 3). Participation rates for workers ages 55–64 moved to a lower level during the decade of the 1970s, but remained roughly stable during the 1980s, and increased by about 3½ percentage points during the current expansion. When the 55–64 age group is decomposed by gender, it is apparent that the decline in the participation rate during the 1970s was driven by falling male participation, as female rates remained roughly constant. Female participation rates in this age group began a steady increase in the late 1980s, while participation rates for males ages 55–64 essentially leveled off at around 67½ percent.

4. During the current expansion (1992–99), labor force growth has been fueled in large part by women and by 55–64 year olds. The overall participation rate increased by 2/3 of a percentage point, with a slow continuation of the trend toward rising female labor force participation rates and falling male participation rates. The continuing rise in female participation is reflected in the female share of total employment growth during 1992–99 (Figure 4). The 55–64 age group had the largest increase in the rate of participation over this period, and this age group also accounted for a disproportionate share of employment growth relative to its share of total employment (Figure 5). The downward movement in participation rates for males ages 55–64 continued during the first two years of the current expansion, but then gradually reversed course, leaving the participation rate for males ages 55–64 about unchanged from March 1991 through March 2000; female participation rates for this age group during the same period increased from 45 percent to 52½ percent.

5. In addition, welfare caseloads have fallen from record highs in 1994 to a level in 1999 not seen since the late 1960s. At the same time, the percentage of welfare recipients working tripled between 1992 and 1997. A study by the CEA (1999) has found that during 1993–96, about one-third of the caseload decline was due to improved labor market conditions. The same study estimated that roughly one-third of the caseload decline between 1996 and 1998 was due to the 1996 welfare reforms, and only around one-tenth was due to the strong conditions in the labor market.[3]

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[3] The *Personal Responsibility and Work Opportunity Act* enacted in August 1996 was designed to facilitate movement from dependency on social assistance to employment by giving states greater flexibility in the design and implementation of welfare programs. Critical among the new rules, federally funded assistance is generally limited to no more than five years in a lifetime, and

(continued...)

6. Although it is difficult to track the contribution of the 1996 welfare reform legislation to labor growth, the data reveal a significant increase in the employment of female heads of households. In 1997, the first year of operation under the new welfare rules, the employment of female heads of households increased by 5½ percent (Figure 6). The increase in employment of this group in the period 1996–99 represented about 13 percent of the increase in total employment in those years.

7. Although difficult to measure, another factor that has contributed to the growth in the U.S. labor force in the last decade is the growth of the foreign-born population. The foreign-born population is estimated to have risen in the last decade from 8 percent of the total population to near 9½ percent, or almost 6 million people.

B. How Do U.S. Labor Market Developments Compare with Those in Other Industrial Countries?

8. During the period 1960–98, the United States exhibited stronger growth rates in the civilian labor force than all other major countries, except Canada (Table 1 and Figure 7).[4] France had a continued decline in its labor force growth since the 1960s, but in the later part of the 1990s it has shown an increased rate of growth. In contrast, Japan and Germany (after the unification) both have shown slower labor force growth in the 1990s than in the 1980s.

9. With the exception of Japan, labor force participation rates in the major industrial countries were broadly similar at about 60 percent of the civilian working-age population in 1960. Since then, participation rates in France, Germany, and Japan have declined, while participation rates in Canada and the United States moved significantly higher; the participation rate in the United Kingdom remained essentially flat (Figure 8). In all countries, male participation rates have fallen continuously over the last 40 years (Figure 9). The drop in male participation rates was especially pronounced and sustained in France, Germany, and the United Kingdom. In Canada, Japan, and the United States, the 40-year decline in the male participation rate was less precipitous. Helping to offset the downward trend in male labor force participation, female participation rates were generally rising in Europe and North America (Figure 10).

10. Using BLS data, Krueger and Pischke (1997) estimated long-term trends in employment growth across ten major industrial countries. Over the period 1959–95, they find that U.S.

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strengthened work requirements mandate that individuals have some participation in the labor force within two years of receiving assistance.

[4] The data set covers the period 1959–98 for the G-7 countries and the Netherlands and Sweden. The U.S. Bureau of Labor Statistics' (BLS) has compiled international estimates of employment, labor-force growth, unemployment, and labor force participation, that use U.S. concepts of employment and working-age population. These data facilitate direct comparisons between the United States and these other countries.

employment growth exceeded that of the others by about 1 percentage point per year, while Germany, for example, fell behind the rest of the major countries by about 0.7 percent per year. A large part of the cross-country differences in employment growth is explained by different rates of growth in the working-age population. Specifically, in the case of the United States, about 60 percent of the faster trend U.S. employment growth is explained by the higher growth of the U.S. working-age population. Even after controlling for differences in population growth, however, U.S. employment growth is estimated to remain above the ten-country trend, and Germany's is estimated to remain below.

C. The Outlook for U.S. Labor Force Growth

11. In the decade ahead, the labor force is expected to continue to grow roughly in line with that in the past decade, and, thus, it does not appear that a slowdown in labor force growth will present an obstacle to continued strong potential GDP growth. The rate of growth in the U.S. labor force in the next decade is projected to slow very slightly, owing to a modest slowdown in the growth of the working-age population and a slightly slower rate of increase in the female participation rate. Specifically, Fullerton (1999) estimates that the labor force in the period 1998–2008 will grow by 12 percent compared to 13 percent in 1988–98. The rate of growth of women in the labor force is expected to slow (to 1.4 percent annually from 1.5 percent in the period 1988–98), but would still remain above that of men, and the share of women in the labor force is projected to increase from 46 percent in 1998 to 48 percent by 2008. For men, the rate of growth in the labor force is projected to continue slowing (to 0.9 percent annually from 1 percent in the period 1988–98).

12. The labor force participation rate is projected to rise by ½ percentage point between 1998 (67.1 percent of working-age population) and 2008 (67.6 percent). For women, the participation rate is projected to increase from 59.9 percent in 1998 to 62 percent in 2008. The overall rate of labor force participation for men is projected to drop about 1¼ percentage points (from 74.9 percent in 1998), similar to the decline in the last decade.

13. The significant migration to the United States that started in the 1970s and has continued to the present is projected to slow only modestly in the decade ahead. Thus, a significant share of the population growth projected for the period 1998–2008 will stem from net immigration flows. Moreover, the labor force will be affected by the aging of the baby-boom generation (those born between 1946 and 1964); the median age of the labor force will rise to record levels and the aging of the baby-boom generation will eventually contribute to lowering the overall participation rate.

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Table 1. United States: Labor Market Developments

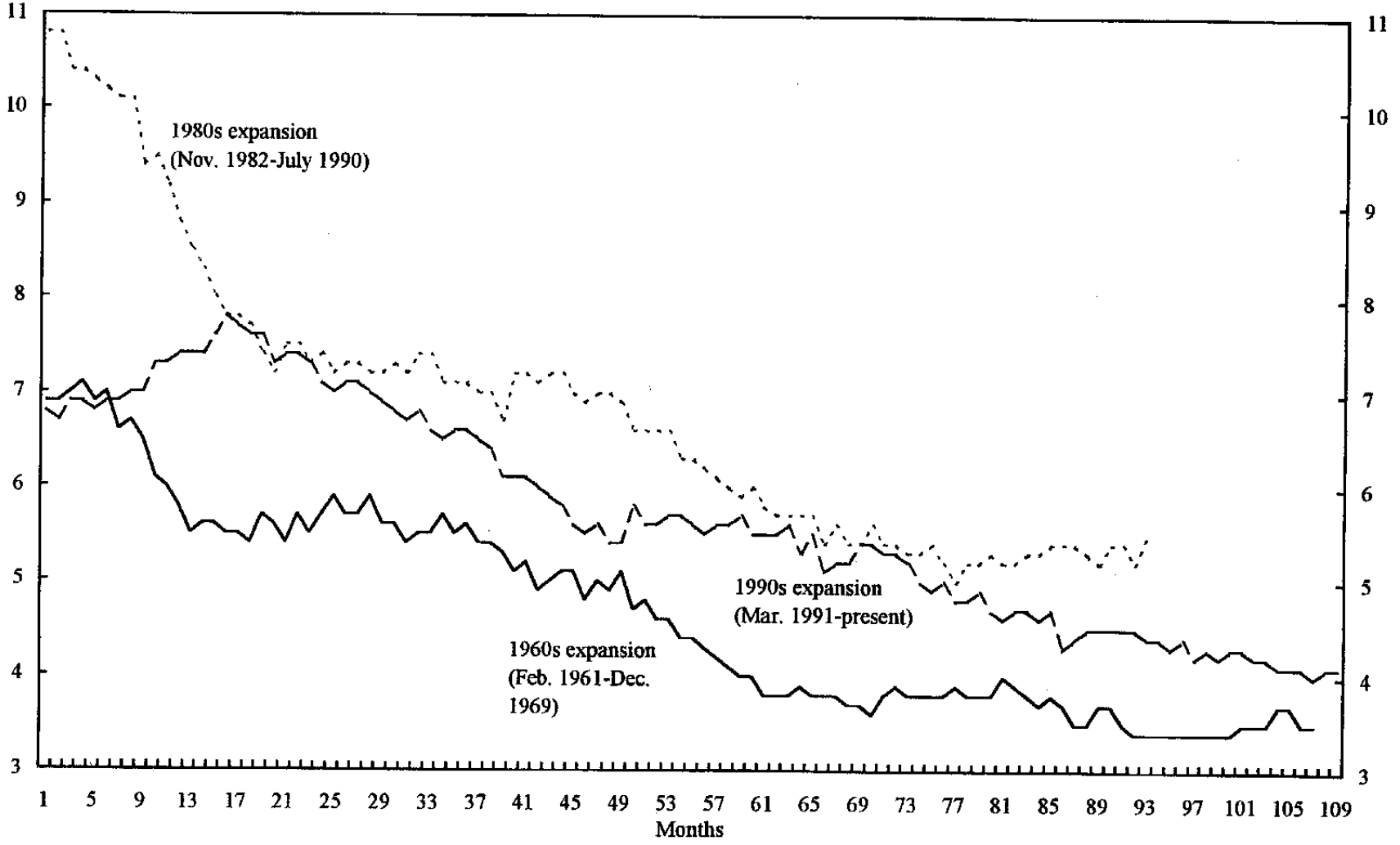
(In percent)

	1960s	1970s	1980s	1990s 1/
United States				
Employment growth	1.9	2.4	1.7	1.7
Labor force growth	1.7	2.7	1.6	1.3
Participation rate	59.2	61.5	64.8	66.8
Canada				
Employment growth	2.8	3.1	2.0	1.1
Labor force growth	2.7	3.5	2.0	1.1
Participation rate	56.7	60.5	65.5	65.5
Germany				
Employment growth	0.2	0.1	0.4	-0.5
Labor force growth	0.1	0.3	0.7	0.1
Participation rate	58.6	55.5	54.8	57.7
France				
Employment growth	1.0	0.7	0.2	0.4
Labor force growth	1.0	1.1	0.6	0.6
Participation rate	57.8	57.5	56.9	55.6
United Kingdom				
Employment growth	0.5	0.2	0.6	0.3
Labor force growth	0.5	0.5	0.8	0.2
Participation rate	62.0	62.0	62.6	63.0
Japan				
Employment growth	1.6	0.9	1.1	0.6
Labor force growth	1.5	1.0	1.2	0.8
Participation rate	65.6	63.3	62.4	63.0

Source: Bureau of Labor Statistics.

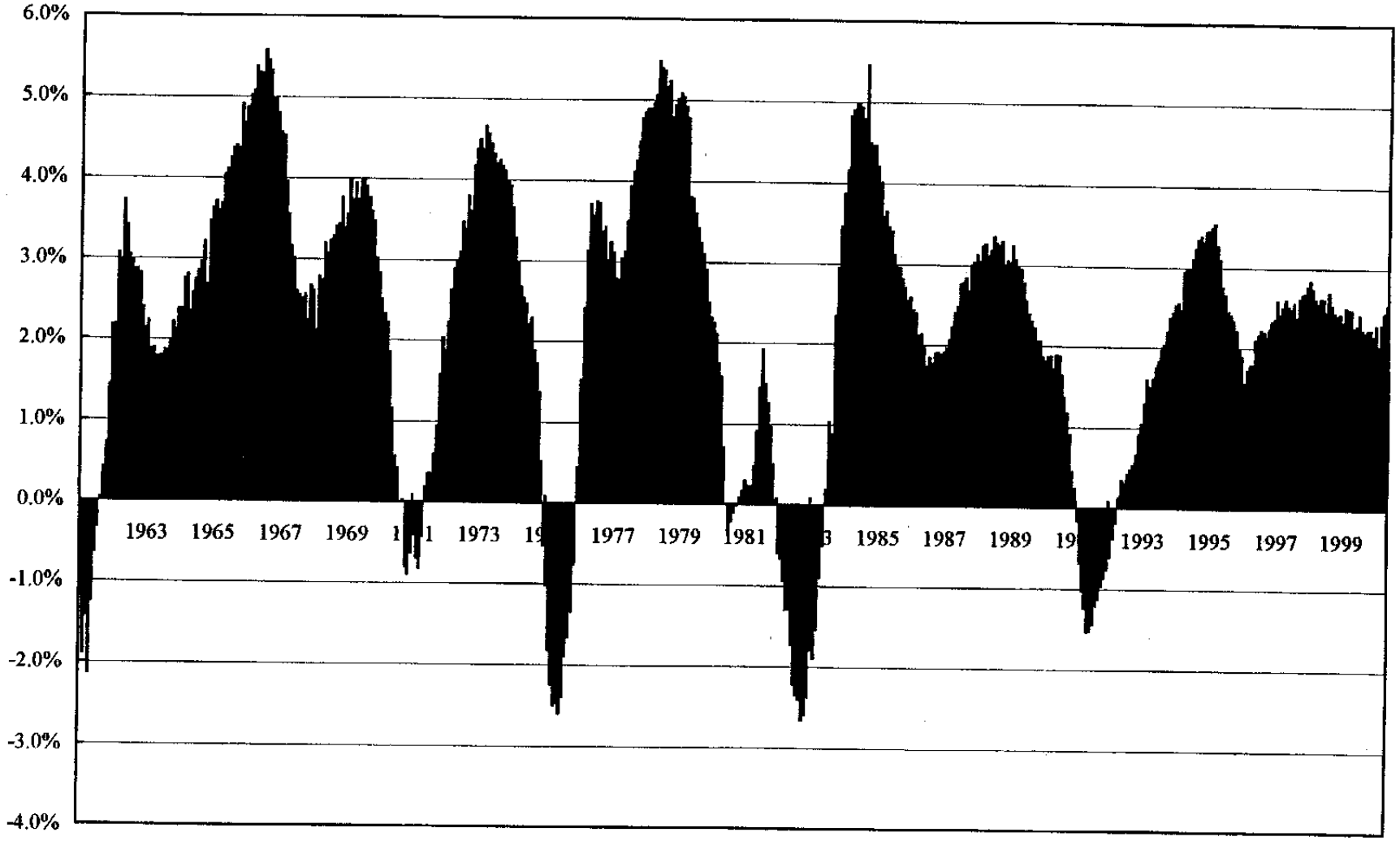
1/ United States, 1992–99 and Germany, 1992–98.

