
Europe's Postwar Success and Subsequent Problems

It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change.

—Charles Darwin

To understand what reforms should be made in Europe and why they are needed it is important to understand both Europe's huge success after the end of World War II and why this success then faltered. War and economic instability devastated Europe for most of the first half of the 20th century. Western Europe has since become peaceful and prosperous, and most Europeans like the current economic system and institutions. Given the long years of economic success, resistance by the populace to major economic reforms is natural. But unless the resistance is overcome, Europe will face continued and possibly worsening economic problems.

This chapter reviews the sources of the rapid economic growth that Europe achieved through 1973 and explains how Europe developed economic policies and institutions that worked well in rebuilding damaged economies and realizing the potential growth opportunities coming from the catch-up to global best-practice business operations.

When Europe was hit by a series of structural changes or shocks, the economic system and institutions that had worked so well for so long no longer supported continued growth. In the face of these structural shocks, constraints that did not impede growth in the 1950s and 1960s became binding.

First, the opportunity for catch-up growth was either reduced or exhausted as productivity and business practices in Europe caught up to global best practices. The *easy* opportunities for rapid growth were tapped dry.¹ Second, there was a sharp slowdown in the pace of growth at the

1. Some opportunities remained but were harder to capitalize on.

productivity frontier. Although the US economy is not the best-practice standard in all industries, its slowdown in productivity after 1973 was indicative of the fact that the leading edge of productivity was moving more slowly.² The combination of these two structural changes was a double blow to European economies. Europe's private sector lost its ability to substantially increase productivity each year. Hence, the private sector's ability to pay substantially higher real wages each year *while sustaining employment levels* was also lost.³

The worldwide surge in inflation was the third structural shock that occurred in the 1970s. Although partly linked to slower productivity growth, inflation also surged because of increased wage push, excessive money growth earlier in the decade, and rapid increases in commodity prices of such items as food and oil.⁴ This inflation surge was subsequently reversed—helped by a large drop in oil prices in the 1980s—but its effect may have endured far longer. It triggered a period of stagflation and rising unemployment. Although inflation reversed, unemployment seems to have become stuck at a higher level. There are features of the European economic system that can cause a ratchet effect in unemployment.

The final, but very important, structural change affecting Europe began in the 1980s. Expanding trade with low-wage countries and technological progress reduced the relative demand for low-skilled workers. If market forces set wage rates in Europe, as largely was the case in the United States, this shift would have increased the wage gap between high- and low-wage workers. Instead, institutionally set wage rates for low-skilled jobs were kept above market levels, causing low-skilled job loss.

Any economic system would have difficulty adjusting to these structural shifts, and the 1970s and 1980s were difficult times for all the industrial countries. Many European economies found it particularly difficult to make the adjustments needed to limit or reverse the slowdown in productivity growth and to avoid an erosion of the employment base. In this chapter and chapter 3 we will look at the reasons why.

As part of this discussion, a simple model is developed that shows that when wage rates are not set by market forces and when social insurance programs are too generous or poorly designed, then an unstable employment dynamic may develop. A vicious cycle can develop in which a decline in labor supply triggers a rise in taxes on labor that causes a further decline

2. For a discussion of the slowdown and further references see Baily and Chakrabarti (1988). One important effect of the post-1973 slowdown in the United States was that productivity growth in service industries collapsed. The recovery of productivity growth after 1995 seems to have reversed that service-sector decline.

3. The data on productivity will be presented shortly. Productivity growth did not cease in Europe, but it slowed sharply.

4. The inflation problems of the 1970s actually started in the 1960s with an upward push on wages. See Nordhaus (1972).

in labor supply. This model may be useful in understanding Europe's employment pattern over the past 30 years, but it may be even more useful in describing the danger going forward. The increased proportion of the population that is elderly and receiving pension and healthcare benefits could lead to an unstable downward spiral in labor supply in the future.

What Drove Rapid Growth in Postwar Europe?

In the postwar period, Europe staged a remarkable recovery and rapid catch-up to the United States. From 1950 to 1973 real GDP per capita in the United States rose by 2.45 percent a year—a strong performance. But France grew much faster over this period, increasing its level of GDP per capita from 54 percent of the US level to 77 percent. The corresponding figures for West Germany are 49 percent to 87 percent, and 40 percent to 70 percent for Italy. West Germany's postwar recovery was particularly remarkable, given the massive destruction from the war and its division into two separate nations as the Cold War emerged. Britain started in 1950 with a much higher income level than the rest of Europe, at 73 percent of the US level. Through 1973, Britain's GDP per capita grew at almost the same rate as in the United States so it remained at 71 percent and therefore did not achieve any catch-up to the United States over this period.⁵

Clearly, the major European economies took advantage of postwar opportunities to achieve this high level of success. Moreover, they achieved this success despite operating with institutional rigidities (which were in place well before 1973) that have been blamed for later economic weakness, so there is an important question of why these problems did not stop the rapid growth and convergence from taking place.

The convergence of GDP per capita from 1950 to 1973 was not driven by a faster rate of growth of labor input in Europe than in the United States. Table 2.1 shows hours worked per capita for France, West Germany, Italy, Britain, and the United States in the two endpoint years. The figures are indexed to the United States, which equals 100 in each year. In France and West Germany labor input per capita declined a little relative to the United States. In Italy and Britain it rose a little. But in no country was the overall GDP per capita growth differential explained by changes in labor input per capita. (That statement is not true for later time periods.) It follows that the convergence in GDP per capita between continental Europe and the United States over this period was driven by much faster labor productivity growth in Europe (except for Britain).

5. All data from University of Groningen and the Conference Board (2004). In the 19th century per capita income in Britain was higher than that in the United States, so growth in Britain had been slower for an extended period prior to World War II. By holding its own in the postwar period, Britain actually improved over its previous growth experience.

Table 2.1 Annual hours worked per person employed, relative to the United States, 1950 and 1973 (United States = 100)

	France	West Germany	Italy	Britain	United States
1950	106.5	112.0	87.3	105.1	100
1973	95.9	105.0	95.4	108.9	100

Source: University of Groningen and the Conference Board (2004).

Edward Denison (1967), who used real national income per employee as his productivity measure, carried out the classic study of productivity growth in postwar Europe and the reasons for the differences in growth rates between the US and European economies. However, his analysis covered the 1950 to 1962 period and is therefore considered “out-of-date” by many economists. Although we will review more recent analyses of the same issues shortly, we feel that Denison’s work is still worth a quick review. His work stands out because it provides detailed sources of growth and found ways to quantify the contributions during an earlier time period. But perhaps most importantly, it gets the basic story right.

Table 2.2 is drawn from Denison (1967) and shows the contributions to the growth of national income per employee from a variety of sources for France, West Germany, Italy, Britain, and the United States. The top line indicates the overall productivity growth rate and the subsequent lines show the contributions to that total. The sources of growth are broken into two subgroups, first those that affect total factor input and, second, those that contribute to growth in output per unit of input (now referred to as multifactor productivity, or MFP).⁶

Denison concludes that most of the increase in national income per employee within each country does not come from input growth—rather it comes from growth in output per unit of input. The differences in growth rates among the countries are not explained by differences in input growth rates either. According to Denison, Europe did not achieve a productivity growth advantage over this period by raising labor quality or adding more capital per worker than did the United States.

Turning next to the sources of increase in output per unit of input (MFP), Denison argues that the outward movement of the technology frontier allows all of the economies to grow, and he attributes this same source of growth to all of the economies. Increases in MFP from advances in the technology frontier account for three-quarters of a percentage point a year for all of the countries. Denison appropriately uses the term “advances in knowledge” rather than technological change to describe this source of growth. One reason the frontier of best practice moves out over

6. It has also been referred to as total factor productivity (TFP). Today, most use the term MFP as we do throughout the book.

Table 2.2 Sources of growth in real national income per person employed, 1950–62

Source of growth	France	West Germany	Italy	Britain	United States
National income per person employed	4.80	5.15	5.36	1.63	2.15
Total factor input	1.13	.72	1.07	.45	.79
Labor	.37	-.12	.54	.10	.22
Hours of work	-.02	-.27	.05	-.15	-.17
Age-sex composition	.10	.04	.09	-.04	-.10
Education	.29	.11	.40	.29	.49
Capital	.76	.93	.57	.37	.60
Dwellings	.02	.12	.05	.02	.21
International assets	.02	-.08	-.03	-.06	.04
Nonresidential structures and equipment	.53	.66	.45	.35	.29
Inventories	.19	.23	.10	.06	.06
Land	.00	-.09	-.04	-.02	-.03
Output per unit of input	3.67	4.43	4.29	1.18	1.36
Advances in knowledge	.76	.75	.76	.75	.75
Changes in the lag in the application of knowledge, general efficiency, and errors and omissions					
Reduction in age of capital	.00	.04	.00	.00	n.a.
Other	.74	.79	.88	.04	n.a.
Improved allocation of resources					
Contraction of agricultural inputs	.65	.76	1.04	.06	.25
Contraction of nonagricultural self-employment	.23	.14	.22	.04	.04
Reduction of international trade barriers	.07	.10	.16	.02	.00
Economies of scale					
Growth of national market measured in US prices	.44	.62	.55	.22	.30
Income elasticities	.49	.90	.60	.09	n.a.
Independent growth of local markets	.07	.07	.07	.05	.06
Irregularities in pressure of demand	-.01	n.a.	.01	-.09	-.04
Construction deflation procedure	.23	n.a.	n.a.	n.a.	n.a.
Balancing of the capital stock	n.a.	.26	n.a.	n.a.	n.a.

n.a. = not applicable

Source: Denison (1967, tables 21.1 to 21.19).

time is that new science or engineering-based production methods are introduced. But another important reason is that business innovations result in improved practices as well as new products and services.

Continental Europe experienced faster growth because it had further to catch up than the United States. Europe had the opportunity to grow

faster than the United States because it started out far behind, having been so adversely affected by the destruction of World War II.

One important way in which catch-up occurs is that the gap between average productivity and best-practice productivity is much greater for countries in early stages of development. The European economies increased their productivity levels by adopting technologies and business methods that were already in use in the United States. Denison (1967) discovers that this practice substantially contributed to growth differentials, adding about 0.8 percentage points a year to European growth compared to the United States (almost zero in Britain).⁷

Catch-up also occurs when workers move from agriculture into industry and commerce. Typically there is very low labor productivity in agriculture at early or intermediate stages of economic development. When combined with capital investments and the transfer of technology, workers coming from agriculture can be employed in much higher-productivity sectors of the economy. Workers shifting from other low-productivity self-employment can similarly work in high-productivity sectors. The European countries, with the exception of Britain, all achieved substantial growth from these sources—close to or above one percentage point a year. In comparison, the United States grew only about a quarter of a percent a year from this source.

According to Denison (1967), fast-developing economies also have an advantage from economies of scale. He breaks this into two parts. The first is the conventional notion that as economies develop they can expand the scale of production of existing goods and services. Larger steel mills or electricity-generating plants are more productive than smaller ones (this statement would not hold in the same way today). In addition, Denison notes a virtuous circle of economic growth. As income grows rapidly, consumption also grows rapidly as people purchase more expensive, higher-value-added products and services. In the past, very few consumers purchased these niche items so they were produced at small scale and low productivity. However, as these products and services move into the mainstream, they can be produced at larger scale, often using technologies already widely used in the United States. Rapidly rising incomes and expenditures provided an opportunity to take advantage of economies of scale that were already available technologically but could not be justified when demand and incomes were low. This second source of productivity growth is measured in a way that takes the United States as a baseline. By definition, then, the United States gets a zero relative contribution

7. It is highly plausible that the European economies were able to apply existing US technologies and business methods during this period—indeed a whole industry of business and technology consulting developed to effect such a transfer. Note that Denison uses “errors and omissions” in his accounting to describe differences in productivity growth rates that could not be explained by specific measurable sources.

from this source.⁸ Thus, this form of economies of scale is an important partial explanation of why Europe grew faster than the United States in 1950–62. Overall economies of scale add nearly a percentage point to growth in France over the period, well over a percentage point in Germany and Italy, and about 0.3 percentage point a year in Britain and the United States.⁹

Alternative approaches to growth analysis would likely yield somewhat different findings from those in Denison's (1967) framework. For example, Dale Jorgenson's analysis (1995) has given a larger weight to capital as a source of growth than Denison. The level of capital intensity in Europe in 1950 was very low, and there was rapid capital accumulation over the next 23 years. Denison allows for this, but may not give enough credit to this effect. The faster productivity growth in Europe was likely driven more by the faster growth in capital input than Denison allows for.¹⁰ This could be construed as a form of catch-up as capital intensity equalizes across countries and technology is embodied in new capital goods.