Figure 1. United States: Unemployment Rate
(percent)



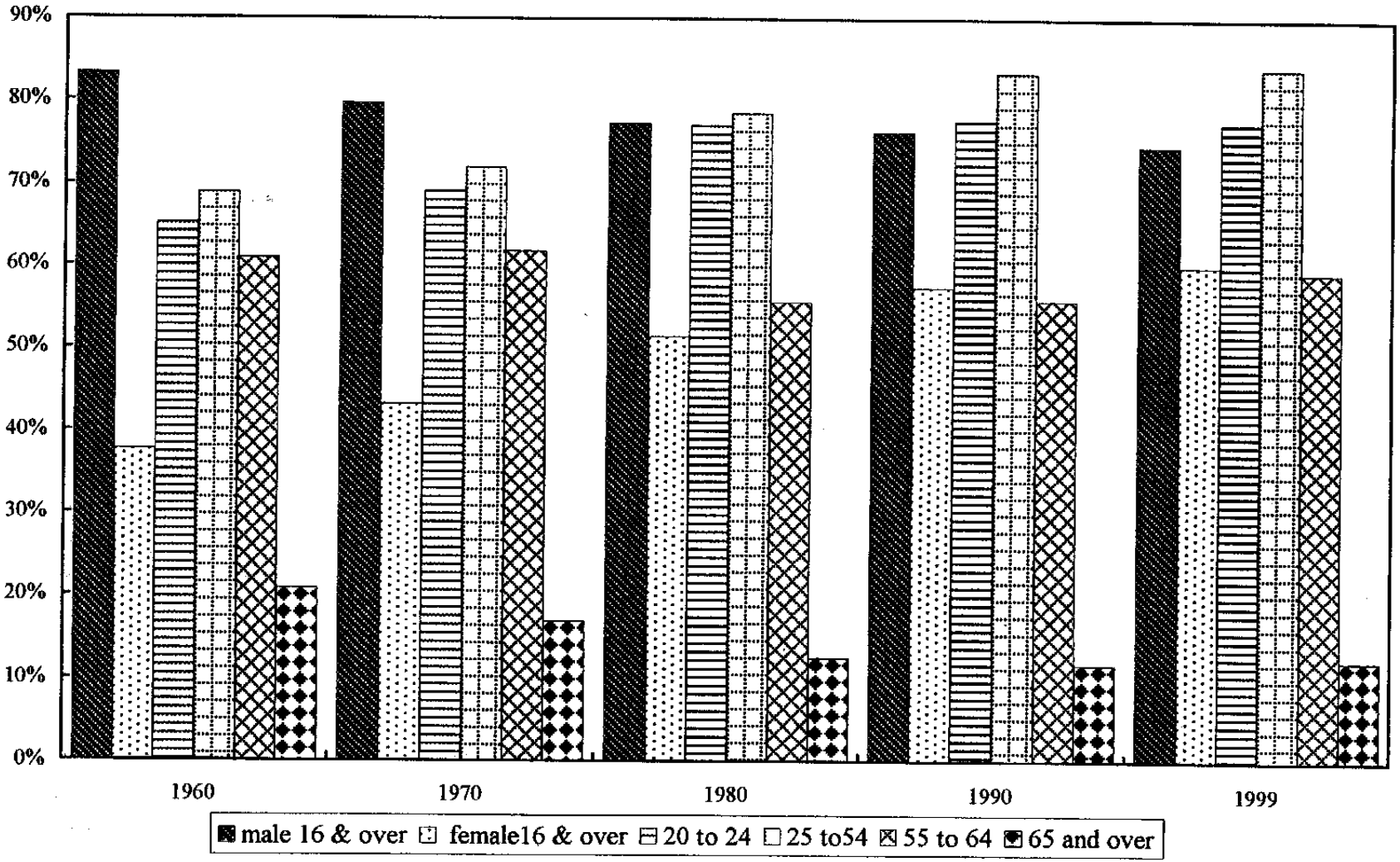
Source: U.S. Bureau of Labor Statistics and National Bureau of Economic Research.

Figure 2. United States: Jobs Growth
(12-month moving average, annualized)



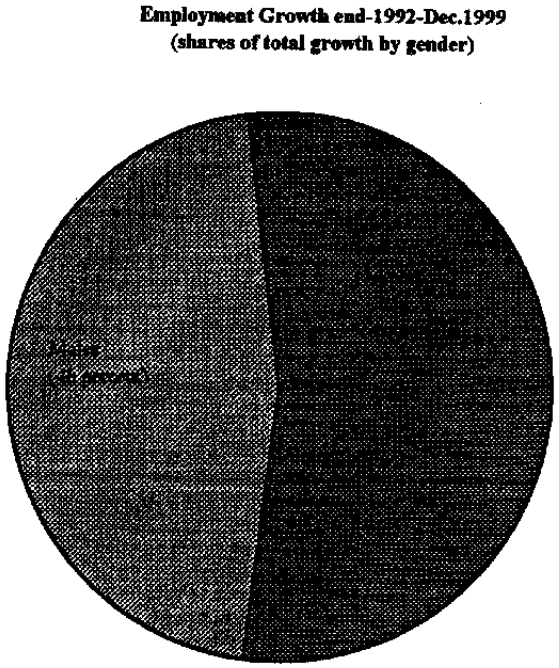
Source: Bureau of Labor Statistics, Establishment Survey.

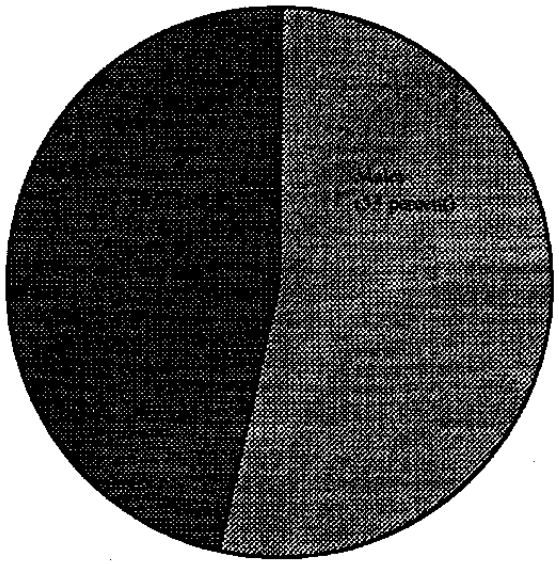
Figure 3. United States: Trends in Labor Force Participation Rates, 1960-99



Source: U.S. Bureau of Labor Statistics.

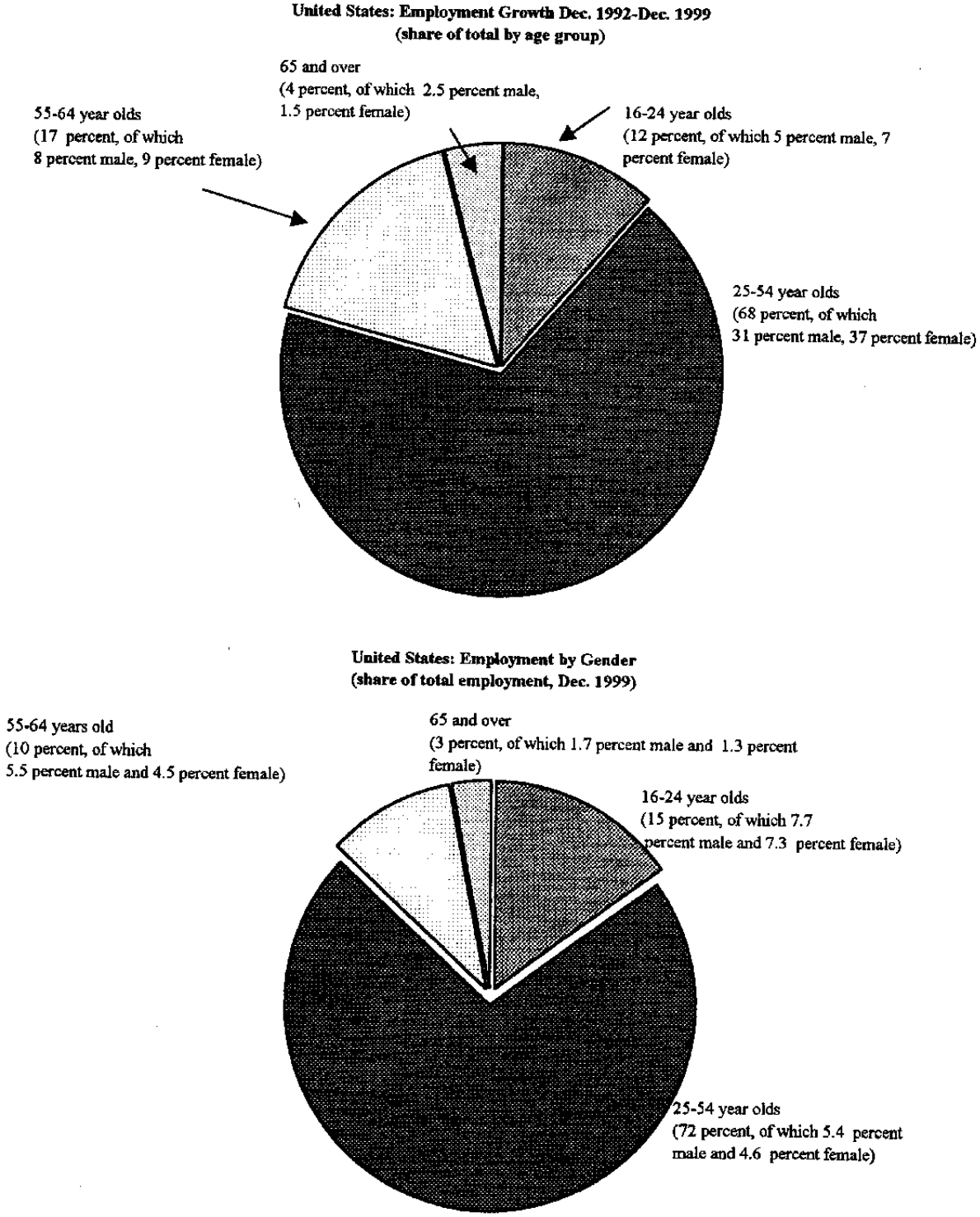
Figure 4. United States: Employment and Employment Growth (by gender)





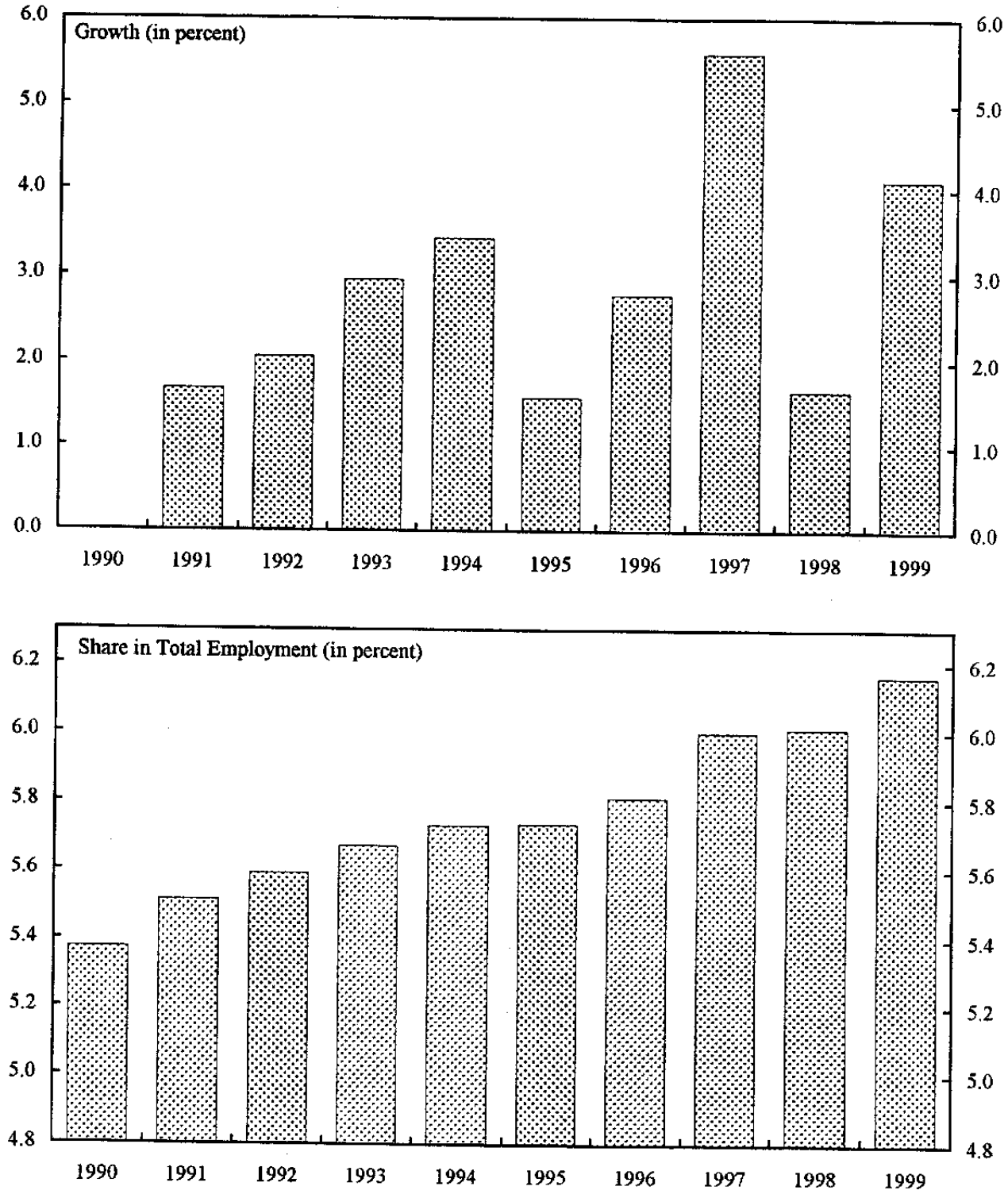
Source: U.S. Bureau of Labor Statistics, Household Survey.

Figure 5. United States: Employment Growth and Employment (by age group)



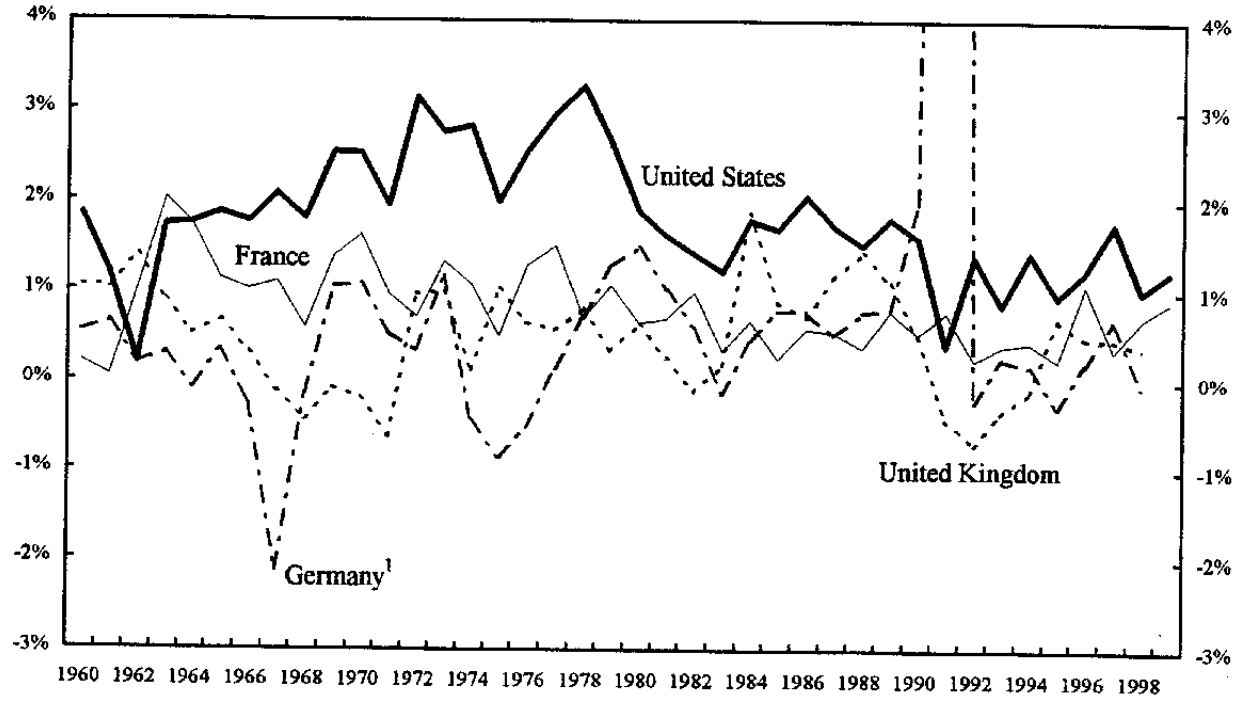
Source: U.S. Bureau of Labor Statistics, Household Survey.

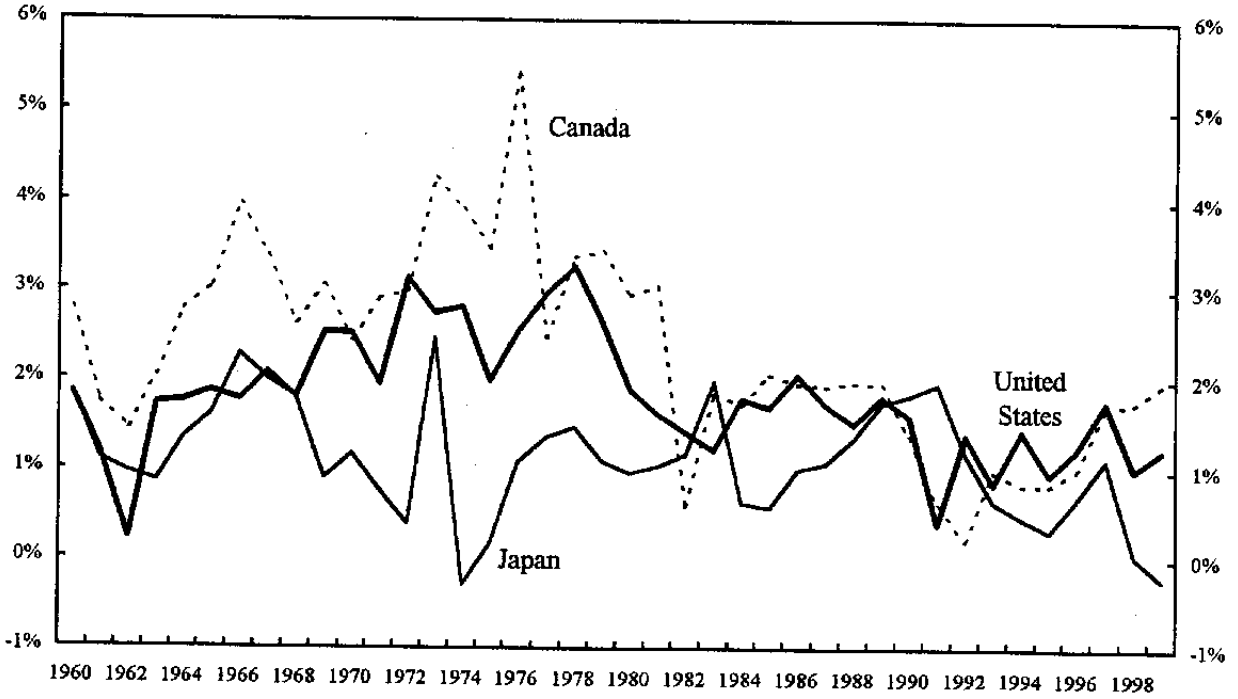
Figure 6. United States: Employment of Female Head of Households, 1990-99



Source: U.S. Bureau of Labor Statistics.

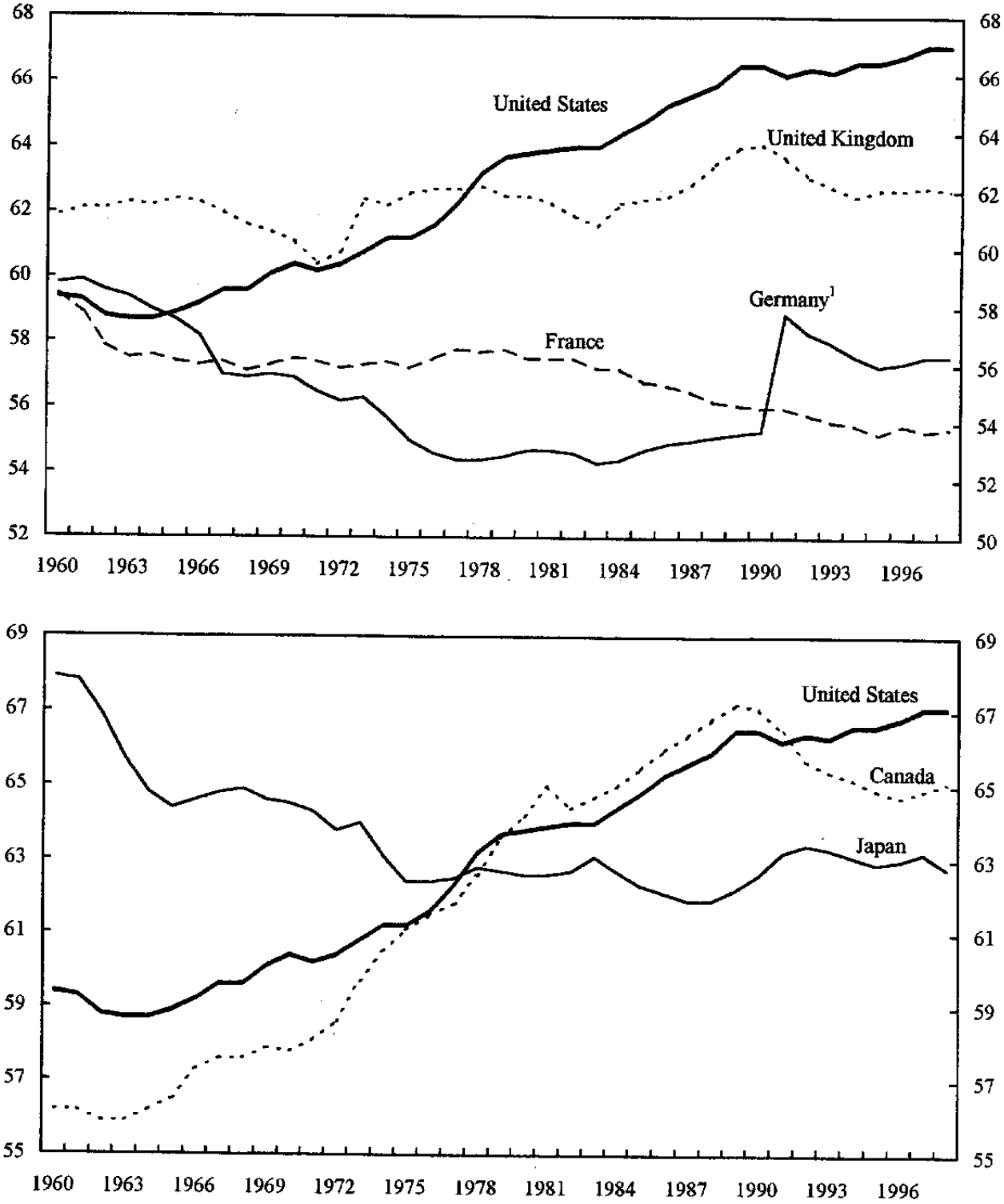
Figure 7. United States: Civilian Labor Force Growth, 1960-98
(percent)





Source: U.S. Bureau of Labor Statistics.
1 Unified Germany, 1991 onward.

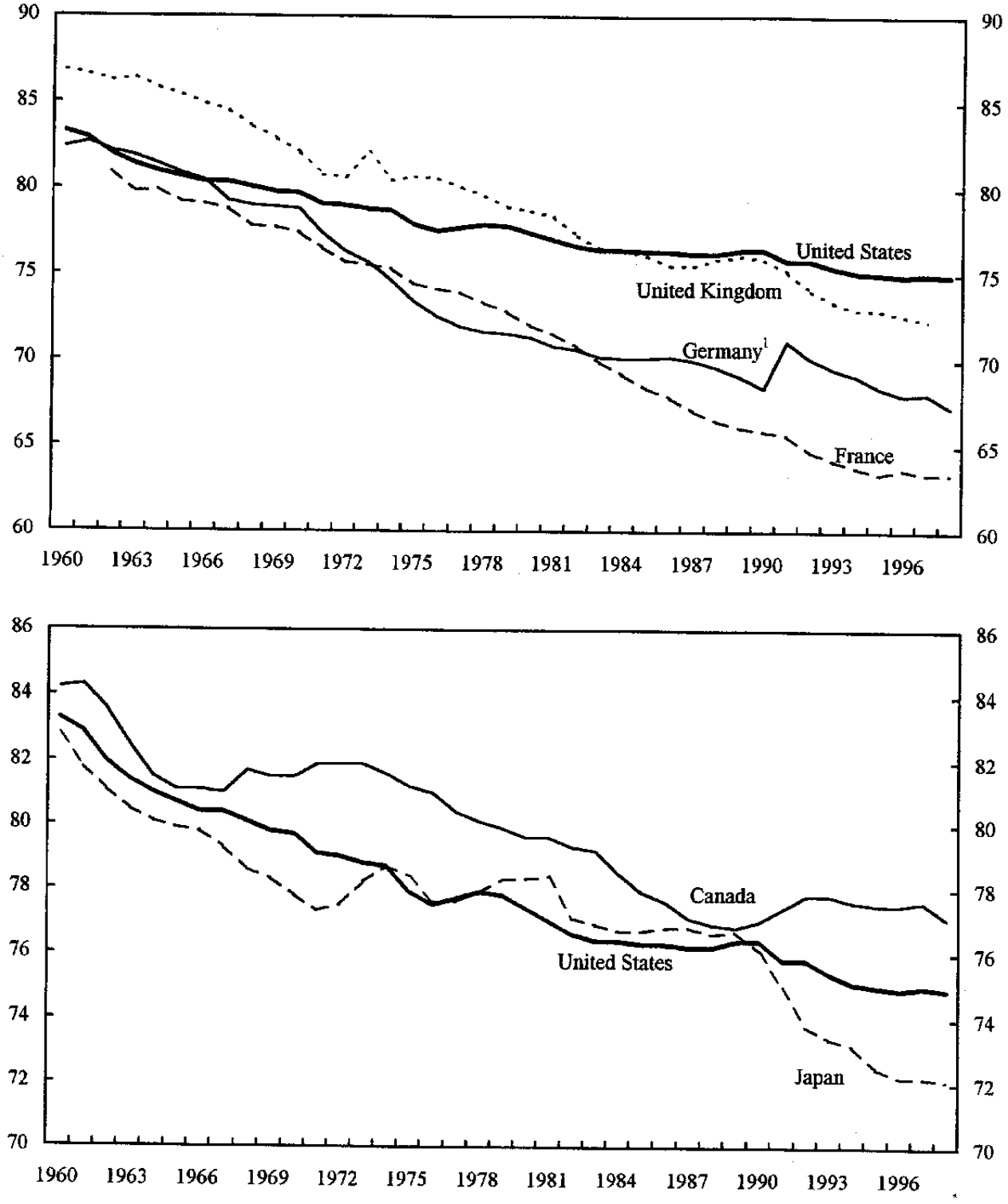
Figure 8. United States: Civilian Labor Force Participation Rates, Selected Countries, 1960-98
(percent of working-age population)



Source: Bureau of Labor Statistics.

[1] Unified Germany, 1991 onward.

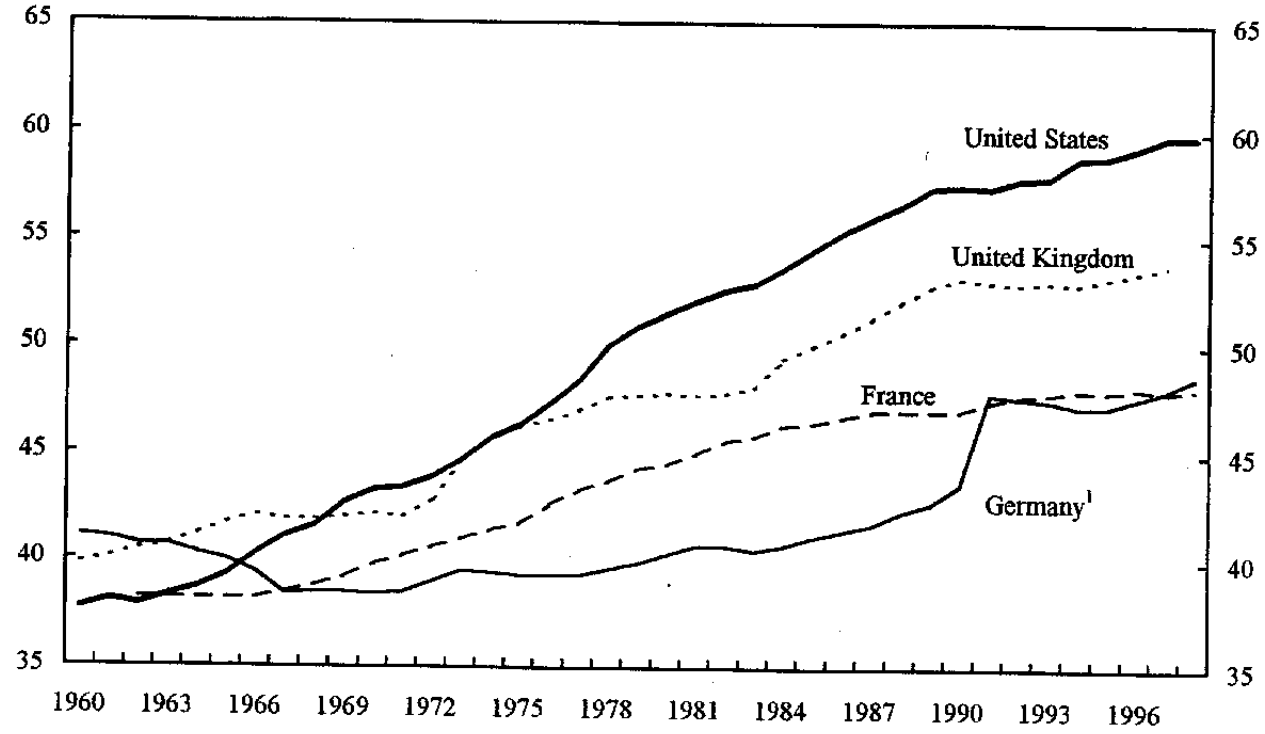
Figure 9. United States: Male Labor Force Participation Rates, Selected Countries, 1960-98
(percent of working-age population)