Despite some possible adjustments to update Denison's analysis, the overall conclusions from his work still make good sense. Following World War II, both Europe and the United States experienced strong productivity growth. However, Europe's growth—with the exception of Britain—far outpaced that of the United States. The reasons for this growth differ-

8. Denison tries to explain the differences in growth rates between the United States and each European economy. The growth within any given European economy is calculated using a domestic price index that uses relative prices that are specific to the given country. This estimated growth rate is faster than the growth rate that would be calculated using US relative prices. The difference between the two growth rates is then attributed to the second economies-of-scale term and interpreted by Denison in the way described above. The overall growth rate of an economy is the weighted average of the growth rates of the different goods and services produced, with relative prices as the weights (plus some additional terms). Many of the items that grew rapidly in postwar Europe had lower relative prices in the United States and, hence, smaller weights when growth is calculated with US relative prices.

9. Other sources of growth differences are less significant. Productivity growth varies with the business cycle and Denison adjusts for this, although it makes only a trivial difference to the outcome. In France, the method used to calculate real construction gives a boost to measured growth in its economy. Denison also estimated that the recovery from wartime damage in Germany boosted growth in that economy after 1950. He describes that as "balancing the capital stock."

10. Denison uses national income as his output measure, a concept that is net of depreciation. In estimating the contribution of capital to the growth of output, he uses the share of capital income in national income. The use of income shares is standard procedure in growth accounting, but Denison is unusual in using the capital income share net of depreciation. Using a production-function framework suggests the contribution of capital should be based on the gross income share, which gives a larger weight to capital. It is worth noting, however, that when output measures include depreciation (as is the case, for example, for GDP or business-sector output) the growth rate will overstate the growth of economic well-being if the share of depreciation in output is rising. This point motivates Denison's use of national income and the net capital income share.

ential seem largely driven by various aspects of economic catch-up, which include the movement of workers off the farms, the rebuilding of production damaged or destroyed in the war, the expansion of the capital-intensive, high-productivity sector of the economy, the ability to exploit economies of scale, and the movement toward best-practice technologies and production methods.

This process seems to have continued well after the end point of the Denison study. The frontier of best-practice productivity was rising rapidly in the United States until 1973, sustaining the potential growth that Europe could achieve. GDP per hour worked—an alternative measure of broad labor productivity—showed that productivity was growing at 3.0 percent a year in the United States. But Europe still had room for additional catch-up through 1973 because the level of productivity was still substantially higher in the United States. In 1973, France was at 80 percent of the US level, West Germany 75 percent, Italy 72 percent, and Britain 65 percent.¹¹ Hence, the productivity growth potential remained greater in Europe than in the United States in 1973 and beyond.¹²

The European System's Advantages for Postwar Catch-Up

The rapid convergence of France, West Germany, and Italy toward the US level of productivity through 1973 could be considered unsurprising since economic growth theory predicts it. Common sense also suggests that transferring more productive technologies and business processes is easier than pushing out the frontier.

But convergence is not a foregone conclusion. Despite potential, many countries failed to converge toward the productivity frontier, and there was a widening gap between rich and poor. Britain is one prime example though there are many others. Therefore, the economic conditions must have been relatively favorable for convergence in France, West Germany, Italy, and many other European economies. Drawing on Denison's work (1967) and more recent studies, notably Temin's (2002) review and additional analysis, we conclude the European economy had the following advantages that contributed to its rapid postwar convergence:

- Europe was an industrial and commercial powerhouse before World War II. Therefore, its economic infrastructure already existed, and

11. The University of Groningen and the Conference Board (2004), based on 1990 purchasing power parity (PPP) exchange rates.

12. This description is too US-centric because it implies advances of the frontier were always made in the United States and then transferred to Europe. This is not the case. Many European innovations—such as specialized machine tools—were developed and then used in the United States. Furthermore, Japanese industries, such as steel, auto, and machine tools, overtook US productivity levels in the 1980s.

some of the technological knowledge, infrastructure, and managerial and worker skills were still available in its aftermath. Although the United States had become overall the most productive economy around the turn of the 20th century, Europe's economy was not far behind and, in fact, had many areas of strength and superiority. For example, France was a leader in commercial aviation before the war, and Germany was building its industrial strength and infrastructure. In contrast, the US economy in the 1930s was still struggling in the aftermath of the Great Depression.

- The continental European economies boosted productivity by shifting workers from agriculture into industry and commerce. Denison (1967) makes the point initially, and Temin (2002) stresses its importance, noting that unlike the United States and Britain, continental Europe still had a lot of workers in agriculture in 1950.¹³
- As Olson (1984) has pointed out, the war disrupted the existing network of anticompetitive coalitions and monopolies in Europe. In its aftermath, these economies were able to develop new industries and allow old industries to die.
- Social and economic policies focused primarily on recovery, catch-up, and growth.¹⁴ Some have questioned Olson's thesis about the destruction of the prewar coalitions, arguing that many remained intact—the craft unions in Germany, for example. But even to the extent that this criticism is warranted, the imperative need for economic recovery and growth trumped the tendency of coalition groups to fight for the largest share of the pie, especially since the size of the pie was growing rapidly. Eichengreen (1995), for example, argues that Germany and other European economies were able to maintain a pact of cooperation with their workers that kept investment and exports profitable while sustaining rapid growth.¹⁵ A range of national and international institutions supported these pacts.

13. In Temin's view, the availability of excess labor in agriculture "explains" how continental Europe grew faster than the United States or Britain after World War II. This idea should not be overstressed, however, because the bulk of economic catch-up in Europe was occurring in the nonfarm sector. We discuss Britain in more depth in chapter 4. The real puzzle is that Britain's productivity in the nonfarm economy was about half of the US level in 1950 and closed this gap only very slowly indeed over the next 50 years.

14. Crafts and Toniolo (1996) attribute much of the rapid growth of the postwar period to the slowdown that preceded it and the disruption of the war itself.

15. Eichengreen emphasizes that the pact with workers kept wage growth low but that argument seems unconvincing. Wage data are discussed again later in this chapter, but it is notable that manufacturing real-wage growth in Germany in 1950–73 was around 7 percent a year, and both France and Italy also had rapid real-wage growth (see figure 2.7). It is fairly easy to retain workers with a social pact when productivity and wages are growing so fast. As we argue later, the social pact unraveled when productivity growth slowed down in the 1970s.

- Taking the above point further, the economic coalitions that survived or developed in the postwar period may have contributed positively to rapid growth by providing job training for workers. For example, the German craft unions expanded their apprenticeship programs, which increased skill levels. To avoid labor-market failure, the European economies discouraged worker mobility and encouraged on-the-job training to retain workers.¹⁶
- Generous support for the unemployed and extensive job training programs ensured that displaced workers were able to survive economically and seek new positions.
- In response to the turbulence of the first half of the 20th century, households became risk averse, prompting them to save a large portion of their incomes (relative to the United States) and to place their savings in low-risk (and low-return) assets, notably in savings accounts at state-guaranteed banks. These banks then had a pool of low-cost funds, which they channeled into local business development. These funds helped rebuild and expand the commercial and industrial base of Europe's economy.
- Close ties between business and government facilitated the recovery and expansion of many key industries. France, in particular, used state subsidies, technology support, and favorable tax and regulatory conditions to encourage growth (see, for example, Zysman 1977).

Europe achieved a virtuous cycle for nearly 30 years after the war: It adopted global best practices, and enjoyed growing employment and rapidly rising real wages. Young people trained as apprentices readily found work in their chosen industries. There was investment in clearly needed sectors, and economic returns were adequate. The population was motivated to rebuild the economy and establish a peaceful and prosperous Europe.

Given their successful convergence, the social institutions and policies of continental Europe were well suited to postwar recovery and catch-up. However, the above list of European "advantages" for economic catch-up and postwar growth included warning signs of problems to come when conditions changed.

- Some economic coalitions reformed after the war, increasing rigidity in the economies.

16. In principle, this market failure applies only to "firm-specific" skills. Workers can pay firms to provide them with general training. However, in practice, this process is difficult to administer and enforce because high labor turnover discourages both firm-specific and more general training.

- Firms that had been committed to output and productivity increase became more focused on preserving employment as industries matured and output growth slowed.
- The apprenticeship programs faced trouble when new jobs were unavailable for their graduates. These programs created a rather rigid labor market.
- The closed capital market, which was based on close relations between banks and their borrowers, worked less efficiently as incumbent industries contracted and returns to investment declined.
- Innovative new technologies remained undeveloped by large companies with a large stake in existing technologies.
- Close relations between business and government led to overstuffed state-owned or state-supported monopolies or oligopolies.
- Generous unemployment benefits encouraged workers to remain jobless, particularly with the decreasing availability of attractive new jobs.
- Households became less risk averse and looked for higher-return assets outside the traditional banking systems.

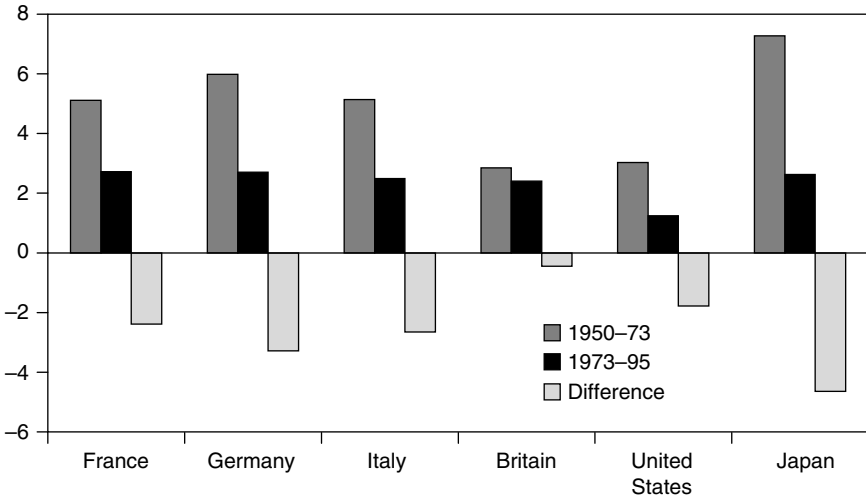
The potential for trouble existed, therefore, even during the postwar period of rapid growth and economic success. Once the series of structural shocks hit, the underlying problems or fault lines were revealed.

The 1973–95 Global Growth Slowdown

There was a sharp slowdown in US and European economic growth after 1973. The immediate and obvious cause was the sharp increase in oil prices imposed by OPEC, compounded by a rapid run-up in world commodity prices, especially food prices. These “supply shocks” induced a surge of inflation followed by high interest rates and a sharp decline in global growth. A temporary slowing of productivity growth is naturally associated with a recession and the slowing of output growth, so initially there was little concern about its decline. As time passed, however, it became obvious that the long-run trend of labor productivity growth had slowed sharply in all the major industrial economies. In chapter 3 we explore some of the possible reasons why the productivity growth slowdown occurred in the United States and see what implications it has for Europe. The initial hypothesis blaming energy prices was incorrect. These prices affected the business cycle but cannot explain the shift in the productivity trend. After all, energy prices fell again without any resurgence of productivity growth.

Figure 2.1 Productivity growth pre- and post-1973

percent growth in GDP per hour worked



Note: Annual average cumulative growth, GDP per hour, in 1990 Geary-Khamis Multilateral Index dollars.

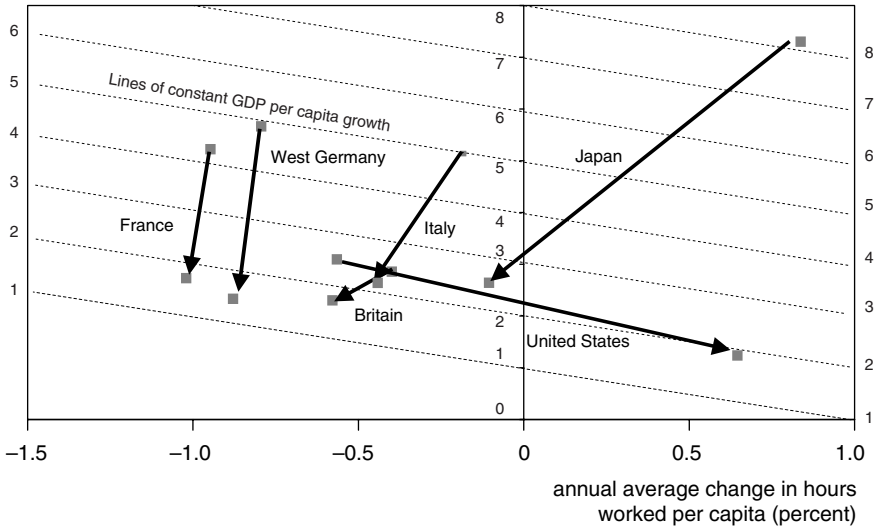
Source: University of Groningen and the Conference Board (2004).