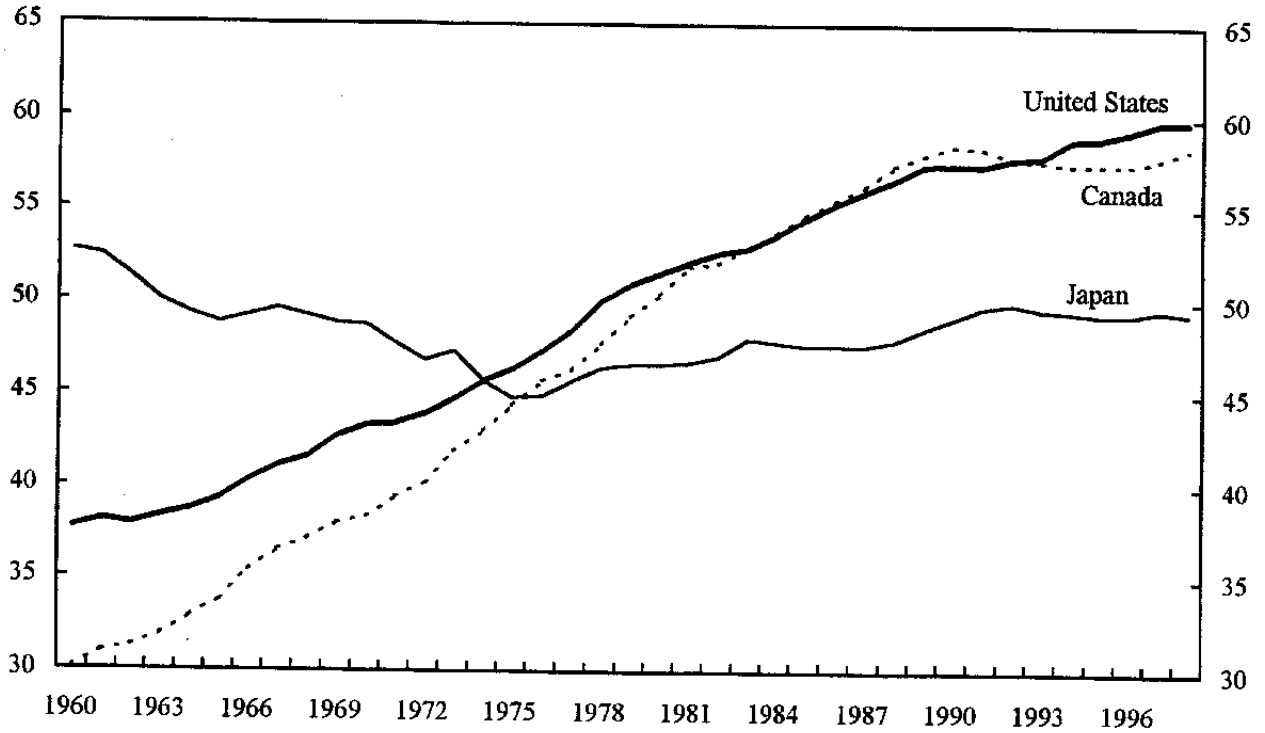


Source: Bureau of Labor Statistics.

[1] Unified Germany, 1991 onward.

Figure 10. United States: Female Labor Force Participation Rates, Selected Countries, 1960-98
(percent of working-age population)





Source: Bureau of Labor Statistics.

[1] Unified Germany, 1991 onward.

IV. U.S. Equity Prices and the Technology Boom[1]

1. Current U.S. equity market valuations have raised considerable concern and debate about the underlying factors driving them and the role played by the sharp rise in the development and applications of new technologies in the U.S. corporate sector. Traditional indicators, such as the dividend yield and the price-earnings (P/E) ratio, indicate that equity prices have moved significantly out of line with historic values. During 1999, the average P/E ratio for S&P500 stocks was 31, almost twice the post-World War II average value of 17 (Table 1).[2] However, while current market valuations are difficult to justify in terms of historic averages for those variables, reconciling current market valuations for S&P500 stocks with investors' expectations regarding real-earnings growth and the risk premium on equities is possible, especially given the impressive performance in corporate profits since end-1994.[3] Nevertheless, current market valuations, particularly for technology stocks, appear to be highly elastic to changes in expected earnings growth and discount factors, which would suggest increased volatility in equity prices if earnings growth does not meet investors' expectations.

2. Based on a constant-growth valuation model,[4] the current P/E ratio for S&P500 stocks would imply that investors expect real-earnings growth to remain close to its annual

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[1] Prepared by Martin Cerisola and Gustavo Ramirez.

[2] This average is calculated for the period 1954–94, excluding the higher inflation sub-period 1970–84. High inflation biases P/E ratios downwards because it tends to adversely affect the quality of reported earnings. In particular, high-inflation periods tend to overstate reported earnings through the effect on depreciation allowances and inventory valuation.

[3] The growth rate of earnings per share in real terms is calculated by deflating the growth in nominal earnings per share with the chain-type GDP price deflator. Growth in real earnings per share has been broadly in line with the growth rate of real GDP in the United States, reflecting the fact that the share of capital in national income has been relatively stable over time.

[4] For a constant dividend-payout ratio d and a constant rate of growth in earnings per share g, the price-earnings ratio can be expressed as follows:

$$\frac{P}{E} = \frac{d}{r-g}$$

where r is the expected return on equity capital. In the results presented here, r is approximated by the yield on a risk-free asset (the ten-year U.S. government bond) plus a risk premium.

average rate of 7¾ percent since end-1994, assuming that the dividend-payout ratio and the equity premium return to their historic averages of 55 percent and 4½ percent, respectively (Table 2).[5] Such a high rate of growth in real earnings would imply a significant and sustained increase in the share of corporate profits in GDP. Alternatively, investors may be willing to accept a lower rate of return on equity capital if the riskiness of equities relative to other assets has been perceived to decline. If real earnings for the S&P500 stocks were to grow by 2¾ percent, in line with their average in 1954–94, the current P/E ratio would suggest that the equity-risk premium has declined markedly, to roughly ½ percent. Possibly, current U.S. equity prices reflect some combination of above historic expected growth in real earnings in the coming years and some reduction in the equity premium.

A. What Does the Sectoral Evidence Suggest?

3. A breakdown of the S&P500 stocks into industrial, financial, transportation, and utilities reveals that P/E ratios, dividend-payout ratios, and growth in real earnings have varied considerably across sectors (see Table 1). While most of these sectors have experienced a marked increase in P/E ratios and real earnings growth since 1995 and a decline in dividend-payout ratios—relative to their historic values—the dispersion of P/E and dividend-payout ratios, and real earnings points to significant differences for what current U.S. equity prices imply in terms of expected real-earnings growth and investors' risk premia across sectors.

4. The high valuation of S&P500 stocks reflects primarily high equity prices in the industrial sector, where most of the new technologies are being developed and applied. The P/E ratio for the S&P500 industrial stocks suggests that the growth in real earnings would be expected to remain very strong and even accelerate in the period ahead, exceeding by 10 to 30 percent its growth performance since 1995, depending on the equity-risk premium. Likewise, a slowdown in real earnings to historical growth rates would suggest that the equity-risk premium for the industrial sector has been virtually eliminated.[6]

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[5] The real return on U.S. equities was 7.1 percent between 1946 and 1996 (Siegel (1998)). The real return on ten-year U.S. government bonds was about 2½ percent during the same period, which would suggest an equity premium of roughly 4½ percent. However, as noted by Siegel, depending on which risk-free asset is chosen, the equity premium could be as high as 6 percent on average. If the equity premium were 6 percent, a P/E ratio of 31 would suggest that investors expect real earnings to grow by 8¾ percent per year.

[6] Price-earnings ratios for the industrial, transportation, utilities, and financial sectors, declined somewhat during the first quarter of 2000. However, the decline does not change the main results and conclusions presented in the paper. In particular, most of the industrial subsectors have experienced a decline in their P/E ratios, but these ratios remain significantly above their long-term average. In addition, while the P/E ratio for the technology subsector has risen

(continued...)

5. In contrast, the estimates show that current P/E ratios for S&P500 firms in the financial, transportation, and utilities sectors appear to be more realistic in terms of the implied expected growth in real earnings and investors' risk premia, and provide no clear indication of overvaluation. For most of these sectors, the estimates suggest that the current P/E ratios would be consistent with some acceleration in real-earnings growth and a lower risk premium required by investors. Even though the implied expected real-earnings growth for S&P500 financial stocks would exceed its historic average, it would still be significantly below the average growth rate observed since 1995. If real-earnings growth were to return to its historic average, the implied equity premium for S&P500 financial stocks would be 3¾ percent, slightly lower than the historic average for the overall S&P500 index. In the case of S&P500 transportation stocks, the implied expected growth in corporate profits seems to be broadly in line with its historic average, and significantly below the strong performance since 1995. If the average growth of real earnings in transportation were to return to its historic average, the current P/E ratio would be consistent with an equity premium of 7¼ percent, higher than the historic average for S&P500 stocks. This apparent increase in the relative riskiness of the transportation sector may reflect the effects of the deregulation of this sector over the past two decades. As for S&P500 utilities stocks, the model does not provide a clear view on whether current valuations are significantly out of line. While the model suggests expected growth rates in real earnings broadly in line with the performance since 1995, the implied risk premium appears to be too low in terms of the historic average for the overall S&P500 stocks. Nonetheless, such a low equity-risk premium for utilities could reflect the fact that this sector has traditionally been highly regulated, and therefore, may not be perceived as risky as other sectors in the economy.[7]

B. What Do Current Valuations for the Industrial Sector Suggest?

6. A breakdown of the S&P500 industrial sector index shows that most of the subsectors had high P/E ratios on average, with technology, health care, and energy firms having the highest P/E ratios (Table 3). In addition, the industrial sector shows a wide dispersion of growth rates in real earnings per share and in dividend-payout ratios across subsectors since 1994 and, particularly, in 1999. While most of the subsectors experienced a marked increase in real earnings per share growth, the performance of the technology subsector since 1994 stands out from the rest. Real-earnings growth in technology firms has risen from about ¼ percent annual rate during 1987–94 to an average of 11½ percent per year since 1995, including a 54 percent increase in 1999.

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markedly in the first quarter, price developments since then would suggest that the P/E may have declined sharply.

[7] The situation is likely to change, as more states move forward in deregulating utilities, particularly in the energy sector.

7. The estimates show that the current P/E ratios for the subsectors in the S&P500 industrial index would imply the expectation of continued above-normal growth in real earnings or almost no equity-risk premium, if earnings were to return to historic averages (Table 4). The expectation of sustained above-normal earnings growth seems particularly pronounced for sectors which have not experienced sustained high rates of growth in real earnings over a long period of time, such as basic materials, communication services, and consumer cyclicals and staples, as well as for others, such as technology, energy, and health care, which have experienced an upward trend in profitability since 1987. Nevertheless, the estimates show that, if real-earnings growth in the industrial sector were to slow down to its historic annual average of 3¼ percent, current P/E ratios would imply an equity-risk premium that has been virtually eliminated for most subsectors, especially for technology and health care.

C. What Can be Inferred from Current Valuations for Technology Stocks?

8. The high level of P/E ratios for technology subsectors reflect buoyant real-earnings growth since 1995, which has been particularly pronounced in computers, electronics, and communications equipment (Table 5). Nevertheless, the technology sector has retained a large proportion of its earnings to finance investment, as the dividend-payout ratios have been extremely low in technology stocks, particularly when compared with other industrial stocks. The combination of high P/E and low dividend-payout ratios would suggest that investors expect high dividends in the future for technology stocks.

9. While the current configuration of technology stock prices would suggest that investors may have developed unrealistic expectations of long-term earnings growth or risk, the recent performance of technology firms has been remarkable and could be sustained in the period ahead (Table 6). As noted by Whelan (1999), the application of computing technologies has exploded in the United States during recent years, which has induced a sharp boost to productivity in the computer-producing sector. The current pace of development in new technologies, together with an acceleration in the pace of adopting and adapting them, would likely help maintain high profit margins in the technology sector in the period ahead. However, as technology firms exhaust investment opportunities and face increased competition, investors should expect to see some erosion of profit margins and earnings growth over time.

10. In fact, technology stocks appear to be the most sensitive to changes in earnings growth, the risk-free interest rate, and the equity premium.[8] The constant growth valuation model shows that the price-earnings ratio is extremely sensitive to changes in the discount interest rate (r) or the growth rate of earnings per share (g), when these variables have values close to each other, as seems to be the case for most of the S&P500 industrial stocks. The results (Table 7) show that the elasticity of price-earnings ratio to changes in expected earnings growth, the risk-free interest rate, and the equity premium, is higher for industrial stocks than for financials, transportation, and utilities. These high elasticities in the industrial sector primarily reflect extremely high price levels for technology, health care, and consumer cyclicals and staples (Table 8).

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[8] The elasticities of the price-earnings ratio to earnings per share growth (η_g), the risk-free rate (η_{rf}), and the equity premium (η_ρ), are defined as follows:

$$\eta_g = \frac{\partial(P/E)}{\partial g} \cdot \frac{g}{P/E} = \frac{g}{r-g}$$

$$\eta_{rf} = \frac{\partial(P/E)}{\partial rf} \cdot \frac{rf}{P/E} = \frac{-rf}{r-g}$$

$$\eta_\rho = \frac{\partial(P/E)}{\partial \rho} \cdot \frac{\rho}{P/E} = \frac{-\rho}{r-g}$$

where ρ is the equity-risk premium and $r = rf + \rho$.

Table 1. United States: Price-Earnings Ratio, Dividend-Payout Ratio, and Real Earnings for S&P500 Stocks

	S&P500 Index				
	Overall	Industrial	Financial	Trans-portation	Utilities
Price-earnings ratio					
1954–94 1/	16.7	17.4	12.5	22.2	15.8
1999	31.2	37.0	18.7	17.0	17.9
Dividend-payout ratio					
1954–94 1/	55.4	54.1	44.0	48.0	80.2
1999	38.9	40.0	31.1	18.7	72.5
Real earnings 2/ (annual growth)					
195494 1/	2.8	3.1	5.7 3/	8.9 3/	0.8
1995–99	7.7	6.9	11.4	16.3	2.7

Source: Staff estimates.

1/ Average over 1954–94, excluding the higher inflation subperiod of 1970–84.

2/ Earnings per share deflated by the chain-type GDP deflator. Data since 1954, except for financials.

3/ For financial based on NIPA figures for corporate profits. For transportation, based on EPS during 1978–94.

Table 2. United States: Alternative Scenarios for Real Earnings and Risk Premium

	S&P500 Index				
	Overall	Industrial	Financial	Trans-portation	Utilities
	I. Expected Real-Earnings Growth				
Equity-risk premium					
At 3 percent	5.5	5.9	5.0	4.5	2.9
At 4.5 percent	7.2	7.5	6.5	6.1	4.6
At 6 percent	8.7	9.0	8.1	7.6	6.0
	II. Implied Equity-Risk Premium				
Real-earnings growth (1954–94 average)	0.4	0.4	3.7	7.2	1.0

Source: Staff estimates.

Table 3. United States: Price-Earnings Ratio, Dividend-Payout Ratio, and Real Earnings for S&P500 Industrial Stocks

S&P500 Industrial Index

	Basic Materials	Capital Goods	Commu-nication Services	Consumer Cyclicals	Consumer Staples	Energy	Health Care	Tech-nology
Price-earnings ratio								
1994–99 1/	24.6	29.5	26.0	18.9	28.1	27.2	30.1	33.0
1999	35.9	29.6	37.6	23.6	33.7	54.3	39.6	51.2
Dividend-payout ratio (in percent)								
1994–99 1/	48.2	45.1	62.7	28.3	43.8	75.9	42.3	12.9
1999	67.5	38.9	54.5	25.5	44.8	132.0	42.6	11.2
Real earnings2/ (annual growth)								
1987–94	...	...	...	...	...	6.2	7.9	0.3
1994–99 1/	-4.1	20.6	5.9	6.6	6.4	7.0	8.2	11.5
1999	6.6	20.0	44.7	23.1	10.6	116.1	15.3	53.9

Source: Staff estimates.

1/ Average over 1954–94, excluding the higher inflation subperiod of 1970–84.
2/ Earnings per share deflated by the chain-type GDP deflator. Data since 1954, except for financials.

Table 4. United States: Alternative Scenarios for Expected Real Earnings and Risk Premium

S&P500 Industrial Index

	Basic Materials	Capital Goods	Commu-nication Services	Consumer Cyclicals	Consumer Staples	Energy	Health Care	Tech-nology
Equity-risk premium								
At 3 percent	6.0	5.8	5.7	6.1	6.0	5.9	6.2	7.0
At 4.5 percent	7.5	7.3	6.7	7.6	7.5	7.4	7.7	8.5
At 6 percent	9.1	8.9	8.8	9.2	9.1	9.0	9.4	10.2
Real-earnings growth (1954–94 average for industrial sector)	0.3	0.5	1.0	0.2	0.3	0.3	0.0	-0.7

Source: Staff estimates.

Table 5: United States: Price-Earnings Ratio, Dividend-Payout Ratio, and Real Earnings for S&P500 Technology Stocks
S&P500 Technology Index

	Communications Equipment	Computers				Electronics				Equipment Semi Conductors 1/	Photography Imaging	Services	
		Hardware	Networking	Peripherals 1/	Software & Services	Distributors	Component Defense	Instrumentation	Semi Conductors			Computer Systems	Data Processing
Price-earnings ratio													
1994–99	46.0	27.8	67.4	40.8	45.8	20.1	22.4	35.4	27.8	30.8	27.4	29.7	31.3
1999	78.8	39.0	95.6	42.6	59.2	20.9	27.6	69.0	45.7	58.6	24.0	42.4	32.1
Dividend-payout ratio (in percent)													
1994–99	15.9	...	...	...	2.8	25.9	34.4	38.8	6.0	...	57.0	43.0	12.1
1999	16.8	...	...	...	0.9	27.2	44.0	61.9	6.4	...	46.9	42.8	17.0
Real earnings 2/ (annual growth, in percent)													
1985–94	0.9	-13.3	...	...	9.2	...	...	6.3	11.5	...	...	...	...
1994–99	9.5	30.9	50.1	24.4	24.1	7.2	-4.9	0.9	11.9	17.5	17.5	0.5	10.3
1999	139.3	70.2	96.1	178.8	10.4	-22.3	-56.4	55.2	47.6	681.6	59.6	-29.8	43.4

Source: Staff estimates.
1/ Price-earnings ratio and real earnings based on average during 1996–99.
2/ Earnings per share deflated by the change in the chain-type GDP deflator.

Table 6. United States: Alternative Scenarios for Expected Real Earnings and Risk Premium
S&P500 Technology Index

	Communications Equipment	Computers				Electronics				Equipment Semi Conductors	Photography Imaging	Services	
		Hardware	Networking	Peripherals	Software & Services	Distributors	Component Defense	Instrumentation	Semi Conductors			Computer Systems	Data Processing
						I. Expected Real-Earnings Growth							
Equity-risk premium													
At 3 percent	7.1	9.3	9.6	9.4	9.6	8.5	8.4	9.1	9.6	9.5	7.3	8.7	9.3
At 4.5 percent	8.6	10.9	11.2	11.0	11.2	10.1	10.0	10.7	11.2	11.1	8.9	10.3	10.9
At 6 percent	10.2	12.5	12.8	12.6	12.8	11.7	11.6	12.3	12.8	12.7	10.5	11.9	12.5
						II. Implied Equity-Risk Premium							
Real-earnings growth													
1954–94 average for Industrial sector	-0.8	-0.6	-0.8	-0.7	-0.9	0.2	0.2	-0.4	-0.8	-0.8	1.3	0.0	-0.6

Source: Staff estimates.

Table 7. United States: Estimated Elasticity of Current Price-Earnings Ratio 1/

	S&P500 Index				
	Overall	Industrial	Financial	Trans-portation	Utilities
I. To Changes in Expected Real-Earnings Growth					
Equity-risk premium					
At 3 percent	4.5	5.6	3.1	2.4	1.2
At 4.5 percent	5.4	6.7	3.8	3.0	1.5
At 6 percent	6.3	7.8	4.5	3.6	1.9
II. To Changes in the Equity-Risk Premium					
Equity-risk premium					
At 3 percent	-1.7	-2.1	-1.3	-1.1	-0.7
At 4.5 percent	-2.5	-3.1	-1.9	-1.6	-1.0
At 6 percent	-3.4	-4.1	-2.6	-2.1	-1.3
III. To Changes in the Risk-Free Rate					
Risk-free rate at 6.5 percent	-3.7	-4.4	-2.8	-2.3	-1.5

Source: Staff estimates.

1/ In theory, and based on historical data for the S&P500, the elasticities of the P/E ratio to changes in expected real earnings and the risk-free rate should range between 0.9–1.9 (depending on the equity premium, which ranges from 3 to 6 percent). The estimated elasticity with respect to changes in the equity Premium should be -1.

Table 8. United States: Estimated Elasticities of Current Price-Earnings Ratio

	S&P500 Industrial Index							
	Basic Materials	Capital Goods	Commu-nication Services	Consumer		Energy	Health Care	Tech-nology
				Cyclicals	Staples			
I. To Changes in Expected Real-Earnings Growth								
Equity-risk premium	6.2	5.4	4.8	7.1	6.5	5.9	8.1	37.5
At 3 percent	7.4	6.4	5.8	8.4	7.7	7.1	9.6	43.8
At 4.5 percent	8.6	7.5	6.7	9.8	8.9	8.2	11.1	50.2
At 6 percent								
II. To Changes in the Equity-Risk Premium								
Equity-risk premium	-2.2	-2.0	-1.8	-2.5	-2.3	-2.2	-2.8	-11.9
At 3 percent	-3.4	-3.0	-2.1	-3.8	-3.5	-3.2	-5.6	-17.9
At 4.5 percent	-4.5	-3.9	-3.6	-5.0	-4.6	-4.3	-4.2	-23.8
At 6 percent								
III. To Changes in the Risk-Free Rate								
Risk-free rate at 6.5 percent	-4.8	-4.3	-3.9	-5.4	-5.0	-4.7	-6.1	-25.8

Source: Staff estimates.

V. How Does U.S. Monetary Policy Influence Economic Conditions in Emerging Markets?[1]

1. Given the integration of global capital markets, changes in U.S. monetary policy are felt almost immediately by developing countries through effects on the cost and availability of funds. In addition to the direct impact of changes in U.S. interest rates on rates in developing countries, interest rate spreads (the differences between yields on sovereign bonds of developing countries and U.S. Treasury securities of comparable maturities, which are a proxy for country risk) move in the same direction as the changes in U.S. interest rates. This effect on developing country spreads was seen clearly in 1994 when a tightening of U.S. monetary policy was reflected in a substantial widening of spreads, and in 1998 when an easing of U.S. monetary policy in response to the flight to quality following the Russian default reduced spreads somewhat.

2. The empirical evidence on interest rate spreads presented here suggests that country-specific fundamentals are important in explaining fluctuations in developing country interest rates spreads, but also important is the stance and predictability of U.S. monetary policy. To the extent that monetary policy actions can be anticipated by market participants, market turbulence would likely be reduced, and therefore one conclusion that can be drawn from the analysis is that an approach to monetary policy that provides financial markets with clear indications of the U.S. authorities' intentions is likely to reduce the impact of a U.S. rate increase on developing countries. The direct effects of a change in U.S. monetary policy on income and domestic demand of developing countries as a group also was simulated using Multimod. The simulations indicate that a 100 basis point increase in U.S. interest rates will reduce developing countries' GNP and domestic demand by ½ percent per year.

A. Long-Run Determinants of Sovereign Spreads in Emerging Markets

3. The existing empirical literature is far from conclusive on how U.S. monetary policy affects emerging market sovereign spreads. Most of the specifications adopted so far have been somewhat simplistic, proxying U.S. monetary policy by the level of the three-month U.S. Treasury bill yield.[2] Eichengreen and Mody (1998) found, for a sample of Latin American and East Asian countries during 1991–95, that a rise in U.S. Treasury interest rates tended to reduce spreads, perhaps because it deterred less-creditworthy borrowers from issuing bonds.

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[1] Prepared by Vivek Arora, Martin Cerisola, and Victor Culiuc.

[2] Shocks to the three-month Treasury bill rate do not always imply changes in U.S. monetary policy. The so-called "flight to quality" experienced during the Asian crisis has been quite revealing in terms of fluctuations in U.S. Treasury bill yields in the absence of changes in U.S. monetary policy, as well as how changes in U.S. short-term rates affect sovereign spreads in emerging markets.

They found that while the level of sovereign spreads was determined largely by fundamentals, changes in sovereign spreads were also driven significantly by market sentiment. Cline and Barnes (1997) found a positive but statistically insignificant effect of U.S. Treasury yields on sovereign spreads in selected emerging markets during the mid-1990s, a finding shared by Kamin and Kleist (1997).

4. An econometric model for sovereign bond spreads was estimated individually for a group of emerging market countries.[3] The model explains fluctuations in spreads as a function of country-specific macroeconomic variables, the level of the U.S. federal funds target rate, and a proxy for market volatility. The proxy for market volatility is intended to capture changes in investor sentiment which may be related to expected changes in U.S. monetary policy. It may also pick up the effects of other market-related events, such as the so-called "flight to quality" effects.[4] The results show that the level of the U.S. federal funds target rate has significant positive effects on emerging market spreads, with the estimated elasticity ranging from about ½ to 1 (Table 1).[5] The model also supports the view that increased market volatility related to heightened uncertainty about the expected path of U.S. monetary policy has significant positive effects on spreads across countries and regions.[6] However, a

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[3] The model was estimated for Argentina, Brazil, Bulgaria, Colombia, Indonesia, Korea, Mexico, Panama, Philippines, Poland, and Thailand.

[4] Market volatility was proxied by the fitted values for the conditional standard error from an Autoregressive Conditional Heteroskedasticity model (ARCH) for the spread between the three-month yield on the U.S. Treasury bill and the federal funds target rate. ARCH models are useful in analyzing financial data because they capture the persistence that is observed in many financial time series. In particular, large shocks tend to be followed by large shocks of unpredictable sign, suggesting that there is persistence in market volatility, a notion that the ARCH methodology aims at capturing.

[5] The rise in the level of emerging market interest rates will, however, not necessarily be as large as the sum of the rise in spreads and the rise in the U.S. federal funds rate. In the United States, the yield curve tends to flatten as monetary policy is tightened, so that a rise in short-term interest rates is not fully passed through to longer-term rates.

[6] Several proxies for market volatility were used for estimating the model, and the results are somewhat sensitive to the chosen proxy. The results based on a six-month moving average of standard deviations for the spread between the three-month yield on the Treasury bill and the federal funds target rate was highly statistically significant across countries. However, the validity of this proxy for volatility has been questioned in the empirical literature by Hsieh and Miller (1990) on the basis of inducing a spurious correlation between variables due to its high serial correlation. An alternative proxy, the standard deviation of the daily spread within a month, was not statistically significant, except for Argentina, Bulgaria, and Indonesia.

significant proportion of fluctuations in emerging market spreads is driven by country-specific fundamentals. In particular, the results suggest that improved macroeconomic fundamentals, such as higher net foreign assets (in terms of GDP or imports), lower fiscal deficits, and lower ratios of debt service to exports and debt to GDP, help to lower sovereign spreads.

5. The model presented in Table 1 explains fluctuations in emerging market sovereign spreads relatively well for most countries (Figure 1). In particular, the model explains roughly between half and three-quarters of the fluctuations in spreads for most countries. However, the model is subject to a structural break in late 1995 in several countries (Figure 2). Specifically, in the cases of Argentina, Brazil, Mexico, Philippines, Bulgaria, and Poland, the model fails to fully account for the sharp narrowing of spreads that took place during the period leading up to the Asian crisis. The narrowing of sovereign spreads between the first half of 1996 and mid-1997 was particularly pronounced in these countries, and may have been associated more with changes in market access and with global portfolio shifts by institutional investors than with country-specific fundamentals.[7]

B. Macroeconomic Effects of U.S. Monetary Policy on Developing Countries

6. The macroeconomic effects on developing countries of a tightening in U.S. monetary policy were explored using the IMF's multi-country model (Multimod).[8] A scenario that examined the macroeconomic impact on developing countries of an increase in the U.S.

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[7] Several countries, like Argentina and Mexico, became very active in issuing yen-denominated bonds in the Japanese market. Access was eased by regulatory changes in this market, which eliminated restrictions on the sale of sovereign yen-denominated Eurobond issues to Japanese investors in 1994 and reduced the minimum credit rating requirement for Samurai bonds in 1996. The model was extended to capture these events by including the Hodrick-Prescott cyclical component of the number of yen-denominated sovereign bond issues during this period. A significant (but very small) negative effect was found for some of those countries, particularly Argentina and Mexico. In addition, the results for Asian countries (except the Philippines) should be interpreted with some caution given the relatively small sample size.

[8] See Laxton et al. (1998) for a discussion of Multimod, and Laxton and Prasad (2000) for a Multimod-based analysis of the effects of macroeconomic shocks in the United States on major industrial countries. A tightening of U.S. monetary policy would in general be expected to reduce the availability of, and raise the interest rate on, credit for developing countries. In Multimod, the reduction in credit to developing countries is modeled by a tightening of the financing constraint faced by debtor countries that depends (inversely) on the ratio of expected debt service to exports. An increase in U.S. interest rates, by raising the debt-service ratio, reduces the availability of financing. The spread (risk premium) on developing country credit is not explicitly modeled in Multimod.

federal funds rate of 100 basis points relative to the baseline was simulated over a ten-year period starting in 2000 (Table 2).[9] The baseline was represented by the central forecast in the May 2000 World Economic Outlook exercise. In order to focus on the effects of a U.S. monetary policy tightening, the interest rate increase was assumed to be exogenous (rather than, for example, a response to rapid U.S. demand growth). The simulation shows that for developing countries as a whole the rise in U.S. interest rates would lead to a reduction in real GNP and domestic demand relative to the baseline of nearly ½ percent annually over the medium term. Because interest rates are assumed in Multimod to affect real activity and debt service with a lag, the effects of higher interest rates are larger over the medium term than immediately upon impact.

7. Among developing countries, there is a substantial difference between the macroeconomic impact on debtor and on creditor countries, with debtor countries experiencing a much larger negative impact. Debtor countries would face a rise in debt-service costs (of nearly 2 percentage points in the first few years) and a tightening in their financing constraint, and the rise in debt service would require a rise in the net exports of these countries.[10] Higher interest payments, together with the tightening of the financing constraint, would in turn contribute to a sharp reduction in domestic demand, with both consumption and investment falling relative to the baseline. The overall impact would be to reduce GNP and domestic demand by ½ percent annually. This is roughly the same as the total impact on developing countries because debtor countries account for an overwhelming proportion (around 90 percent) of the GNP of developing countries. The creditor countries, in contrast, would experience a positive wealth effect arising from higher returns on their net foreign assets. The higher returns would allow domestic demand and GNP to rise relative to the baseline by ¼ percent and ½ percent, respectively, annually over the medium term. A reduction in the trade balance of these countries would be partly offset by higher interest receipts, allowing the current account balance to improve slightly over the medium term.

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[9] The ten-year period was chosen so as to allow an assessment of the medium-term effects. Multimod does not have any significant nonlinearities regarding the effects of U.S. interest rate increases on developing countries. Alternative simulations with interest rate increases of 200 and 300 basis points suggest that the effects on output, domestic demand, and other macroeconomic variables in developing countries are roughly two and three times as large, respectively, as in the 100 basis point case.

[10] The increase in the trade balance for these countries relative to the baseline would be offset by higher interest payments, leaving the current account balance roughly unchanged.