The reason for the productivity growth slowdown in Europe is easier to understand if one builds on Denison's analysis (1967) of what caused faster growth prior to 1973. Since Europe was taking advantage of its opportunity for economic catch-up, it was inevitable that as its productivity level grew closer to that of the United States, its rate of increase would slow. In 1973, Europe was hit by a double blow. Its opportunity for catch-up was running out just as the pace of productivity increase on the frontier slowed sharply. (Britain was doing much less catching up and so it slowed much less.)

Figure 2.1 shows the sharp decline in productivity growth in the US and European economies as well as in Japan. The magnitude of the slowdown across the board was astounding. These wealthy countries experience a huge shift in economic fortunes and adjustment to the change was difficult in both the short term (with the surge in unemployment and inflation) and the long term. The slowdown in US productivity growth occurred rather abruptly. The growth rate dropped sharply after 1973 and stayed low until 1995. In Europe, there was also an abrupt drop in growth after 1973, but it was followed by further declines in the growth rate. However, the growth of European (and Japanese) labor productivity remained higher than in the United States *until* 1996. (Britain, which had been the productivity laggard of the group, at least kept pace with the rest of Europe and actually grew faster than the United States.)

Figure 2.2 Comparative effect of post-1973 slowdown on productivity growth and labor utilization

annual average change in GDP per hour worked (percent)



Note: 1950–73 as starting point; 1973–95 as endpoint.

Source: University of Groningen and the Conference Board (2004).

The faster productivity growth in Europe meant that catch-up continued after 1973—and even surpassed the United States. By the mid-1990s GDP per hour worked was actually higher in France and West Germany than in the United States¹⁷—in 1995, GDP per hour was 110 percent of the US level in France, 103 percent in Germany, and 106 percent in Italy. By contrast, productivity in Britain, at 86 percent, remained well below the US level.¹⁸

Figure 2.2 combines data on productivity growth (GDP per hour worked) and on labor utilization (hours worked per capita).¹⁹ It compares the 1950 to 1973 period with the 1973 to 1995 period. The starting point of each arrow reflects the average rates of growth or decline of productivity

17. One interpretation is that France and Germany had caught up with and even surpassed the United States in technology and/or business process design, but this interpretation is not likely. Productivity data based on GDP per hour are tricky to interpret, especially when low-skilled workers drop out of the labor force.

18. Data are from the University of Groningen and the Conference Board (2004).

19. Bart van Ark of the University Groningen, Robert McGuckin of the Conference Board, and Dean Parham of the Australian Productivity Commission have all used versions of this figure.

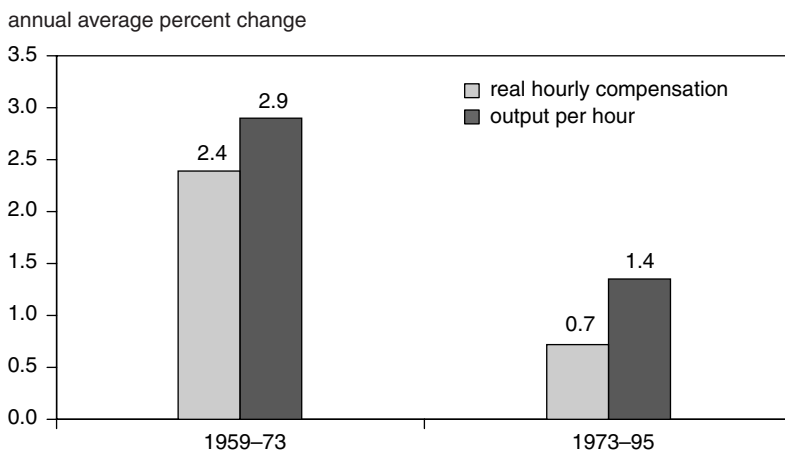
and labor utilization for the 1950–73 period. The endpoint of the arrow does the same for the 1973–95 period. The direction and length of each arrow in the figure illustrate how productivity growth and labor utilization shifted over the two periods. The fact that all the countries experienced slower productivity growth is reflected by all the downward-pointing arrows. The degree of the vertical declines corresponds to the magnitude of the slowdowns shown in figure 2.1.

Looking at the horizontal axis, the arrow for the United States slopes to the right. There was a modest decline in the number of hours worked per capita during 1950–73. By contrast, there was a substantial growth in hours per capita in 1973–95. This was associated with the entry of the baby boom generation into the workforce and also the increasing number of women in the labor force. In contrast, the number of male workers—particularly older men—in the workforce declined slowly over this period. The substantial shift in labor-input growth, comparing the two periods, meant that the growth rate of GDP per capita declined very little in the United States. The figure also shows lines of constant GDP per capita growth, and the US arrow starts just above the 2 percent line pre-1973 and moves just below 2 percent post-1973. Without attributing cause and effect, the United States maintained a fairly stable growth in overall pecuniary living standards over these two periods because falling productivity growth was largely offset by more hours worked.

The pattern for France, West Germany, and Italy is very different. Hours per capita had been declining prior to 1973, especially in France and West Germany, and that decline continued afterward. Combining the declines in productivity growth and labor input means that GDP per capita growth fell very sharply for the core European countries and Japan. GDP per capita growth in France and West Germany dropped to about the same level as the United States post-1973, after having grown much faster prior to that year. The European pattern also holds in Britain, although the changes in growth rates were much smaller. Japan continued to experience faster GDP per capita growth than the United States over the 1973 to 1995 period taken as a whole. However, the Japanese story is more complex than the figure illustrates, since there was strong growth in the 1980s and then virtual stagnation in the 1990s.

The declines in productivity growth meant that real wages that had risen rapidly for over 20 years now either grew very slowly or even declined for segments of the population. It resulted in a surge in inflation followed by a surge in unemployment—stagflation. The US and European macroeconomic literature of the 1970s and 1980s is dominated by the problems of high inflation and high unemployment. The economies adjusted to the slowdowns in different ways given the diverse institutions and policies that were in place in each country. A central element of that adjustment is the extent to which average real wages adjusted and how that affected the trade-off between inflation and unemployment.

Figure 2.3 US wage growth pre- and post-1973, 1959–95
(nonfarm business sector)



Source: Bureau of Labor Statistics (2004).

The Impact of Slower Productivity Growth: The US Lesson

When productivity growth slowed after 1973, real-wage growth in the United States also slowed (figure 2.3). In fact real-wage growth slowed even more than the overall decline in productivity growth because it was particularly concentrated in goods and services that workers buy. Indeed, productivity growth in both the service and construction sector of the US economy essentially collapsed after 1973. As a result, consumption-goods prices rose more than the overall price level, hurting real-wage rates.²⁰

The impact of the growth slowdown was exacerbated in the post-1973 period by the increases in commodity prices—particularly for food and energy. In the case of oil, a sharp rise in prices imposes a large consumer tax on consumers that shows up as higher profits for energy producers, including OPEC. Workers pay that tax in the reduction in their real consumption wages. Actual declines in real wages, not just slower growth, were evident in the food and energy shock period of the 1970s.²¹

20. See Lawrence and Slaughter (1993) and Bosworth and Perry (1994) for further discussion of this point.

21. There may be a cyclical pattern to real wages, but it is not large enough to significantly affect longer-term trends. According to Abraham and Haltiwanger (1995): “To sum up, correcting for all of the measurement problems, estimation problems, and composition problems does not lead to a finding of systematically procyclical or countercyclical real wages.” Abraham and Haltiwanger do note, however, that “the cyclical nature of real wages is not likely to be stable over time.”

Table 2.3 US unemployment and inflation, 1950–95

Year	Average unemployment ^a	Average core inflation ^b
1950–73	4.8	2.8
1974–85	7.5	7.5
1986–95	6.2	6.2

a. Straight average of annual data.

b. Average annual percent change.

Sources: Bureau of Labor Statistics, www.bls.gov/webapps/legacy/cpsatab9.htm; Bureau of Economic Analysis, chain price index for personal consumption expenditure, excluding food and energy, www.bea.gov/bea/dn/nipaweb/NIPATableIndex.htm.

Therefore, a key lesson from the US experience is that the slowdown in productivity growth forced a decline in the growth of real wages—in fact, there were periods where average real wages fell. Slow growth or declines in real wages are bad enough in themselves, but their impact on the economy can be magnified if they trigger declines in employment and increases in unemployment, which is what occurred in the United States for an extended period.

Consequence of the productivity growth slowdown on the unemployment-inflation trade-off.²² There were periods of recession and recovery after 1973, but the average levels of both inflation and unemployment were much higher than in 1950–73 (see table 2.3). We argue this was an adverse side effect of the productivity and real-wage slowdowns.²³

The mechanism follows: It is a robust result that there is substantial inertia in wage setting, where the rate of nominal wage increase in any given year is largely predetermined by the rates of increase in wages and

22. Econometricians such as Christopher Sims (1999) and James Stock (1998) question whether there is any systematic trade-off relation between inflation and unemployment. They note that in unrestricted regressions, the unemployment rate is a poor predictor of inflation. Many observers have pointed out that outside the United States (Europe specifically), the Phillips curve relationship looks even more unstable. While recognizing the basis for the Sims-Stock viewpoint, it is still helpful to look at both inflation and unemployment together. The fact that unemployment is an unreliable forecasting variable does not invalidate the concept of an unemployment-inflation trade-off. Both inflation and unemployment may be affected strongly by other factors—unemployment is certainly not the *only* factor affecting inflation. Nevertheless, Sims and Stock raise a legitimate question. The rise in unemployment after 1973 may have been affected by structural changes within the labor market, including the rising number of young workers.

23. The idea that the changes in the trend rate of productivity growth can have a major effect on inflation and unemployment has been proposed by Alan Blinder (2000), the Council of Economic Advisers (2000), and Laurence Ball and Robert Moffitt (2001).

prices in the prior couple of years. Since labor costs are such a large fraction of total costs, wage inflation—once it develops—feeds directly into price inflation. The wage-price spiral seems to exist even though it has proven hard to demonstrate the solid economic theory behind it. Therefore, any change in trend productivity growth will immediately affect the wage-price process. Wage inflation in a given period is largely predetermined and so a decrease in productivity growth will raise the rate of increase of unit labor costs. Some part of this may translate into lower profit margins, but some part will also yield higher-price inflation. Higher price inflation then pushes up wage increases in the next cycle.

The productivity deceleration triggered inflation and an upward wage-price spiral because nominal wage increases did not parallel the slowdown of productivity growth.

The rate of change of nominal wages is sticky, but not completely rigid. The rate of nominal wage increase eventually adjusts downward to parallel slower real wage growth. In the United States it appears the adjustment occurred by the 1980s. With the drop in oil prices in 1986, the inflation spiral was reversed, and both unemployment and inflation were at moderate levels during 1986 to 1995.

This idea that a slowdown in productivity growth worsens the inflation-unemployment trade-off is supported by the US experience after 1995. When US productivity growth accelerated after 1995, unemployment fell to 4 percent with only a small increase in inflation.