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Table 1: Determinants of Sovereign Bond Spreads for Selected Emerging Markets

Period	Argentina 1994:4–99:12	Brazil 1994:4–99:12	Mexico 1994:4–99:12	Panama 1996:8–99:12	Colombia 1997:4–99:12	Poland 1994:11–99:12	Bulgaria 1995:06–99:12	Philippines 1994:4–99:12	Thailand 1997:11–99:12	Korea 1998:7–99:12	Indonesia 1997:5–99:12
U.S. federal funds rate	0.54	0.95	0.93	0.26	0.54	1.26	1.09	0.57	0.63	1.45	0.78
	(.000)	(.000)	(.000)	(.052)	(.000)	(.000)	(.000)	(.000)	(.001)	(.000)	(.000)
Market volatility 1/	0.08	0.05	0.07	-0.01	0.05	0.05	0.03	0.04	0.02	-0.01	0.16
	(.003)	(.000)	(.013)	(.411)	(.000)	(.001)	(.150)	(.093)	(.022)	(.576)	(.000)
Net foreign assets (in percent of GDP)	-0.05	...	...	-0.09	-0.38	-0.29	-0.01	...	-0.01	-0.07	...
	(.000)			(.000)	(.000)	(.036)	(.056)		(.000)	(.000)	
Fiscal balance (in percent of GDP)	...	-0.01	...	-0.08	...	...	...	...	...	...	-0.91
		(.010)		(.000)							(.000)
Gross reserves to imports	...	...	-2.04	...	...	-2.68	...	-3.00	...	...	...
			(.041)			(.001)		(.014)			
Debt service ratio	...	...	...	...	...	...	0.01	0.02	0.08	...	...
							(.027)		(.160)		
Central government debt (in percent of GDP)	0.13	0.10 2/	0.05	...	0.19	...	...	0.07	...	...	...
	(.000)	(.000)	(.000)		(.000)			(.001)			
Total external debt (in percent of GDP)	...	...	...	0.09	...	...	...	...	...	...	...
				(.000)							
Dummy 3/	...	...	...	...	...	...	-0.40	...	...	...	...
							(.000)				
Adjusted r-squared	0.51	0.55	0.45	0.62	0.81	0.54	0.60	0.37	0.78	0.81	0.82
Phillips-Perron test for Cointegration 4/	-3.77**	-2.50	-2.75*	-3.25**	-3.67**	-2.09	-4.52**	-2.22	-6.59**	-3.80**	-3.73**

Source: Staff estimates.
Probability values, for the null hypothesis of a coefficient equal to zero, are reported in parentheses.

1/ Based on the fitted conditional standard error from an ARCH model for the spread between the three-month T-bill and the federal funds rate.
2/ Refers to net debt.
3/ A dummy was included to allow for the effects associated with the introduction of a currency board in Bulgaria.
4/ Hamilton (1994) reports critical values at the 90 and 95 percent confidence level of about -2.59 and -2.912 for a sample size of 50–100 observations, respectively.
One and two asterisks imply rejection of the null hypothesis of no cointegration at the 90 and 95 percent level of significance.

Table 2. Developing Countries: Macroeconomic Effects of a 100 Basis Point Increase in the U.S. Federal Funds Interest Rate

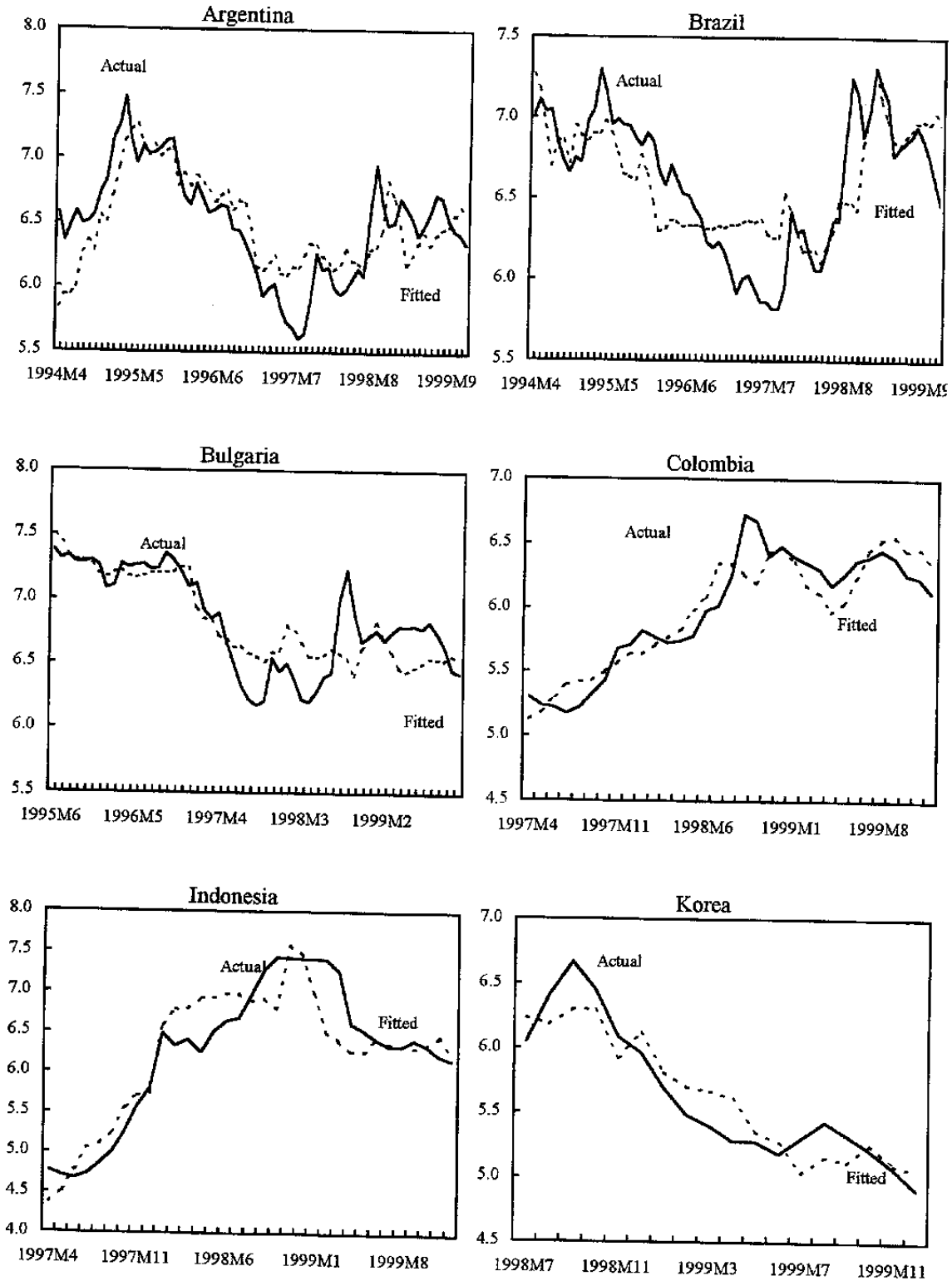
(Deviation from baseline, in percent unless otherwise noted)

	2000	2001	2002	2003	2004
Developing countries					
Real GNP	-0.2	-0.4	-0.5	-0.4	-0.4
Domestic demand	-0.3	-0.6	-0.6	-0.5	-0.3
Net debtor countries					
Real GNP	-0.2	-0.5	-0.6	-0.6	-0.6
Domestic demand	-0.4	-0.7	-0.6	-0.5	-0.4
Current account/GNP 1/	0.1	0.1	0.0	0.0	-0.1
Trade balance/GNP 1/	0.2	0.3	0.3	0.2	0.1
Net debt (billions of dollars)	-11.4	-22.1	-30.4	-35.8	-38.1
Debt service/exports 1/	0.7	1.8	1.8	1.8	1.5
Net creditor countries					
Real GNP	-0.1	0.3	0.5	0.7	0.7
Domestic demand	0.1	0.2	0.3	0.4	0.4
Current account/GNP 1/	-0.3	0.0	0.1	0.2	0.2
Trade balance/GNP 1/	-0.3	-0.5	-0.6	-0.5	-0.4
Net foreign assets/GNP 1/	0.3	0.6	1.1	1.6	2.3

Source: Staff calculations, based on WEO projections and Multimod.

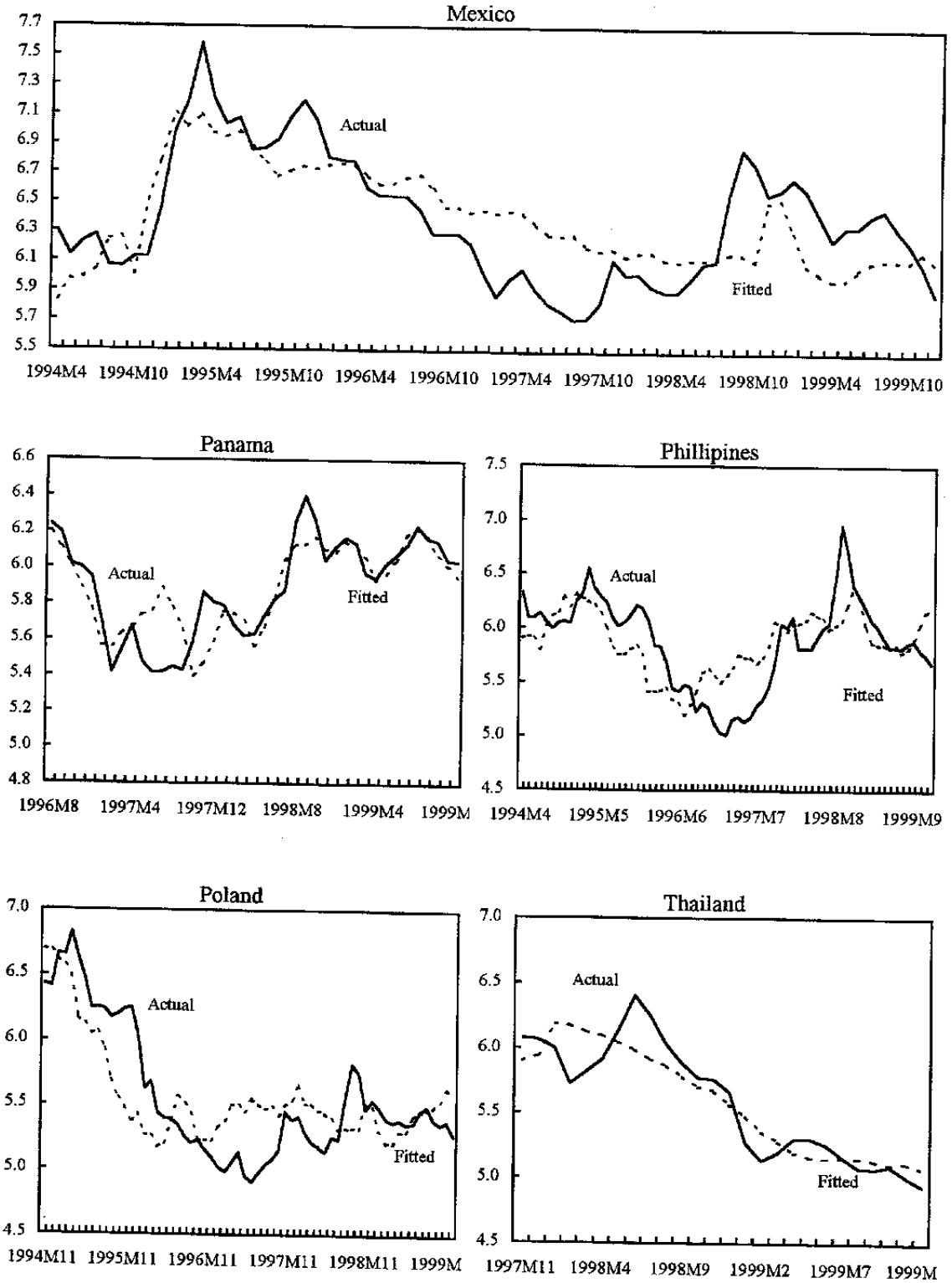
1/ Deviation from baseline in percentage points.

Figure 1. Sovereign Spreads in Selected Emerging Markets
Actual vs. Fitted Values (in logarithm)



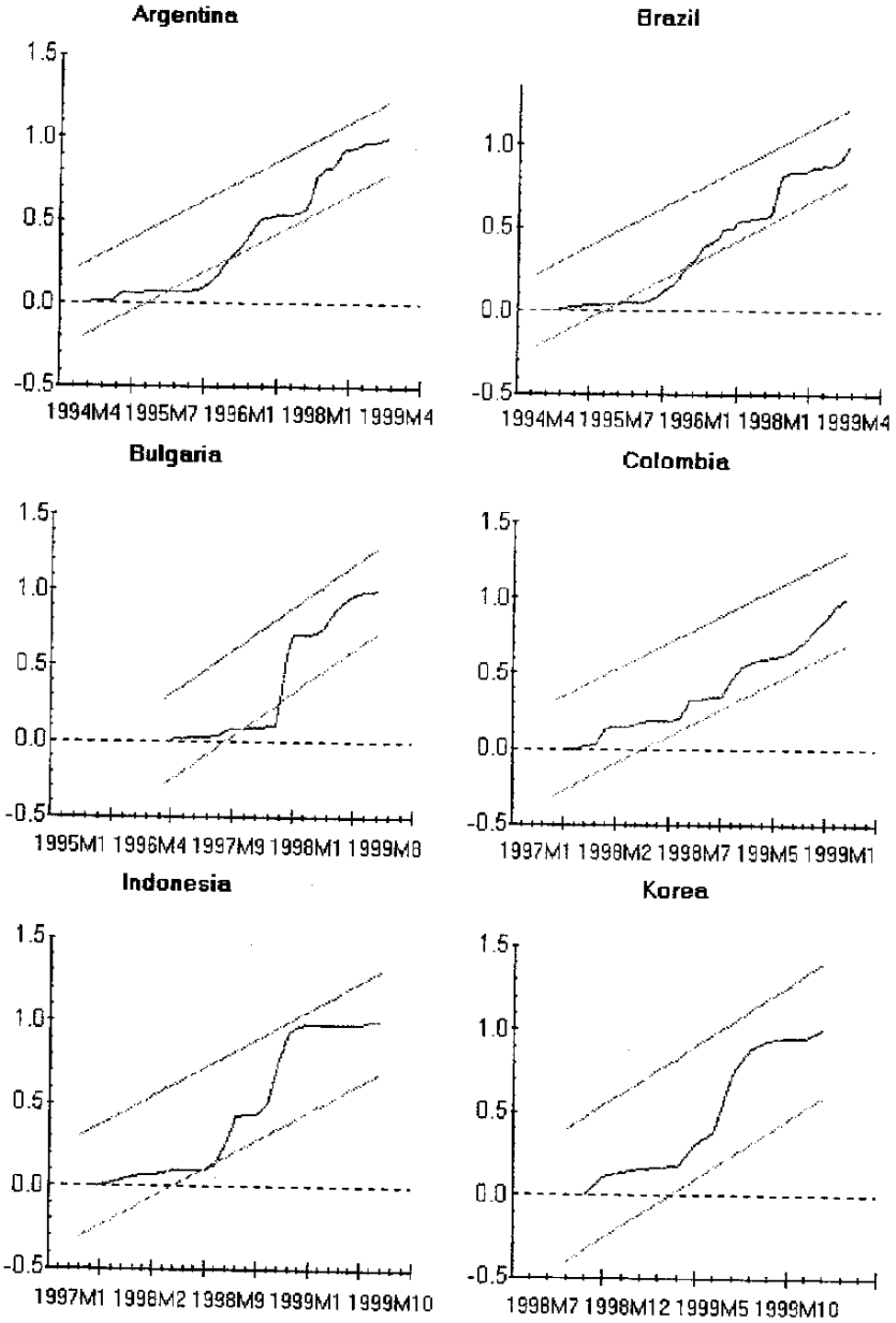
Sources: Merrill Lynch; and staff estimates.