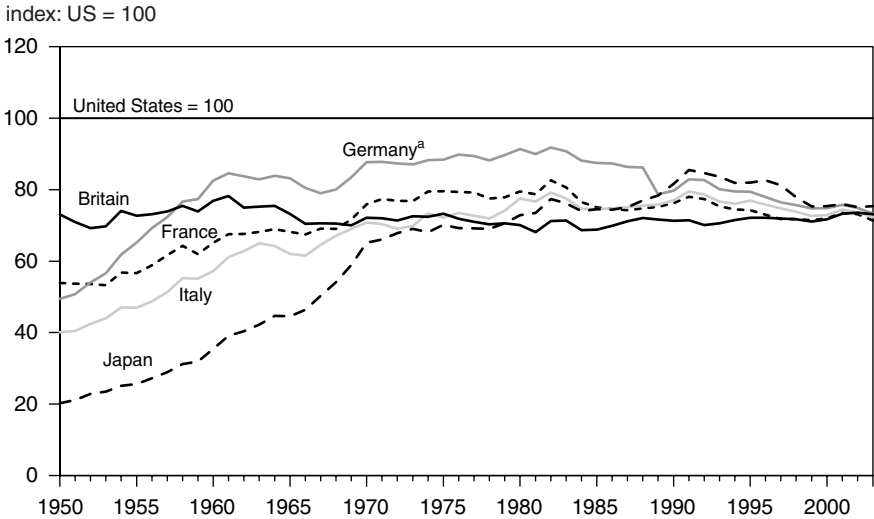
In summary, the productivity growth slowdown in the United States generated stagflation for many years. Full employment with low inflation was restored only at the cost of a significant decline in real wage growth and even some absolute declines in real wages.²⁴ In the United States the productivity slowdown did not result in a permanent upward ratchet in the unemployment rate.

The Impact of the Productivity Growth Slowdown on the European Economy

Europe faced a slowdown in productivity growth after 1973 that was equal to or greater than the US slowdown. Unsurprisingly, this slowdown also triggered stagflation. However, unlike the United States, Europe found it much more difficult to fully adjust to slower productivity growth. Instead, after 1973 the problem of “Eurosclerosis” emerged (Giersch 1985), meaning that Europe seemed incapable of growing fast enough to restore full employment. Figure 2.4 shows the evolution of

24. The gyrations in oil and food prices also contributed to the episodes of US stagflation in the 1970s and 1980s.

Figure 2.4 End of economic convergence in GDP per capita, select countries, 1950–2003



a. 1999 calculated using the Elzeko-Köves-Szule formula: 1950–88 = West Germany and 1989–2002 = reunified Germany.

Source: University of Groningen and the Conference Board (2004).

GDP per capita from 1950 to 2003 for the United States, France, Germany, Britain, Italy, and Japan. The economic convergence, which had been so pronounced in the 1950s and 1960s, continued into the 1970s for Europe and into the 1980s for Japan, but it occurred at a much slower rate than before. Moreover, the convergence process stopped and perceptible divergence began in the 1990s.

The Special Case of Germany

Germany deserves special note because reunification occurred after 1990. West Germany had reached a level of GDP per capita that was approaching the US level by 1970 (it was 88 percent of the US level that year). After that, convergence largely ceased and a mild divergence in per capita income levels emerged in the 1980s. Reunification naturally caused a drop in average per capita income level for Germany as a whole—about 10 percentage points. This pushed the combined German economy in 1989 down to 79 percent of the US level. Following reunification there was a challenge to assimilate the two parts of the country, and an opportunity for faster overall growth as capital and skills were upgraded in the East.

Significant economic resources were transferred from West to East Germany throughout the 1990s (more than €500 billion so far²⁵). These resources helped East Germany catch up by improving infrastructure, providing worker training, and offering incentives for private investment. However, income support for unemployed workers also made up a significant portion of the payments to the east. All told, these resources equaled about 4 percent of West German GDP per year—a pace that continues at the same level through to the present time.

In some respects the integration of the East German economy has been a success. Labor productivity in the East has risen from 44 percent of the West German level in 1991 to 73 percent in 2000. GDP per capita has risen from 42 percent of the West German level in 1991 to 65 percent by 2000 (Burda and Hunt 2001, table 3). But the cup is simultaneously half empty and half full. Convergence between East and West Germany occurred rapidly in the early 1990s, fueling rapid growth in GDP per capita in Germany as a whole. But convergence stalled in the second half of the decade. Moreover, the burden of absorbing the East may have adversely affected the *relative* performance of the overall German economy. GDP per capita in all of Germany after 1993 grew more slowly than in the United States, France, and even much slower than Britain from 1993 to 2002.

Germany should have grown at a faster pace than other advanced economies in the 1990s because of the opportunity for the East to catch-up. One of Germany's main economic problems is insufficient job creation, as evidenced by its high unemployment. The unemployment rate in East Germany rose from 10.3 percent in 1991 to 19.0 percent in 1999 and in West Germany from 6.3 percent to 9.9 percent over the same period.²⁶

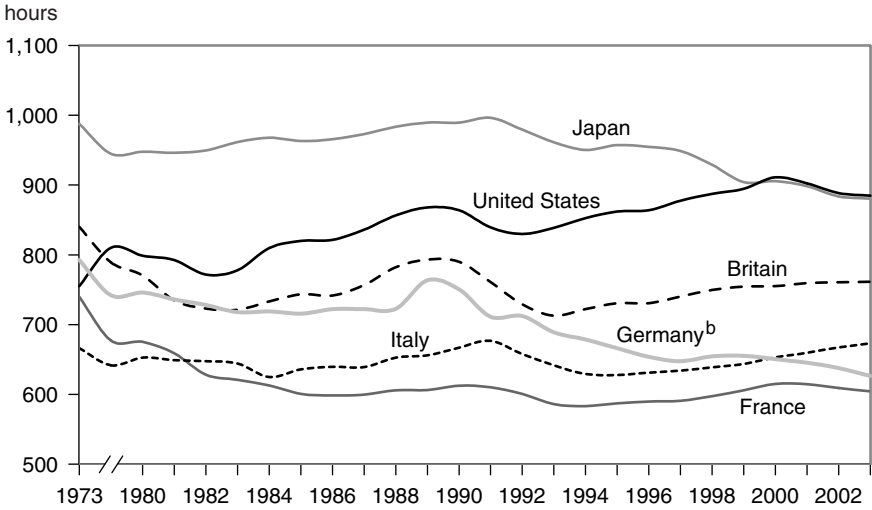
Job Creation

Even though productivity growth in Europe slowed after 1973, it continued to outpace the United States until 1995. The end of the convergence in GDP per capita came from a relative decline in hours worked per capita. Figure 2.5 shows the evolution of hours worked per capita over the

25. In January 2004 the German Bundesrat endorsed the so-called Solidarpakt II as part of the German government's *Aufbau Ost* (Eastern Construction) program. An additional €156.5 billion will be available for reconstruction from 2005–19. See German Government, Solidarpakt wird nach 2004 weitergeführt, press release, January 21, 2004, www.bundesregierung.de/Themen-A-Z/Aufbau-Ost/Nachrichten-611.46679/artikel/Solidarpakt-wird-nach-2004-wei.htm.

26. Germany uses a more comprehensive definition of unemployment than the United States. Adjusted to the US concept of unemployment, the overall rate for all of Germany in 1999 was 8.65 percent, according to the Bureau of Labor Statistics, whereas the German data (*Arbeitsamt*) for all of Germany was 11.7 percent. The OECD Standard Labor Force Indicators 1999 showed unemployment in all of Germany at 8.4 percent.

Figure 2.5 Total hours worked per capita,^a select countries, 1973–2003



a. Employment times average annual hours worked per worker divided by population.

b. 1973–88 = West Germany and 1989–2003 = reunified Germany.

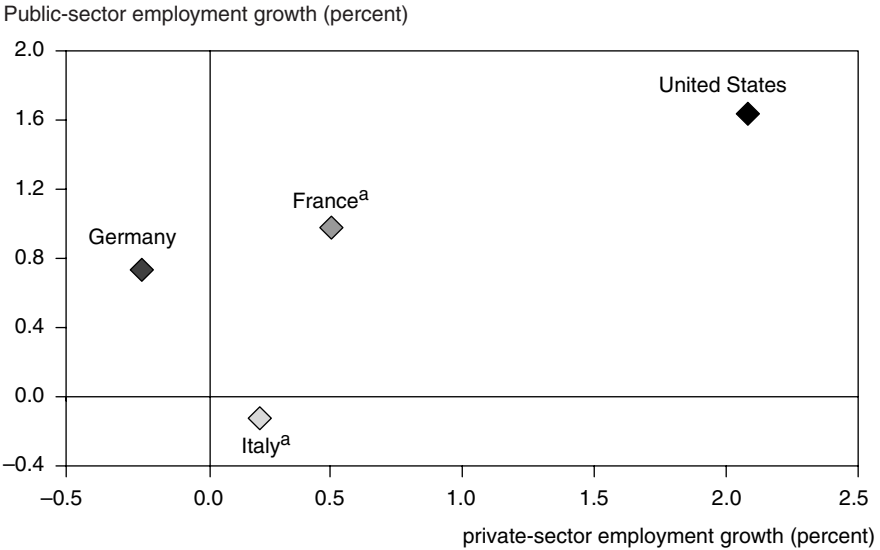
Source: University of Groningen and the Conference Board (2004).

period. The figure shows that Germany, France, Britain, and the United States all had similar *levels* of labor input per capita in 1973, but there was a substantial decline over the next 25 years in the European economies while the United States had an increase. The sharp drop between 1973 and 1979 occurred as part of the cyclical slump and partial recovery of the mid-1970s.²⁷ For Germany the data are for West Germany until 1988 and for all of Germany thereafter. France has the lowest level of labor input per capita among this group of countries, but the trend shifted after 1993 when a gradual increase in hours worked took place. Britain experienced a less dramatic overall decline and even had a gradual increase in labor input in the 1990s. Italian employment data are somewhat unreliable because of unreported employment, but the official data show a very low level of labor input in 1973, though not much of a decline in trend after that. Japan is included only for comparison purposes. It has traditionally worked very long hours and had a higher labor input per capita than the United States. In the 1990s, however, Japan’s economic problems are associated with a drop in labor input, to the point where the level was about equal to the US level in 2000.

Figure 2.6 illustrates the average employment growth of four economies in the government (public) sector and the business (private) sector during

27. Note that the data in figure 2.5 jump from 1973 to 1979 but are annual thereafter.

Figure 2.6 Public- and private-sector average employment growth, select countries, 1992–2001



a. Data for Italy and France = 1992–99.

Note: Public sector defined as ISIC categories 75 (public administration and defense), 80 (education), and 85 (health and social work). Private sector defined as the remaining economies.

Source: OECD STAN Database (2003j).

1992 to 2001, as compiled by the OECD. The figure shows that France, Germany, and Italy all experienced either very slow growth or a decline in private-sector employment. France and Germany enjoyed their most robust employment growth in the public sector. Although public-sector employment is important, it is ultimately financed by economic activity generated in the private sector. Therefore, building a base of productive jobs in the private sector is an essential part of any successful economic growth strategy. In Europe, *the large employment losses of the 1970s and early 1980s have never been regained, particularly those in the private sector.*

As employment rates declined in Europe, unemployment rates naturally rose. Whereas unemployment rates of 2 percent or below were common in the 1960s in Europe, rates of 8 to 10 percent became the norm by the 1990s. The inflationary surges of the 1970s were overcome in Europe, just as in the United States, but the unemployment rates stayed high instead of coming back down. The traditional trade-off between unemployment and inflation seemed to shift permanently. As a statistical relationship, this (Phillips curve) trade-off for European economies became unstable to the point of nonexistence.

Reasons for the Failure to Adjust to the Slowdown

There are four possible reasons why the employment losses of the 1970s and 1980s were never regained in Europe, most notably in France and Germany. First, real wages are institutionally set and their growth rate kept high, which forces an adjustment of employment. Second, high levels of transfer payments (unemployment insurance, welfare, early retirement provisions, disability payments, etc.) discouraged labor supply and encouraged workers to remain unemployed or out of the labor force. The fact that such benefits can be collected for long periods, even indefinitely, is thought to be as important as the generosity of the payments. Third, restrictions in product markets discouraged the development of new lines of business and thus competition. Fourth, Europeans voluntarily decided they were willing to accept lower incomes in exchange for fewer hours of work.²⁸

The first three reasons why employment losses have not been regained are clearly significant since they determine the incentive to work and/or access to employment in each country. The three are also interrelated: Generous transfer payments to the unemployed will discourage the supply of labor. The taxes that are levied to pay for these transfers will lower the after-tax wage of workers, which will also discourage the supply of labor (for a given level of transfer benefits). If legal or institutionally set wages are too high (above a market equilibrium), this will discourage the demand for labor. If product-market restrictions are stifling change in the economy, this will lower productivity and the demand for labor, reducing employment directly if wages are fixed. If wages are flexible, the product-market restrictions will keep wage increases down and this will discourage the supply of labor (for a given level of transfer benefit levels).

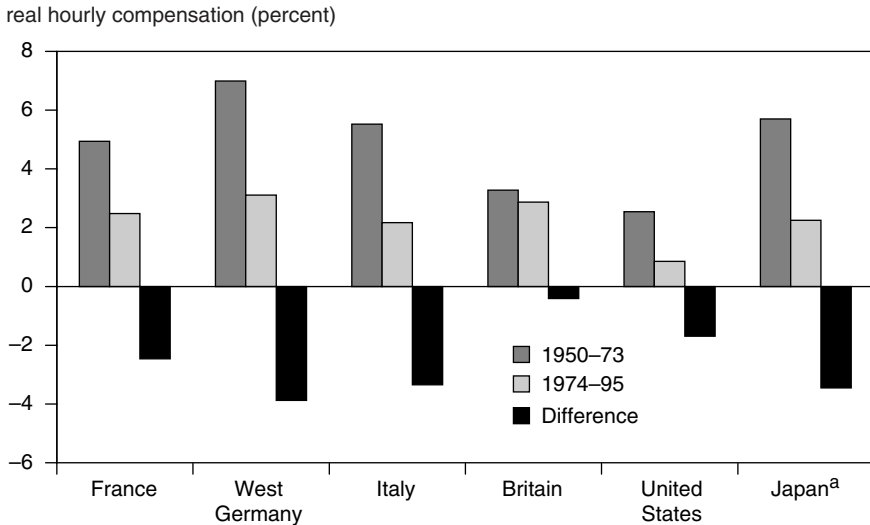
The fourth reason for continued employment losses—the preference for leisure—is hard to resolve, and we postpone a discussion of it until later in the chapter. Instead we pursue the other three hypotheses, which gave rise in the 1980s to the “wage-gap” model of high European unemployment or nonemployment.

The Wage-Gap Hypothesis

The 1980s literature on Eurosclerosis focused on the idea that rising real wages and slowing productivity had created a real wage gap in Europe,

28. In this discussion, we have moved back and forth between total labor input (number of jobs times hours worked per employee) and total employment. The two diverged significantly in Europe because of a substantial decline in the number of hours worked per employee. Both measures of labor input are important for different purposes. Later in this chapter, there will be a discussion of the issues that arise when labor input is reduced by decreasing hours of work rather than cutting jobs.

Figure 2.7 Real-wage compensation pre- and post-1973, select countries



a. 1955-73.

Source: Bureau of Labor Statistics (2002, table 13).

pushing the level of wages above the level of productivity and creating structural unemployment.

Figure 2.7 shows the slowdown in real-wage growth in the sample countries after 1973. When compared to the data for the same countries in figure 2.1, it is apparent that *the slowdown in productivity growth was matched by an equal slowdown in real-wage growth*. So it looks, on the face of it, as if the wage-gap hypothesis is incorrect. Europe's institutional rigidities did not prevent real wage growth from adjusting downward by about the same amount as (or more than) the decline in labor productivity growth.²⁹

As Schultze (1987) has pointed out, however, this comparison is misleading to the point where it reveals little. There is a two-way interaction between productivity and real wages.

- Innovations that improve the technologies and business processes used in an economy³⁰ can also increase worker productivity and the

29. The wage rates shown are hourly earnings for workers in the manufacturing sector only since these can be compared across countries more reliably than broader wage measures. The price deflators used to construct the real wages are consumer price indexes, which have idiosyncrasies over time and across country. Nevertheless, the broad conclusion should be robust.

30. Innovation and business process improvement generally also involve capital investment.

demand for labor. This will increase real wages, employment, or some combination of the two. During the 1950s and 1960s both Europe and the United States benefited from this favorable dynamic.

- Real wages may be increased at a faster rate than can be accommodated by the speed of innovation and business process improvement as a result of policy interventions or because of institutional forces. In this case, companies will reduce employment causing a rise in unemployment and a reduction in hours worked relative to the size of the population.³¹
- As a result of the response of employers to rising real wages, it is likely that average labor productivity will rise at about the same pace as the rate of real wage increase, even when wages are elevated by institutional forces. Employers will adjust their employment so that productivity stays in line with real wages.³²
- In an effort to preserve jobs, many European economies enacted layoff restrictions or penalties. This may slow job loss, but it will not halt it nor will it encourage new job creation.
- Policies and institutions can keep wage rates above the levels consistent with full employment in two ways. They can implement explicit wage-setting processes, such as high legal-wage minimums or union-set wages. Alternatively, generous income support can discourage the nonemployed from accepting low-wage jobs. Both of these forces can be at work simultaneously.

So the key question becomes whether the growth rate of real wages in Europe slowed *by enough to preserve full employment*. Unquestionably, it did not. Labor productivity in France and Germany in the 1980s and 1990s became too high relative to the level that would exist in a full-employment equilibrium. The employment growth rate exceeded productivity growth—the rate justified by the pace of innovation and capital accumulation.

How Productivity Adjusts to Higher Real Wages

The preceding discussion is based on the idea that if wages rise because of an institutional push or a decline in labor supply, then labor productivity will also be pushed up. How does this happen in practice? Standard

31. In practice, excess real-wage growth may not cause an absolute decline in employment, rather it may result in a slowing of employment growth relative to labor growth.

32. Firms will hire to the point where the marginal product of labor equals the real wage. In the simple case of a Cobb-Douglas production function, average and marginal labor productivity are proportional and will grow together.

Box 2.1 The timing of European welfare states

We argue throughout this book that social welfare and labor-market institutions can significantly affect national employment and productivity levels. Indeed, these institutions and policies are partly responsible for the poor employment and economic performance in the large continental European countries in recent years. Yet these same countries experienced extraordinarily strong economic performance in the period leading up to 1973. Our theory so far has been that as long as rapid catch-up was fueling economic and wage growth, the social policies were not a major constraint. They only became a problem after growth slowed in the 1970s. There is another aspect to this issue, however, which is the question of when the European welfare state was actually created. If Europe's welfare state is of more recent origin—implemented as a response to the economic and social effects of the first oil price shock in the years after 1973—the perspective changes.

Serious data problems immediately arise when an attempt is made to compare the level of and track the changes in social institutions among countries and through time dimensions since 1945. Valid cross-country comparisons of highly complex institutions are notoriously difficult and very few analyses have time-series dating back to 1945. Nonetheless, data for several important social institutions analyzed elsewhere in this book exist, and are summarized in the table below.

Social welfare and labor-market institutions, 1960–2000

	France	Germany	Italy	Sweden	United States
Government social expenditure (percent of GDP)					
1980	21.1	20.3	18.4	29.0	13.1
1998	28.8	26.0	25.1	31.0	14.6
Employment benefit replacement ratios (refers to first year of an unemployment spell averaged over three family types)					
1960–64	0.48	0.43	0.09	0.11	0.22
1973–79	0.56	0.39	0.04	0.57	0.28
1999	0.59	0.37	0.26 ^b	0.74	0.29
Employment benefit duration (index 0–1, as described in source)					
1960–64	0.28	0.57	0.00	0.00	0.12
1973–79	0.19	0.61	0.00	0.04	0.19
1999	0.47	0.75	0.013 ^b	0.02	0.22
Employment protection (index 0–2, as described in source)					
1960–64	0.37	0.45	1.92	0.00	0.10
1973–79	1.21	1.65	2.00	1.46	0.10
1998	1.40	1.30	1.50	1.10	0.10
Total taxes on labor (payroll tax, plus income tax plus consumption tax rate, percent)					
1960–64	55	43	57	41	34
1973–79	60	48	54	68	42
1996–2000	68	50	64	77	45
Enrollment in disability programs (20–64 years of age, stock per 1,000 population)					
1980	39.7	38.0	126.9	61.6	31.2
1999	46.8	42.4	54.9	82.1	46.8

(box continues on next page)

Box 2.1 The timing of European welfare states *(continued)*

Average retirement age (years, dynamic estimates)

Men					
1960–65	63.9 ^a	65.0 ^e	62.8 ^e	67.7 ^d	67.5
1973–78	61.8	61.7	62.5	64.2	64.2
1994–99	59.3	60.5 ^c	59.3	63.3	65.1
Women					
1960–65	64.6 ^a	61.9 ^e	58.5 ^e	63.3 ^d	66.5
1973–78	63.2	60.4	63.8	64.0	65.3
1994–99	59.8	60.8 ^c	58.4	61.8	64.2

a. 1962–67.

b. 1988–95.

c. 1993–98.

d. Static estimate.

e. Static estimate 1965–70.

Sources: Government social expenditure: OECD Social Expenditure database tracks government social expenditures in detail from 1980 to 1998; employment benefit replacement ratios: Nickell, Nunziata, and Ochel (2002) and Nickell (2003) track this variable from 1960 to 1999; employment benefit durations: Nickell, Nunziata, and Ochel (2002) and Nickell (2003) track this variable from 1960 to 1999; employment protection legislation; Nickell, Nunziata, and Ochel (2002) and Nickell (2003) track this variable using data from Blanchard and Wolfers (2000) from 1960 to 1998; total taxes on labor: Nickell, Nunziata, and Ochel (2002) and Nickell (2003) track this variable from 1960 to 2000; enrollment in disability programs: OECD (2002c) tracks this variable from 1980 to 1999; average retirement age: Scherer (2001) tracks this variable from 1960 to 1999.

The three main continental European economies of France, Germany, and Italy are included in the table. Sweden and the United States are also included to represent “two extremes” of a welfare state.

It is evident that social welfare payments were in place in France and Germany prior to 1973, although the programs became more generous over time. Italy had very limited unemployment benefits in the 1960s and 1970s, although this was then somewhat mitigated by the so-called “social shock absorbers.”¹ Somewhat the reverse holds for employment protection provisions. Italy had very restrictive legislation throughout the covered time period, while France and Germany introduced significantly tighter regulation after 1973.

We find that there were already fairly generous welfare provisions in Europe prior to 1973, but these general provisions did not affect productivity growth until the years following a slowdown. Unemployment benefits in European countries did exist prior to 1973 but became more generous, particularly in Italy, over time. Labor protections/restrictions tightened significantly after 1973.

1. The most commonly used “social shock absorber” (*ammortizzatori sociali*) instrument is the Wages Guarantee Funds. Two exist: the Ordinary Fund, which was introduced in 1945, is used during temporary cyclical downturns; the Extraordinary Fund, which was created in 1968, is provided for particular firms or sectors undertaking restructuring. Both funds, on a case-by-case basis, pay a benefit to workers equal to 80 percent of the normal wage for a maximum of three consecutive months.

economics illustrates how an economy's output depends on capital input, labor input, and technology (the concept of the aggregate production function). This assumes companies choose to produce a given level of output using either a large labor force and a low level of capital or vice versa (or anywhere in between). Labor and capital can be substituted for each other and companies decide the trade-off in order to minimize production costs. This decision is often determined by the relative price of labor and capital. Holding technology constant (with a given production function), companies will reduce their labor and increase capital as the real wage increases relative to the cost of capital. This framework predicts that if real wages are pushed up for institutional reasons, this will increase average labor productivity through capital-labor substitution. Basically, higher wages lead to increased automation, which raises labor productivity at the expense of employment.

Capital-labor substitution seems to have occurred in Europe, where the ratio of capital to hours worked has been pushed up (O'Mahony and de Boer 2002). The capital market structure in Europe, particularly in Germany,³³ may have encouraged this substitution. We noted earlier that high levels of household savings were a positive contributor to Europe's successful postwar growth. Banks channeled these funds into low-cost loans to the business sector, which worked well as long as opportunity existed for output expansion. But the impact of that same capital market structure is less favorable for the economy when companies use low-cost capital to reduce their employment of artificially expensive labor.

There are several other ways in which wages can affect employment outcomes and influence productivity. For instance, there are a significant number of US jobs that are less common or even nonexistent in Europe. The retail sector in the United States, for example, employs far more workers than it does in Europe, relative to population or even GDP. The availability of low-wage labor in the United States makes it economic to keep stores open long hours and to provide additional customer service. In the United States, 8 percent of retail employees earn wage rates below the French minimum wage (McKinsey Global Institute 2002b). As wages rise, these low-productivity jobs disappear because employers no longer earn a profit (retailers that provide extra services would have to recover the costs through higher prices). After eliminating the low-productivity activities from the economy, the average productivity of the remaining em-

33. Broadbent, Schumacher, and Schels (2004) point out how the German banking sector, dominated by state-owned institutions (Sparkassen and Landesbanken), often has not had strictly commercial lending priorities. Aimed at encouraging investment in their local areas, and with close, if informal, relationships with local politicians serving on their boards, such German financial institutions issued very low cost state-guaranteed debt to companies, possibly aggravating the economy-level capital-labor substitution. As demanded by the European Commission, government guarantees of the debt from such financial institutions in Germany must end in 2005.

ployed workers is then higher. This scenario is familiar enough as part of the normal process of economic development, but the troubling issue for Europe is that wages have risen enough to eliminate classes of employment even as large numbers of workers remain unemployed.