Figure 1. Sovereign Spreads in Selected Emerging Markets
Actual vs. Fitted Values (in logarithm) (concluded)



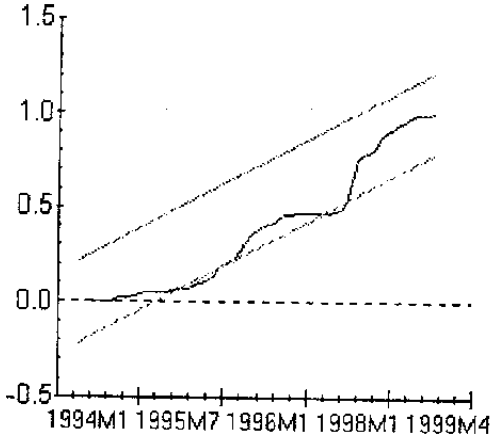
Sources: Merrill Lynch; and staff estimates.

Figure 2. Stability Tests 1/

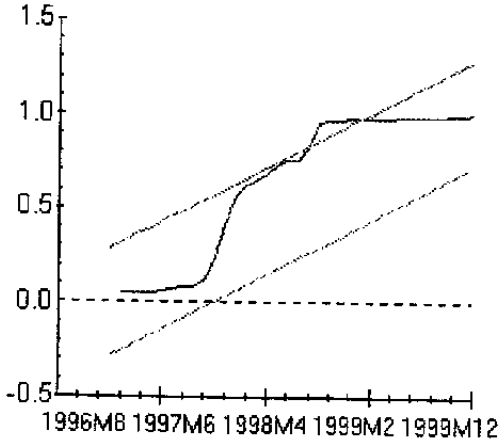


1/ Based on the cumulative sum of squared residuals statistic. Confidence bands for a 95 percent level of significance.

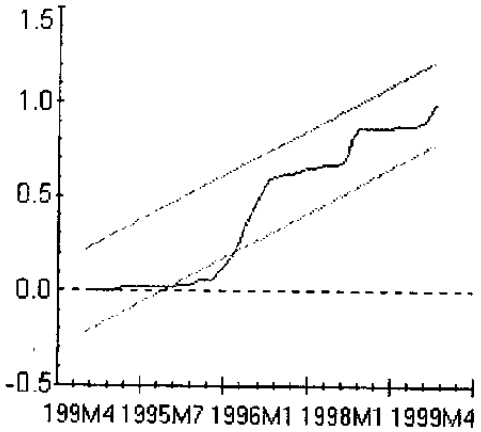
Mexico



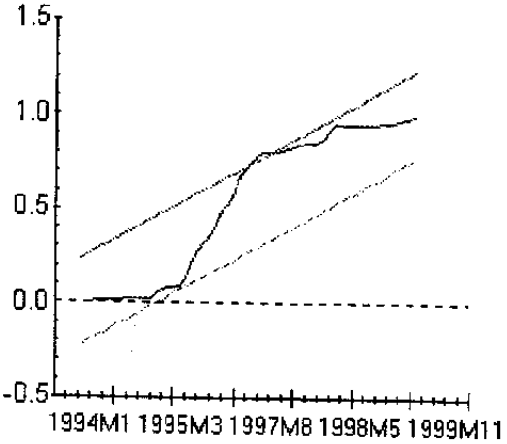
Panama



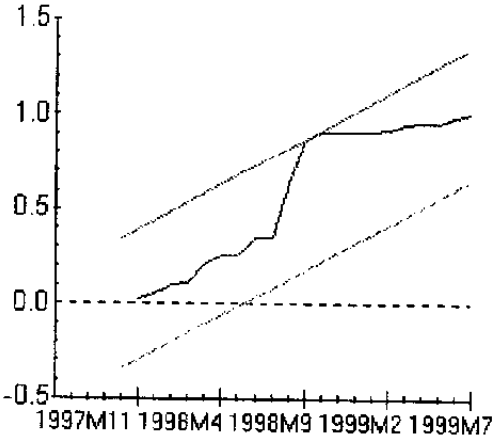
Philippines



Poland



Thailand



VI. U.S. Financial Sector Reform: The Gramm-Leach-Bliley Act[1]

1. The development of new financial products and services has increasingly blurred the characteristics that once distinguished banks, securities firms, and insurance companies from one another. At the same time, the previous banking legislation, rooted in Depression-era laws, restricted the ability of banks to underwrite and deal in securities, as well as engage in other nonbanking-type activities. Despite the laws, these restrictions were markedly eroded as various decisions were made to accommodate innovations in business practices.

2. Over the last 20 years, numerous efforts were made to modernize financial sector legislation to keep pace with the evolving market place, but these efforts were stymied by failure to reach agreement on legislation until the Gramm-Leach-Bliley (GLB) Act was enacted in November 1999. In particular, the Act repealed Section 20 of the Glass-Steagall Act of 1933 which had restricted affiliation between banks, securities firms, insurance companies, and other financial service providers, and modified the Bank Holding Act of 1956 to allow companies that own commercial banks to engage in any type of financial activity.[2] This paper reviews recent developments in financial consolidation; discusses the key provisions contained in the GLB Act; and explores the implications of the GLB Act for further financial consolidation and regulatory and supervisory practices.

A. Recent Trends in Financial Consolidation

3. Since the 1970s, the role for commercial banks in providing credit to U.S. businesses has decreased markedly, as competing financial institutions and the securities markets have accounted for a growing share of business funding.[3] By the mid-1990s, debt securities accounted for more than four times as much financing for U.S. corporations than did bank loans, whereas in most other industrial countries, bank loans were a much more important source of funding than debt (Figure 1).

4. Debt instruments in the United States have also become more marketable, as the proportion of corporate bonds issued in public markets rose to about 85 percent by the early 1990s from about 70 percent in the late 1960s. At the same time, the process of securitization—whereby loans on bank balance sheets are transformed into tradable securities—has also spread to a broader range of loan types since the 1970s, beginning first with mortgages, and then consumer and business loans. Securitization has meant that loans

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[1] Prepared by Paula R. De Masi.

[2] The provisions are not effective immediately on the date of signing but will take effect between 3 and 18 months following enactment.

[3] The decreased role of banks is particularly noteworthy for larger corporations, which are more able to tap the securities markets to satisfy short- and long-term financing needs.

which originate with banks are sold off to mutual funds, pension funds, and other investors, with the result that a larger share of financial assets are held by nonbank intermediaries. Banks' share of total assets held by financial intermediaries declined to about 24 percent in the late 1990s from about 37 percent in the early 1980s.

5. Consolidation in the banking industry has also been occurring at a rapid pace.[4] During the 1990s, the number of U.S. credit insitutions declined by about 30 percent. As a result, the share of assets held by the five largest banks increased from about 9 percent to about 17 percent, although by comparison with most other industrical countries, concentration in U.S. banking remains low (Figure 2). Underlying these broad trends are structural changes within the U.S. banking industry. Although the number of mergers and acquisitions has declined by more than half from its peak in 1994, the number of "mega mergers"—that is mergers and acquisitions between institutions with assets over $1 billion each—has been on the rise.[5] In contrast, bank failures have declined markedly during the 1990s, and as the banking sector's profitability picked up in the mid-1990s, entry of new banks has risen. Consolidation is also underway in other segments of the financial services industry, however, to a far lesser extent than in banking. For example, compared to the late 1980s, the securities and life insurance sectors have become somewhat less concentrated, while the property-liability insurance sector has become more concentrated.

6. Supporting U.S. financial consolidation over the last two decades were a number of *ad hoc* decisions relaxing some of the restrictions of the U.S. regulatory environment. For example, since the 1980s, the federal restrictions on interstate banking had eroded as states began to pass legislation which allowed the entry of out-of-state bank-holding companies through the acquisition of an existing bank. In an effort to catch up with the realities of interstate banking, the Riegle-Neal Act of 1994 eliminated most of the remaining impediments to interstate banking and branching. The restrictions that separated commercial banking from securities and insurance activities had eroded as well. In the late 1980s, the Federal Reserve allowed commercial bank-holding companies to participate in debt and equity underwriting on a limited basis through what were termed Section 20 affiliates.[6]

7. The GLB Act eliminates the remaining restrictions on affiliations between commercial banks and securities and insurance firms, and perhaps most importantly, eliminates the legal

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[4] For a detailed discussion see Berger, Demsetz, and Strahan (1999).

[5] Nine of the ten largest mergers and acquisitions in history in any industry took place in 1998, and four of these were in the banking industry.

[6] The underwriting revenues from Section 20 affiliates were originally restricted to 5 percent of the subsidiary's total revenue, but this amount was raised in two steps to 25 percent by 1996. The Federal Reserve also allowed banks to merge with large securities firms in 1996.

uncertainties, the need for special rulings and other barriers which have hindered financial services companies from offering various products and services.[7] Rather than viewed as a sea-change in U.S. regulatory policy, the GLB Act modernizes the regulatory framework so that it more accurately reflects the current state of business practices in the financial services industry.

B. Key provisions of the Gramm-Leach-Bliley Act

8. The centerpiece of the GLB Act is the creation of a new "financial holding company" (FHC) structure (Table 1).[8] A FHC is similar to a bank-holding company in that it satisfies certain new regulatory conditions, which include ensuring that the depository institutions are well capitalized and well managed.[9] However, unlike bank-holding companies, a FHC is not required to secure prior approval from the Federal Reserve to engage in nonbanking financial activities. Instead, an "after the fact" notice must be filed within 30 days. Eliminating the need for prior approval will significantly reduce the regulatory burden.

9. The Act allows FHCs to engage in a broad range of financial activities, including all securities underwriting and dealing, all insurance underwriting and sales, merchant banking, and equity investment. In addition, FHCs may also participate in certain nonfinancial activities, if the Federal Reserve rules that the activity is complementary and does not pose a substantial risk to the FHC's commercial banking affiliate. Such activities could possibly include real estate management, commodity trading, leasing, and accounting and auditing services.[10]

10. Another important feature of the GLB Act is that it provides banks an alternative to the FHC structure for engaging in new financial activities. National banks are now authorized to own or invest in a new type of subsidiary called a "financial subsidiary." Generally, a financial subsidiary can participate in the same newly authorized financial activities as FHCs, with the important exceptions of insurance underwriting, real estate development, and investment, merchant banking, or other complementary activities. Foreign banks operating in

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[7] For a more detailed discussion, see *The CEO's Guide to Financial Reform* (2000).

[8] The FHC is also the channel through which a nonbanking financial company (for example, a securities or insurance company) is able to purchase a bank.

[9] In addition, the depository institutions must have been rated "satisfactory" or "better" in their most recent Community Reinvestment Act examinations.

[10] Unitary thrift institutions that already combine banking and nonfinancial commercial activities will be allowed to continue this practice, and also maintain the right to acquire commercial firms. However, if the thrift is sold, then this practice must be discontinued. Also, newly chartered thrifts will not be able to combine banking with commerce. FHCs will be the only entity able to engage in nonfinancial activities.

the United States are also eligible to become FHCs in order to engage in the new range of authorized financial activities, but they are required to meet the same capital and management criteria as domestic banks.

11. With regard to banking supervision, the GLB Act empowers the Federal Reserve Board to be the "umbrella" supervisor for the financial holding companies. At the same time, the Act limits the Federal Reserve's authority over the FHCs—the so-called "Fed-lite" provision—in that the functional regulators would continue to supervise the operating affiliates of the FHCs falling under their jurisdiction.[11] While providing broad guidelines, the Act does not specifically lay out how umbrella and functional supervision should be implemented in practice, and how the activities of the various regulators and supervisors are to be coordinated.

C. Implications of the Gramm-Leach-Bliley Act

Impact on domestic financial services firms

12. The GLB Act dismantles the legal barriers between banking, securities, and insurance firms, offering more opportunities for firms to expand into new markets, diversify, and take advantage of economies of scope. The ability of a financial services firm to cross-sell a broad range of financial services and products offers the promise of enhanced efficiency and profitability. With greater legal certainty, and the prospects of greater profitability, consolidation among financial institutions is expected to continue, but many market observers do not expect consolidation to increase dramatically just because of the new legislation. Much of this activity was already taking place, as *ad hoc* regulatory changes since the 1980s had accommodated consolidation in many different forms.[12]

13. Although banks and securities underwriters have been allowed to affiliate with one another since the late 1980s, this practice was granted on a limited basis, and underwriting could only account for 25 percent of the subsidiaries' total revenue. The GLB Act eliminates this restriction and allows bank-holding companies greater freedom in structuring their portfolios. The GLB Act also allows securities firms, for the first time, the option to buy banks. With the exception of the very largest securities firms, however, banks may be more likely to acquire securities companies, rather than vice versa, because banks tend to have

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[11] Functional regulators include the other federal banking agencies (such as the Office of the Comptroller of the Currency), the Securities and Exchange Commission, the Commodity Futures Trading Commission, and the state-level insurance commissioners.

[12] For a more detailed discussion, see Moody's Investors Service (2000).

larger capital bases. However, a sharp increase in the pace of consolidation is unlikely, since banks already had the option to buy securities firms.[13]

Impact on foreign banks

14. In the past, although U.S. banks were allowed to affiliate with securities firms and insurance companies on a limited basis, foreign banks that were engaged in the insurance business have been prohibited from acquiring U.S. banks. With the GLB Act, any foreign financial company will be able to acquire a U.S. bank, which will in effect eliminate the long-standing barriers to foreign insurance companies operating in the United States. Foreign financial institutions, however, have expressed some concerns that the GLB Act's procedures for establishing a financial holding company could potentially be discriminatory, depending on how these procedures are implemented.[14] In particular, they argue that the well-capitalized standard applied to foreign banks is unduly harsh because the U.S. employs higher capital requirements than those adopted by many foreign countries under the Basel Accord on Capital.[15] Recognizing the difficulties that foreign banks may encounter because of national difference in capital standards, the Federal Reserve has adopted a flexible approach in dealing with foreign bank FHC applications to ensure fair treatment. If a foreign bank does not meet the well-capitalized standard, then the Federal Reserve considers applications on a case-by-case basis—taking into account differences in asset composition, debt ratings, or any other relevant information—to demonstrate comparable asset strength.

Changes in supervisory responsibilities

15. The rationale behind confirming the Federal Reserve as the umbrella supervisor for financial holding companies is that large financial services companies manage risk on a consolidated basis, and therefore it is important to understand the level of risk that the holding company potentially faces. The role of the Federal Reserve will be to assess the risks that exist at the holding company level that could impinge on the operating entities, and also to identify risks that exist across entities that have the potential to affect the holding companies and their affiliated banks. Therefore, the Federal Reserve, as the umbrella supervisor, faces an inherent tension of protecting the FHC and its banking entities from undue risk, while avoiding supervising the nonbanking affiliates—the responsibility of the functional regulators.

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[13] For example, the largest merger of a bank and securities firm prior to the GLB Act, Citicorp and Salomon Smith Barney, faced no regulatory obstacles.

[14] See for example, Richardson (2000).

[15] In particular, the GLB Act requires that foreign banks meet a leverage ratio (that is a ratio of Tier 1 capital to total assets) that is not included in the Basle Accord.