There are also ways of varying the capital labor ratio apart from differences in the degree of automation. The hours that retail stores or offices operate or the number of shifts in a manufacturing plant determines the capital utilization of that facility. If wage rates or shift premiums or labor regulations make it uneconomic or impossible to increase the hours of use of a capital facility, then that will effectively increase the ratio of the capital stock to labor hours. In the case of retailing, concentrating the shopping hours to narrow periods of the day or the week increases measured productivity—salespeople spend less time with no customers to wait on. This productivity increase occurs at the expense of customer convenience, since people cannot choose to shop during evenings and weekends. In the case of a manufacturing facility, the impact of the number of shifts on labor productivity will be small, although the number of hours of operation of plants will increase the amount of capital needed to produce a given level of output (measured MFP will be reduced).

Finally, and perhaps most importantly, high-wage minimums or high transfer payments will reduce the number of low-skilled people in the workforce. If we think of productivity as a property of individuals rather than of jobs, then eliminating all the low-productivity workers from employment will raise the average productivity of those remaining.

For the economy as a whole, therefore, there is a clear link between real wage increases, employment reductions, and productivity increases, when wages are pushed up.

Cyclical and Structural Sources of Low Employment

There is a long-standing debate in economics about whether high unemployment should be seen as a result of structural problems in the labor market or as a result of weak aggregate demand. The “classical” model asserts that unemployment results from “excessive” wages that price workers out of jobs, just as a company that sets too high prices for its product will be priced out of its market. By contrast, we, like most modern macroeconomists, take the view that cyclical episodes of high unemployment are associated with swings in the overall demand for goods and services in the economy. Following a triggering event, demand falls as cautious consumers cut back on their spending and businesses cut back on investment. Companies lay off workers even though real wage rates have not increased significantly. There is a negative cycle that results in a downturn, or, in the extreme case, a depression. Similarly, cyclical recoveries generate increases in employment even though wage rates have not

fallen. Demand management policies—notably monetary and fiscal—are needed to help the economy recover from a period of cyclical downturn.

The views expressed in this chapter about high unemployment and low employment levels in Europe are drawn from the classical tradition. The insufficient slowdown of real wage growth following the decline in productivity growth priced workers out of jobs (or high transfer payments have discouraged them from accepting jobs at low wages—a variant on the classical theme). How can this apparent inconsistency be resolved?

The answer depends on the time period involved. Employment fluctuates over the business cycle as a result of changes in aggregate demand. But in Europe these fluctuations have centered around a persistent trend of higher unemployment and fewer hours worked. Therefore, we focus on this persistent behavior in this analysis. The rise in structural unemployment is closely related to wages that are too high and work incentives that are too weak.

That is an oversimplification, however. There are important links between structural and cyclical unemployment. The rise in cyclical unemployment in the 1970s and 1980s, caused by insufficient aggregate demand, played a crucial role in initiating Europe's chronic high unemployment. As noted earlier, there may be a ratchet effect if workers who lose jobs in a cyclical downturn remain unemployed or leave the labor force even after the cyclical downturn is over. These unemployed workers become "outsiders" with eroding job skills who live on unemployment benefits. Hence, the existence of high unemployment no longer has any restraining effect on wage increases.

In this view, macroeconomic policymakers in Europe may bear some blame for Eurosclerosis. These policymakers could also help solve the problem by using expansionary policies, such as lower interest rates.

All the developed economies raised interest rates during the massive surges of inflation in the 1970s and early 1980s, so it is hard to blame European central banks or fiscal authorities for the early problems of stagflation. Afterward, however, an exaggerated fear of inflation, particularly by the Bundesbank, prevented more expansionary policies from being adopted once the inflation scourge was broken. Better macropolicy would have eased Europe's unemployment problems in the 1980s and might have left the region better off today.

That said, it is hard to make the case that macroeconomic policy alone could resolve the European employment problem. Such policies are not the only or even the most important reason for the persistence of low and declining employment levels in Europe over a 30-year period. Fluctuations in aggregate demand are the driving force behind short-term economic changes in the economy, but not of longer-term trends. In fact, individual economies made efforts to follow more expansionary policies, but their efforts were thwarted by rising inflation—a sign of problems on the supply side.

Regardless of the way in which the problem of low employment developed, it is imperative going forward that macroeconomic policy not be a barrier to economic recovery. Labor- and product-market reforms will be easier to undertake and more effective if the right macroeconomic policies are in effect. Chapter 6 addresses that issue directly.

Skill Differences and the Distribution of Wages

Another structural shock hit the advanced economies in the 1980s—one that intensified the negative impact of the productivity growth decline on employment among low-skilled workers in Europe.

The distribution of wages widened substantially in the US economy in the 1980s and 1990s. As figure 2.8 shows, the wage distribution in the US economy was fairly similar to that of France and Germany in 1973, but the gap widened rapidly among the countries over the next 27 years. The difference between the United States and the European countries is marked. There is some indication that the distribution of wages stopped widening in the United States in the late 1990s, but even so the wage gap between the first and ninth deciles remained much wider than before. The wage gap in France has narrowed pretty steadily while in Germany the gap fluctuated through the late 1980s and has remained rather steady since then. In Britain, the wage distribution narrowed through the late 1970s, but then started to widen, as in the United States. In 2000, however, it remains much closer to the European than to the US pattern.³⁴

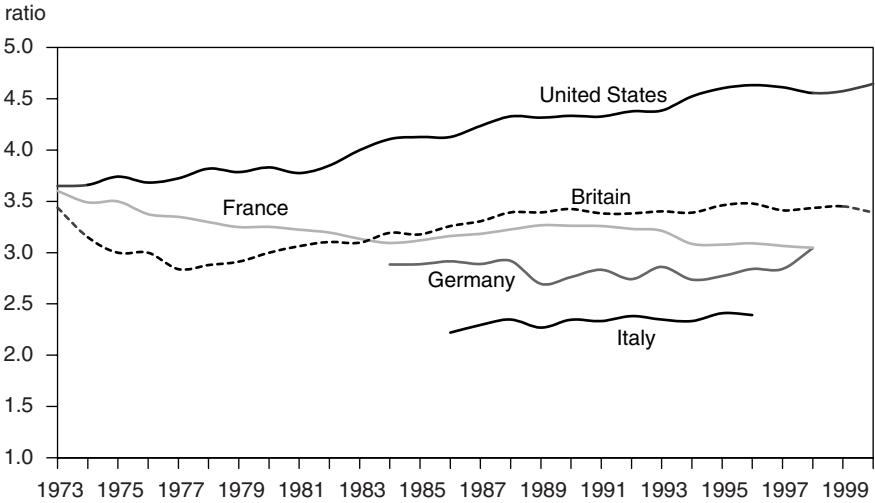
To a degree the differences in wage distribution may reflect differences in the distribution of worker skills within the countries. The US education system is very good at training academically gifted young people for college. Large numbers then go on to obtain two-year and four-year college degrees. However, the US system does not adequately help young people who are less academically oriented acquire skills that will allow them to earn good wages.

Europe, by contrast, has more active labor-market policies. The philosophy is to try to bring even relatively low-skilled workers up to the capability level where they can earn a good wage. The system of institutionally set wage rates is combined with job training programs intended to validate the relatively narrow distribution of wages. This is an admirable goal and the United States could well emulate some of these policies. In general, it makes sense to use active labor-market policies to increase the skill level of the workforce and to do so in a way that helps low-skilled workers improve their relative position as long as it is cost-effective.

It does not make sense to mandate a given wage distribution and then hope that the workforce can acquire the skills to validate this distribution.

34. Data are incomplete for Britain and Italy.

Figure 2.8 Wage distribution,^a select countries, 1973–2000



a. Ratio of the cut-off point in the first and ninth decile gross earnings for both men and women.

Source: OECD Labor Market Statistics (2003h).

Even with the best of intentions and even with expensive training programs, it may not be possible to maintain a narrow distribution of (before-tax) wages in the face of technological advances and globalization affecting Europe and the United States. The attempt to do so may make it very difficult for low-skilled workers to acquire jobs at all.

The reason for the pattern of rising inequality in the United States has been the subject of a large body of research, and the predominant view is that changes in technology have been at work.³⁵ There has been “skill-biased technological change” that has reduced the relative demand for low-skilled workers. The simple basis for this belief is that the relative wages of highly skilled or educated workers have risen even as the supply of such workers has increased rapidly. The relative wage shift must therefore be driven by shifts in the relative demands for low- and high-skilled workers. In particular, it is often argued that the growth of information technology has increased the value of conceptual skills in the marketplace, thereby raising the returns to skills and education. The hypothesis of skill-biased technological change has become conventional wisdom among US economists.

Skill-biased technology change is probably not the only explanation for the widening gap in wage distribution. This is something of a paradox be-

35. See, for instance, Haskel and Slaughter (1998); Autor, Katz, and Krueger (1997); and Berman, Bound, and Griliches (1994).

cause the 1980–95 period is supposedly one when there was substantial skill-biased technological change but little productivity growth. Harvard and IIE economist Robert Lawrence even remarked upon it: “So much bias, so little change.” To reinforce the puzzle, from 1995–2000 both the pace of technological change and the adoption of IT increased, while the wage distribution stopped widening.

So while technology undoubtedly has been an important factor, there are other possible explanations for the widening gap in wage distribution. Expanding international trade may also have caused it. Under certain conditions, open international trade will push down the wages of unskilled workers in developed economies who compete with low-wage unskilled workers in developing countries. This nightmare scenario drives US and European workers’ opposition to international trade.

We do not want to overemphasize this explanation. In practice the overwhelming proportion of employment in the United States and in Europe is not in industries that compete directly with low-wage workers overseas (employment in manufacturing represents only 14 percent of total US employment and only about half of manufacturing trade is with countries where wage rates are much lower). But it is likely that trade has played a role in reducing the relative demand for low-skilled workers. The production of labor-intensive products like toys and apparel has largely moved to low-wage countries such as China. Labor-intensive parts of the value chain—such as the assembly of wiring harnesses for autos—have also disappeared from developed countries. The loss of these jobs has not affected a large enough share of the overall economy to be the main determinant of low-skilled wages in developed economies, but it has made an impact.

Another important development in US wage distribution has been a change in the wage-setting environment. Wage rates in the United States are now influenced much more by market forces and less by institutional factors than was the case 20 or 30 years ago. Essentially, the United States has become less European. One obvious sign of this is the decline of unions. Unions represented 25 percent of the nonfarm workforce in 1973, and declined to only 9 percent by 2001. Even in the nonunion sector, wages were often set bureaucratically and in relation to colleagues with comparable jobs rather than on the basis of supply and demand. As competitive pressure increased throughout the economy in the 1980s and 1990s, companies looked for ways to cut costs and offered workers only what they had to pay to attract adequately qualified people. Business services such as payroll, security, and cleaning were often outsourced to companies that paid lower wages than had been paid to in-house staff. The threat to move activities offshore has been one lever US companies have used to change the institutional wage setting.³⁶ The increased ac-

36. This is now happening in Germany. Siemens used the threat of moving jobs to Hungary to force IG Metall to agree to increase the work week from 35 to 40 hours with no increase in pay.

ceptability of hiring nonunion replacement workers is another factor. President Ronald Reagan initiated this trend in the 1980s when he fired and then replaced the unionized air traffic controllers.

What are the implications for Europe? Presumably the same forces of technological change that affected the United States are influencing Europe as well, and the process of globalization is restructuring the global value chain. There has been greater protection against low-wage imports in Europe than in the United States, but the same forces of international competition are at work on that economy.³⁷ The low-skilled manufacturing jobs that have not already left Western Europe are leaving now as more low-wage labor becomes available in Eastern Europe.

In contrast to the United States, in Europe institutional wage setting remains the norm.³⁸ Also, although Europe's union membership has declined substantially just as in the United States, their power has not declined in the same way. Indeed unions negotiate wage rates that apply throughout the industry to union members and nonmembers alike. In France and West Germany 94 percent of workers were covered by collective bargaining in 1994–95, 82 percent in Italy in 1993, and 47 percent in Britain in 1994.³⁹ Public-sector employment is also more important in Europe than in the United States, and its wages are not determined purely by market forces.

The sectoral perspective on this issue is very important. The forces of international competition in manufacturing have been strong enough to force a great deal of restructuring in this sector in Europe. In most European economies (although not in Germany) the manufacturing employment share has declined about as much as in the United States, releasing many low-skilled workers. The problem for overall job creation is that this has not been accompanied by a rise in employment in Europe's service sector.

How much wage inequality must Europe accept if it is to maintain something close to full employment? We do not know the answer to that question, but clearly the distribution of *before-tax* wages must be wide enough that firms can attract high-skilled workers that can access jobs in the regional or even the global labor market. At the same time firms must be able to pay low enough wage rates to low-skilled workers and still earn a profit after hiring them.

In Europe the principle is still widely accepted that those who work full-time should be able to support themselves and their family on the income received from their job. The idea has a powerful emotional appeal,

37. See OECD (2000a) for a discussion of this issue.

38. See Nickell (1996) for a discussion of this issue.

39. Data from the OECD Labor Force Statistics (2003h). The OECD reports these percentages as workers covered by agreements as a percent of all workers in the economy. This same data source reports that 18 percent of US workers were covered by collective bargaining in 1994.

but it can create serious employment problems and is not the best way to sustain the living standards of the working poor. Rather than mandating the wages that employers must pay, it is better to implement redistributive policies to change *after-tax* family incomes. A high level of inequality of before-tax wages is compatible with a lower level of inequality in after-tax wages. *Therefore, reducing inequality in the distribution of before-tax wages should not be an important goal of economic policy in itself.*

This may oversimplify the difficulties of maintaining economic efficiency while improving the income distribution. Even the best-designed policies will end up having work-incentive effects. Regional and global competition will limit the ability of any single economy to levy high taxes on high-income individuals. In practice, there are limits to how effective redistribution can be before incentives are undermined.

That issue is taken up below, but the key message of this section is important. Europe faces the same economic trends that drove rising wage inequality in the United States as well as slower real wage growth. It has resisted the wage effects of these economic forces, but has not overcome the resulting employment effects. Institutional forces and/or policies can often control either price or quantity, but have difficulty controlling both. The goal of policy should be to reduce poverty and mitigate economic uncertainty, not to set wages or mandate a particular distribution of wages.

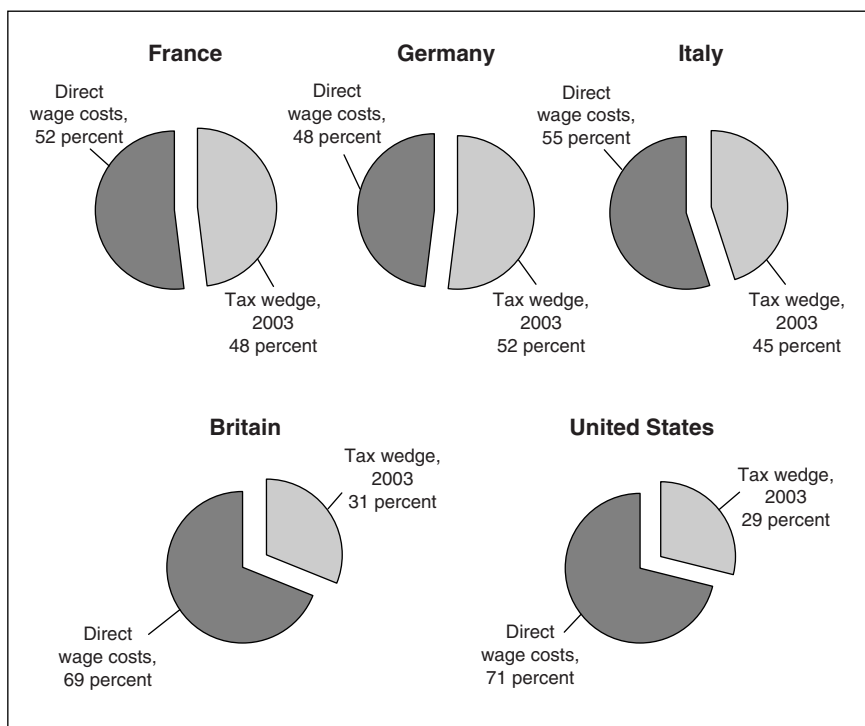
Taxes, Transfers, and the Willingness to Work

At several points in the above discussion we referred to institutionally set wages. We also talked about how the generous level of transfer payments to the unemployed kept low-wage jobs from being filled. These two issues are related. If there were no transfer payments made to the jobless, then they would be forced to engage in some economic activity, whether formal or informal. European economies have softened the effect of slower productivity growth and shifting demand for worker skills on wage rates. In practice, this could not have happened without substantial transfers to the nonemployed since either a political or an economic breakdown would have occurred.

Europe developed a social compact. The workforce accepts that high taxes are needed to finance the income transfers to the unemployed and retired. This social compact has functioned well enough over the past 30 years. Indeed, many Europeans strongly prefer this system to the more market-oriented US system with its greater inequality. However, this European system may not be sustainable. The system's feasibility will be explored in more detail later in this chapter, but at this point we simply want to emphasize its influence.

The European system creates a large tax wedge imposed on workers to support those that do not work. As the proportion of the population not

Figure 2.9 Tax wedge and direct wage cost, select countries, 2003 (percent of total gross labor costs)



Note: Average total tax wedge includes employees' and employers' social security contributions and personal income tax minus transfer payments as percentage of gross labor costs (gross wage earnings plus employers' social security contributions). This assumes a single worker without dependents makes 100 percent of average production worker wages.

Source: OECD (2004b).

working becomes larger this further discourages employment. Also, the employer's cost of hiring a worker starts to greatly exceed the after-tax wage received by the worker. Figure 2.9 shows the tax wedges for France, Germany, Italy, Britain, and the United States in 2003. The wedge is quite substantial for all of the countries—29 percent even in the United States—but it is significantly higher in Europe at *around 50 percent in France, Germany, and Italy*. The tax wedge means that for each euro a worker earns, the employer must pay substantially more than a euro in wage costs. Table 2.4 shows the implications of these tax wedges, showing the employer cost for different levels of after-tax wage rates actually received by the employee. The numbers are quite startling. In order for workers to receive €7.50 an hour in France, Germany, or Italy, the employer would have to pay about €14 an hour.

Table 2.4 Employer wage cost for alternative hourly after-tax wage rates (euros)

Country	€5	€7.50	€10
France	9.62	14.42	19.23
Germany	10.42	15.63	20.83
Italy	9.09	13.64	18.18
Britain	7.24	10.86	14.49
United States	7.04	10.56	14.08

Source: OECD (2004b); authors' calculations.

The difference in size of the tax wedge between the United States and Britain, on the one hand, and continental Europe, on the other, is large (despite declining in recent years in Italy). But there is also a significant difference between the two regions because wage rates are set institutionally to a much greater extent in Europe. When wages are set in the market, a simple supply and demand analysis shows that any given tax wedge will be borne by both the employee (in the form of a lower after-tax wage) and by the employer (in the form of a higher before-tax wage).⁴⁰ In practice, much of the tax wedge will be borne by the employees and not the employer. In the case of market-determined wages, the tax wedge may discourage employment, but it will be driven by those dropping out of the workforce, discouraged by the insufficient incomes they receive. In the case of institutionally set wage rates, such as the legal minimum wage, any payroll taxes incurred by the employee will boost the effective minimum wage paid by the employer. It will lower employment by discouraging hiring by employers.

Low-wage rates, long hours, minimal paid vacations, and the absence of health insurance are not uncommon in the United States. These are hardly attractive features of the US labor market.⁴¹ Europeans would not work at a minimum-wage job with neither paid vacations nor healthcare coverage. Therefore, it is not surprising that policymakers reject efforts to take away the relatively more attractive features of employment in Europe.

It is important, however, for European countries to face the consequences of the policy choices they have made. If the European Union seriously wants to increase employment by over 20 million by 2010, it must provide the right incentives to achieve this goal. The current European labor-market and social-insurance policies raise employers' cost while raising the returns

40. Many people believe that payroll taxes are paid entirely by employers because they write the check to the government, but that is not the case. When wages are market determined, the shares paid by the two sides depend on the elasticities of labor demand and supply.

41. The United States has its own nonemployment issues. The proportion of nonelderly adults receiving some form of disability assistance rose to around 4.5 percent of the population in 2000 (Katz 2002), and the number of persons incarcerated in the United States has risen to over 2 million.

from nonemployment, which reduces employment. The difficult task is to find alternative ways to sustain the living standards of low-skilled workers that are more consistent with maintaining the level of employment.

Europeans may have inherently different tastes for work and income than Americans. There is no right or wrong viewpoint. But, as noted in Chapter 1, the choices about leisure that have developed in Europe have occurred in an environment where work incentives have been altered substantially by the policy environment and are not optimal for the society as a whole. The short workweek and long weeks of vacation in Europe are well known. These “benefits” are generally negotiated and individuals are not given a choice. Declines in the workweek have been mandated as a measure to increase employment. It is also falsely presented to workers as a free ride without a loss of wage income. Democratic societies choose the leaders that make the policies, but few voters understand the full implications of the policies they support or oppose.

Demographic Changes: Extended Life Expectancy and Changes in Cohort Size

The previous section argued that the tax wedge between what employers pay and what workers receive is very high in Europe. One reason for this difference is the demographic changes taking place: life expectancy and the age of retirement have both shifted over time. Going forward, the demographic issue will become even more important as life expectancy continues to rise and the number of persons approaching retirement age increases. In addition, healthcare costs, which apply very disproportionately to the elderly, are rising rapidly. Therefore, standing still is not an option.

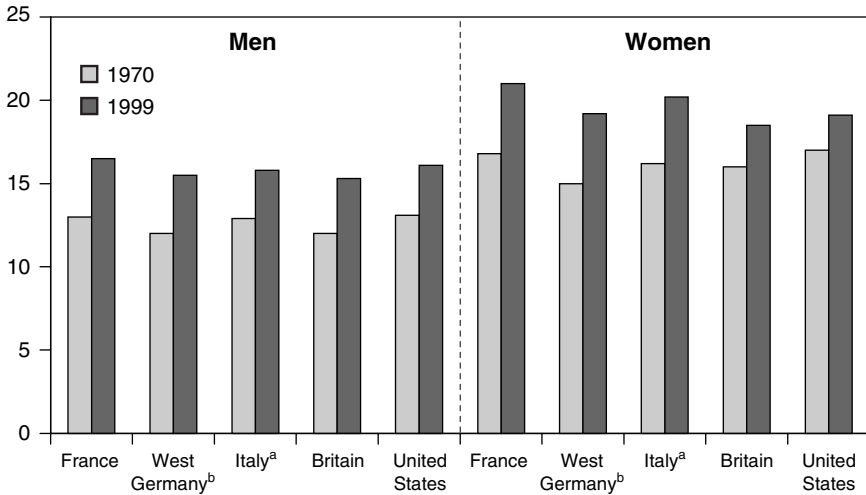
The demographic changes taking place in all the advanced economies will increase the burden of supporting the nonworking population, unless policy or other changes occur. First, life expectancy has increased and, for a given age of retirement, people are living longer in the retirement phase of their lives. Second, the age of retirement has declined, so people are retiring earlier than they used to. Third, the aging of the baby boom generation and the decline in fertility rates after that generation mean that the size of the cohort of retirees is increasing as a proportion of the population. Fourth, the cost of health care for the elderly is growing rapidly.

Life Expectancy

In 1970, the life expectancy in West Germany at age 65 was 12.0 years for males and 15.0 years for females. By 1999 these figures had increased to 15.5 years for males and 19.2 years for females. For a German 65-year-old male, the expected duration of remaining life rose by a factor of 1.29 over

Figure 2.10 Rising life expectancy after age 65, 1970 and 1999

years of life expectancy



a. 1975 and 1997.

b. Data for West Germany are only for 1970.

Note: Average number of years in which a person at 65 years of age is expected to live under the mortality pattern prevalent in the country. Based on a given set of age-specific death rates in life tables.