16. Although providing broad guidelines, the Act does not specifically lay out how umbrella and functional supervision should be implemented in practice. The Federal Reserve is expected to rely as much as possible on the examinations and reports prepared by the functional regulators. Moreover, the Federal Reserve is prohibited from applying any additional capital standards to any affiliate of a FHC that is already in compliance with the capital requirements of its functional regulator. At the same time, however, the Federal Reserve has the authority, under certain circumstances, to examine any affiliate of a FHC.[16] To work effectively, the combination of umbrella and functional regulation will require open communication, and close cooperation and coordination among the various regulatory bodies.

17. The adequacy of this new arrangement will probably not be fully tested until an important entity within a FHC faces a period of stress, for example: the insolvency of an insurance subsidiary; the failure of a derivatives subsidiary; or a more broadly based market crisis which could threaten several parts of a financial holding company. In the absence of a clear plan for how the Federal Reserve and the functional regulators will cope under such circumstances—including how the Federal Reserve would gain quick access to information—such a period of stress may well reveal some shortcomings of this new regulatory framework. One source of such shortcomings is that the Federal Reserve does not have immediate access to detailed information about the exposure of insurance and securities subsidiaries even during times of market stress, and must rely on information that has been provided to the functional regulators. Unlike the Federal Reserve, the functional regulators do not operate under a mandate to ensure overall financial stability. For example, the SEC is focused on protection investors and stock market integrity, and the insurance regulators aim to protect the interests of policy holders. As a result, the reports generated by the SEC and the insurance regulators may not provide adequate information for the Federal Reserve to carry out its mandate of financial stability. However, many of the challenges to financial supervision posed by increasingly large and complex institutions were present prior to the GLB Act because of the trend toward consolidation. The focus of the Federal Reserve will continue to be on ensuring that the large complex financial institutions have sound risk-management systems in place.

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[16] The Federal Reserve Board can examine functionally regulated entities only if (i) there is reason to believe that the entity is engaged in activities that could pose risk to an affiliated depository institution; (ii) it is necessary to inform the Board about the risk-management system of the company; and (iii) the Board has reasonable cause to believe that the entity is not in compliance with the banking laws.

Proposals for the use of subordinated debt in banking supervision

18. The increasing size and complexity of U.S. banking organizations has made banking supervision and the protection of bank soundness a more complicated task. Market discipline, which aims to align regulatory incentives with market incentives, can be an effective tool in complementing bank supervision to lower the vulnerability of the financial system to systemic risk. One possible approach to strengthen market discipline that has received considerable attention recently is a policy that would require large banks to issue subordinate notes and debentures on a regular basis.[17]

19. Subordinated debt is uninsured and is among the first (after equity) of a bank's liabilities to lose value in the event that a bank encounters financial difficulties. Unlike equity, it does not benefit from the upside potential of greater risk-taking. A market for this debt already exists in the United States (about $100 billion of subordinated debt is outstanding), and empirical evidence suggests that differences in yields on this paper across issuing banks are linked to the perceived soundness of the individual banks.

20. The risk-sensitive nature of subordinated debt exerts a direct market discipline since the expectation of higher financing costs provides an incentive for a bank to refrain from engaging in excessively risky activities. It also can exert an indirect discipline when market participants and supervisory authorities monitor secondary market prices of such debt to assess the risk exposure (or potential for default) of a bank. Large negotiable CDs issued by banks already serve a similar signaling purpose. However, these securities are issued "voluntarily" by the banks, and if a bank were to encounter difficulties that could push up its cost of CDs, it might stop issuing these securities. Subordinated debt would provide a more continuous signal, since being mandatory, the bank would be forced to continue issuing this debt in such circumstances.

21. For a policy requiring issuance of subordinated debt to serve its intended purpose, a country has to have well-functioning and deep capital markets. The policy must specify that banks issue homogeneous instruments on a regular basis. Such a requirement can only be placed on large banks (possibly specified as a percentage of the banks' assets) to ensure that there is sufficient liquidity for secondary markets to function properly. Regular issuance means that not only will a bank incur a higher cost of funds if its riskiness rises, but it will be compelled to regularly disclose new information on its current financial condition and prospects, which will contribute to ongoing reappraisals of the secondary market prices of the bank's securities. The ability of banks to register security issues well in advance of when the securities are actually sold (such as so-called "shelf registration" in the United States) might limit the timeliness of data on a bank's financial condition and prospects.

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[17] For a detailed discussion of subordinated debt as a market discipline instrument, see Board of Governors of the Federal Reserve System (1999).

22. A possible disadvantage of subordinated debt as a tool of market discipline is that it could exacerbate contagion and limit supervisory discretion during times of systemic pressures. Instability in the financial markets could at times lead to flight from all subordinated debt, regardless of the soundness of the issuer, as investors generally seek to hold less risky assets. In such circumstances, lack of liquidity in the market could mean that prices do not reflect actual transactions, but only notional values. Also, in time of systemic pressures, market participants may come to expect that subordinate debt will be implicitly guaranteed by the government.

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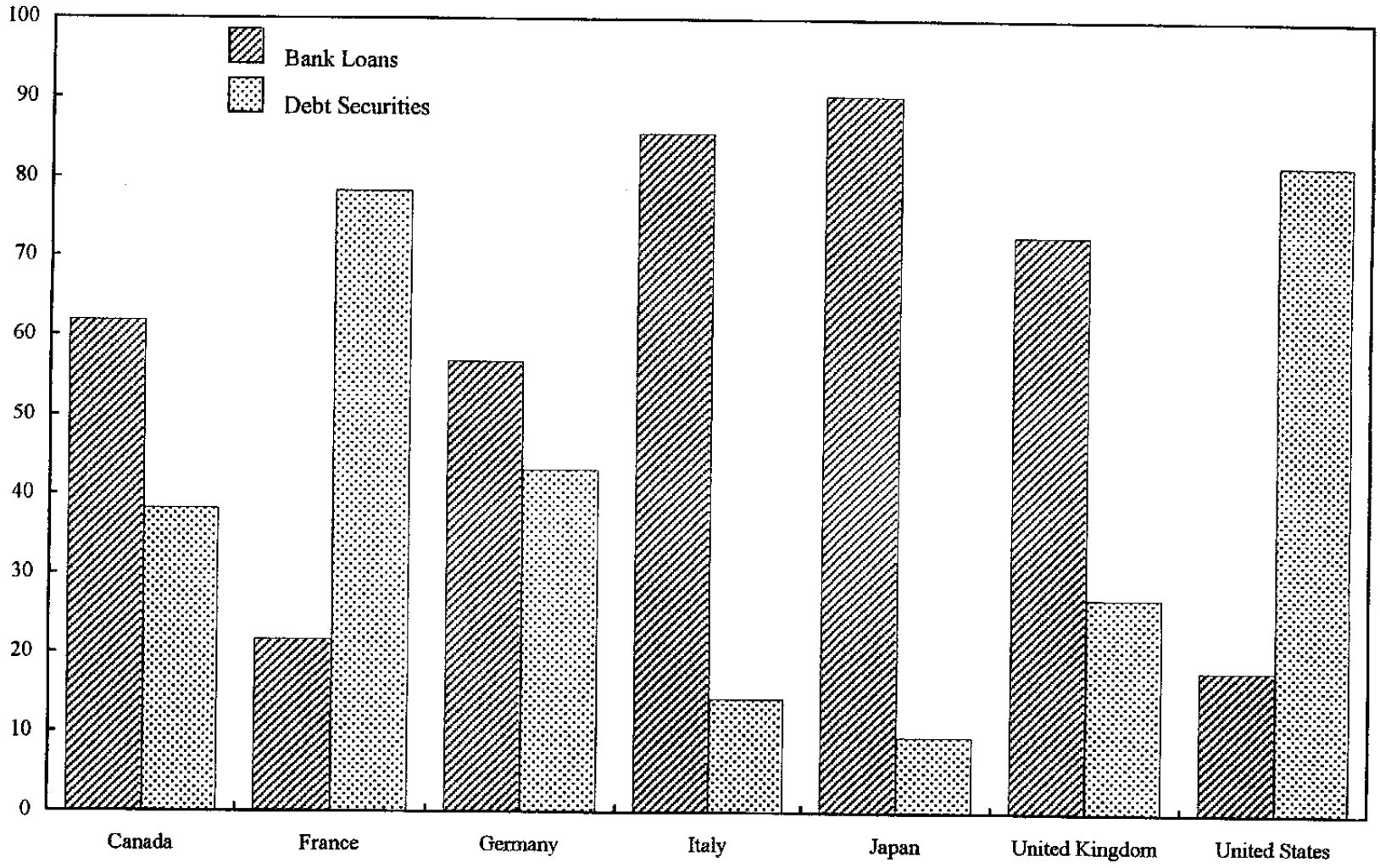
Table 1. United States: Key Provisions of the Gramm-Leach-Bliley Act

Prior to the Gramm-Leach-Bliley Act	Under the Gramm-Leach-Bliley Act
1. Activities of Holding Companies	
Bank-holding companies (BHCs) could engage in nonbanking activities deemed to be closely related to banking under the Bank Holding Company Act of 1956, but only on a limited basis. A BHCs securities subsidiaries could derive up to 25 percent of revenue from underwriting and dealing in bank ineligible securities, subject to various firewalls set up by the Federal Reserve.1/ BHCs were generally prohibited from underwriting most forms of noncredit-related insurance.	A new type of BHC—a financial holding company (FHC)—may engage in a broader range of financial activities that are outlined in the Act, determined by the Federal Reserve and in coordination with the Treasury to be financial in nature, or complementary. These activities include insurance and securities underwriting, merchant banking, and commercial investments made by insurance companies. No prior approval is required before an FHC begins to conduct these activities, but an after-the-fact notice must be filed with the Federal Reserve. However, before engaging in any of the new activities, all insured depository institution subsidiaries of the BHC must be well capitalized and well managed.
2. National Banks	
National banks were not allowed to underwrite or deal in municipal revenue bonds.	Well-capitalized national banks and their subsidiaries may underwrite and deal in revenue bonds without limitations.
National banks were allowed to have operating subsidiaries engaged in activities permissible under the National Bank Act. National banks could also have "special" operating subsidiaries which engage in activities not permissible for the parent, but are still incidental to the banking business.	The authority of national banks to have operating subsidiaries is unchanged. However, national banks may also have "financial subsidiaries" that are engaged in financially related activities that national banks cannot conduct directly. Financial subsidiaries are not allowed to engage in insurance underwriting, real estate development investment, or merchant banking.
3. Insurance	
National banks and their subsidiaries could provide insurance if the OCC determined that the activity was a part of or incidental to banking. Generally this restricted insurance underwriting activities to credit-related insurance.	National banks and their subsidiaries may not provide insurance products; title insurance (except under certain conditions) and underwriting annuities are also prohibited.
4. Savings and Loan Holding Companies	
Savings and Loan holding companies that controlled no more than one saving association were not subject to any statutory restrictions on business activities such as those imposed on multiple saving and loan companies (unitary thrift" loophole).	The "unitary thrift" loophole is closed and no company can acquire control of a savings association unless the company is engaged only in activities currently authorized for multiple thrift holding companies; or activities permissible for FHCs.

1/ Although Section 20 of the Glass-Steagall Act prohibited banks from being affiliated with firms that are principally engaged in the underwriting of securities, the Federal Reserve had interpreted this regulation to allow banks to affiliate with firms that underwrite bank impermissible securities as long as this was not a substantial part of the affiliate's business.

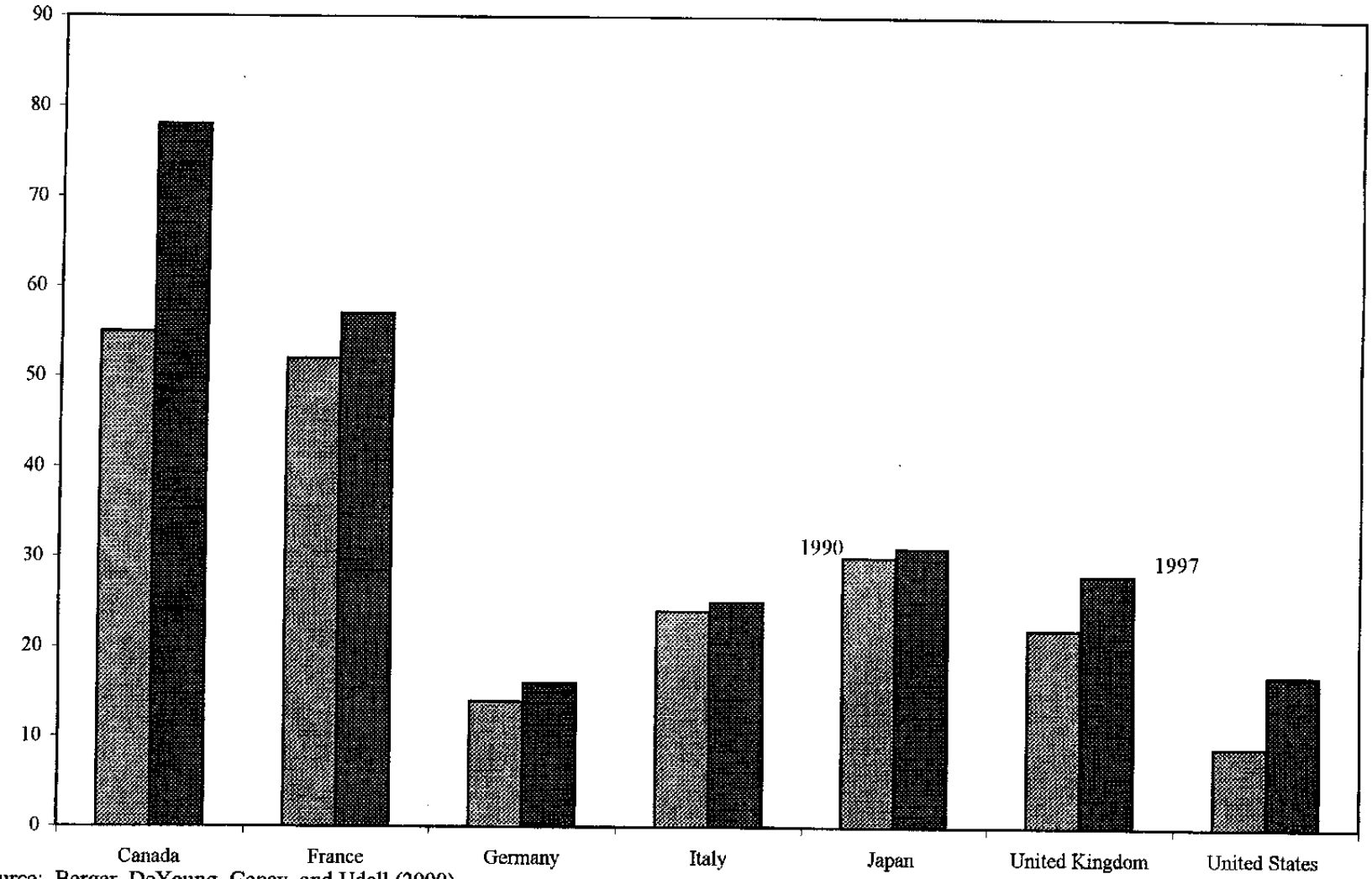
Figure 1. International Comparison:
Bank Loans and Debt Securities of Nonfinancial Firms, 1994
(as a percent of liabilities)[1]



Source: Berger, DeYoung, Genay, and Udell (2000).

[1] Liabilities equals bank loans (short- and long-term loans from depository instititutions) plus debt securities (short- and long-term bills, notes, bonds and debentures).

Figure 2. International Comparison: Banking System Concentration, 1990 and 1997 1/



Source: Berger, DeYoung, Genay, and Udell (2000).

1/ Measured as assets of the five largest institutions as a percent of total assets.