Source: OECD Health Data (2002e).

this period—a substantial increase. The proportional increase in life expectancy for German females is about the same. Figure 2.10 shows the data and comparable figures for France, Italy Britain, and the United States. All of the countries show large increases in life expectancy at age 65. There are a variety of reasons for increased longevity, including improved nutrition and, significantly, improvements in health care. For example, there have been rapid declines in deaths from stroke and heart disease in all of these countries. Life expectancy also continues to increase, and possibly even accelerate, with advances in biotechnology.⁴²

Longevity provides a net benefit to humanity, but it also creates an economic problem: people need a higher level of lifetime income to maintain a given level of consumption over a longer span of years. The economic challenge may be even more severe if you take into consideration the number of years that someone may need 24-hour care or extensive medical care to remain alive. Harvard Medical School cardiologist Dr. Eugene Braunwald seems to confirm this challenge when, referring to the drop in deaths from heart attack, he says: “These people aren’t cured. They are

42. See the discussion of this issue in Aaron and Schwartz (2004).

Table 2.5 Average retirement age, select countries, 1965–99

	1965–70	1970–75	1975–80	1980–85	1985–90	1990–94	1995–99
Men							
France	65.4	63.5	62.3	59.7	59.6	59.1	59.3
West Germany	65.0	62.8	61.7	62.2	62.0	60.1	60.5
Italy	62.8	62.3	62.2	60.8	60.2	57.9	59.3
Britain	n.a.	n.a.	n.a.	62.5	62.5	61.2	62.0
United States	67.4	64.2	64.4	63.7	64.2	63.6	65.1
Women							
France	68.1	63.8	63.6	60.6	60.1	60.4	59.8
West Germany	61.9	62.7	60.4	59.9	61.6	60.1	60.8
Italy	58.5	59.7	64.3	59.5	58.8	57.2	58.4
Britain	n.a.	n.a.	n.a.	60.2	61.8	61.2	61.2
United States	67.4	64.3	62.3	64.2	65.7	64.5	64.2

n.a. = not available

Notes: Dynamic estimates are as described in source. West Germany and Italy 1965–70 and 1970–75 data static estimates as described in source; Britain 1980–85 static estimates as described in source.

Source: Scherer (2001).

maintained alive. We have converted heart disease from an acute illness to a chronic disease."⁴³

Retirement Age

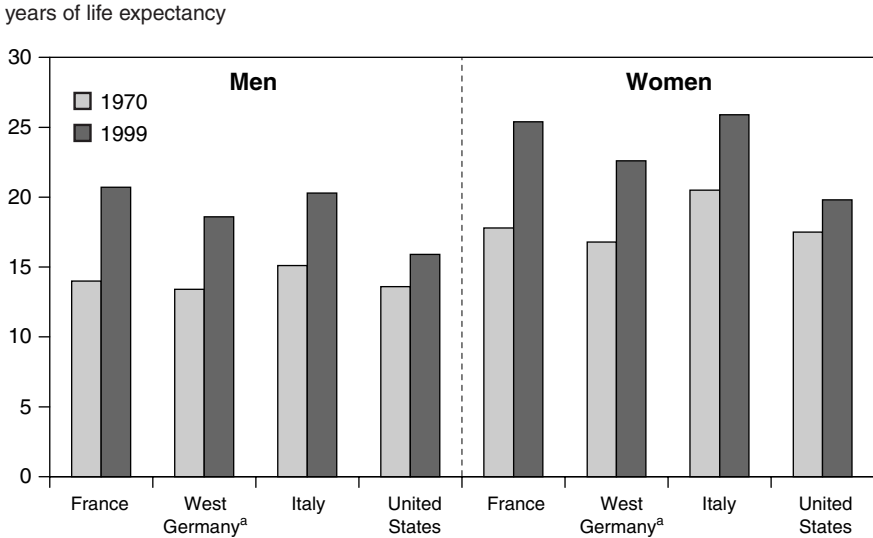
Table 2.5 shows how retirement ages have changed over the past 35 years. In West Germany, males on average retired at age 65.0 in the period 1965–70, a figure that had fallen to 60.5 by 1995–99.⁴⁴ This pattern of decline in retirement age is also evident in France and Italy and to some degree in the United States. It is noteworthy, however, that the pattern of decline stopped in the 1990s. The big declines in retirement age in Europe were from the late 1960s until the late 1980s. The data for Britain are incomplete and show no clear trend in retirement age. In the 1995–99 period, the retirement ages in Britain for both men and women are higher than in continental Europe, but less than in the United States.

The retirement patterns for women are somewhat different from those for men, with a sharp decline in the retirement age in France, but no decline in Germany, Italy, and Britain.

43. See "Gains on Heart Disease Leave More Survivors, and Questions," *New York Times*, January 19, 2003, www.nytimes.com/2003/01/19/health/19HEAR.html.

44. OECD made these "dynamic" estimates. The methodology for their calculation and the rationale for using them are discussed in the source given in the table. Taking a simple average retirement age can be misleading when there are trend increases or decreases in labor force participation by different cohorts of the population.

Figure 2.11 Rising life expectancy at effective retirement age, select countries, 1970 and 1999



a. Data for West Germany are only for 1970.

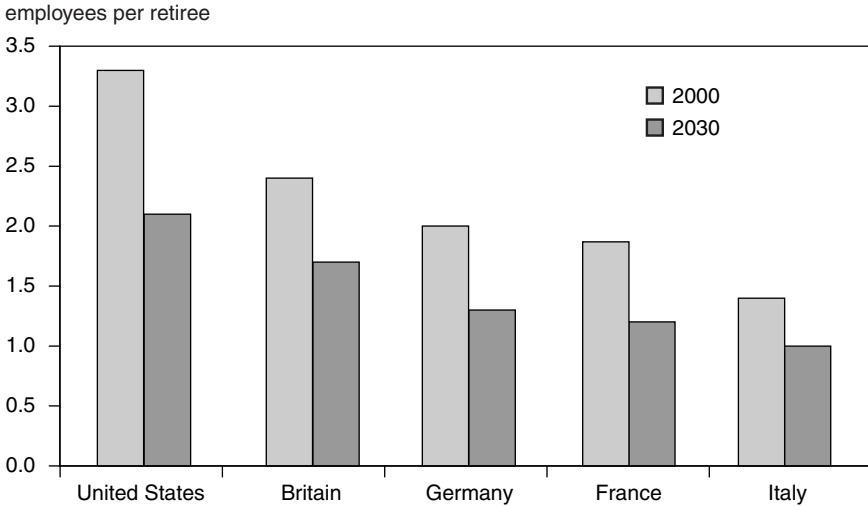
Source: OECD (2002f).

Figure 2.11 combines the increase in longevity and the declines in retirement age to show the changes in life expectancy at effective retirement age. In France, for example, males could be expected to live 14.0 years after retirement in 1970, a figure that had risen to 20.7 years by 1999. The expected length of retirement increased over this period by a factor of 1.48, almost a 50 percent increase. The increases are a bit smaller in Germany and Italy, but still large. The increase in the United States is much smaller at 17 percent. The figures for women are similar to those for men. *These figures indicate that the impact of early retirement and increased longevity have increased the cost of retirement pensions by 30 to 50 percent in Europe over the past 30 years, abstracting from changes in the level of pension benefits.*

Rising Proportion of Elderly

The data presented so far are historical. The biggest demographic challenge is ahead, however, given the rapidly increasing proportion of elderly in the population. The effects described so far are water under the bridge. The most serious problem lies ahead. Figure 2.12 shows the projected increase in the ratio of retirees to employees from 2000 to 2030 for France, Germany, Italy, Britain, and the United States. Three alternative

Figure 2.12 Number of employees for each retiree,^a select countries, 2000 and 2030



a. Retirees defined as the number of people aged 55 and above who are not employed.

Source: OECD (2001d) for the United States, Britain, Italy, and Germany. Eurostat (2004a) for baseline scenario for France.

scenarios are shown in OECD (2001d) based on scenario analysis, with the different scenarios based on varying assumptions about future employment and retirement patterns. Taking scenario 2 as the baseline case, we see the ratio of retirees to employees in Italy will rise from 71.1 percent in 2000 (already very high indeed) to 103.8 percent by 2030. Thus in Italy in 2030, the central projection is that there will be just over one retiree for every person working. The data for Italy are open to some question, however, since there is some question of how well employment is measured there.⁴⁵ The picture for Germany is also pretty striking. The ratio of retirees to employees is expected to rise from 51.1 percent to 76.1 percent, dropping the ratio of employees to retirees from 2.0 in 2000 to 1.3 in 2030. The ratio in France will drop from 1.9 to 1.2 in 2030.

Looking at the United States, the demographic shift is *proportionally* similar to that in Germany. The ratio of retirees to employees rises from 30.7 percent to 47.1 percent, dropping the number of employees for each retiree from 3.3 to 2.1. The United States had a very pronounced baby boom pop-

45. Italy's underground economy is thought to be very large. Of course, if recorded employees are the only ones paying taxes, then the figures shown in figure 2.12 may be the right ones to think about. See the appendix in chapter 5 for an elaboration.

ulation surge and will face significant problems in adjusting to this new demographic. Unlike Europe, however, the demographic shift begins from a very different beginning point, with a ratio of employees to retirees of 3.3 in 2000, compared to 2.0 in Germany. In Britain, the demographic shift going forward is as great as in the United States and Germany, while the beginning point for Britain is intermediate between Germany and the United States.

Health Care

Eurostat (2004a) estimates that the number of people 65 or over in the European Union will reach almost 103 million in 2050, compared with 61 million in 2000, nearly a 60 percent increase. In the same period, the working-age population between 15 and 64 years of age is projected to decline from 141 million in 2000 to 118 million in 2050. This means the ratio of the population over 65 to that between 15 and 64 years of age will double from 43 percent in 2000 to 87 percent in 2050.

Of the total in 2050, the number of people over 80 is expected to increase from 14 million in 2000 to 38 million in 2050, a 171 percent increase. The ratio of persons over 80 to persons 15 to 64 years of age will rise from about 10 percent to 32 percent.

We have commented already on the impact of this demographic change on pension obligations, but the impact on healthcare costs is just as impressive. Figure 2.13 shows how healthcare spending varies with age in a number of European countries and the very sharp increases in spending that occur with increasing age are striking. Persons over 80 consume about 3 times as much in healthcare costs as persons 15 to 64 years of age. Persons 65 to 80 years of age consume about 2 times as much.

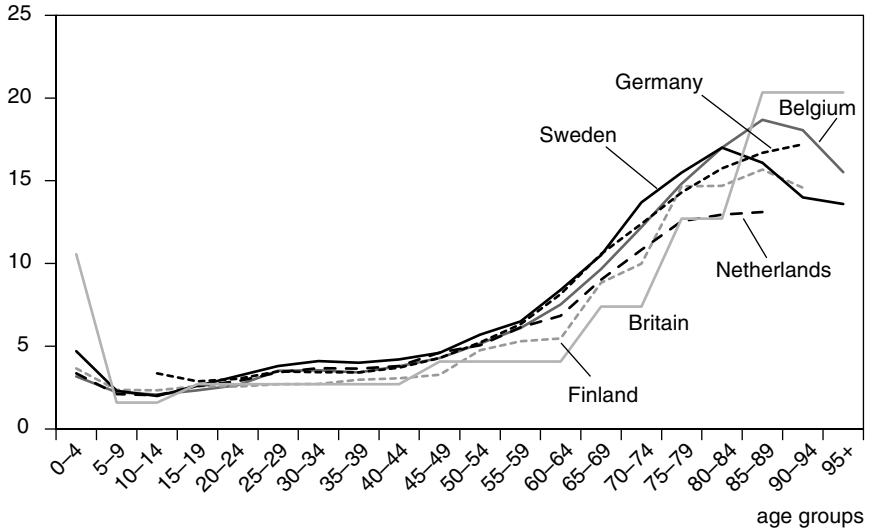
Healthcare costs will rise not only because there will be a larger number of retirees but also because of the increasing age of the retirees themselves. Good estimates of the future growth of total healthcare costs for the elderly are not readily available for Europe. But clearly, the spending increases generated by this demographic change are likely to be supplemented further through the development of new but costly technologies. As noted earlier, this technological progress is a net benefit to the society but will add to the tax burden on workers as they support the larger elderly population.

Conclusion

The rise in the number of retirees with an extended life expectancy, younger retirement age, and the rising proportion of elderly has already added to the large tax burden faced by employers and the workforce. Going forward, the cost of supporting retirees will increase dramatically unless offsetting changes are made.

Figure 2.13 Age profiles for public per capita health expenditure, select countries^a

average expenditure per capita
as a share of GDP per capita



a. Data for Germany, Belgium, Sweden, Finland, and the Netherlands from 2000.

Note: Where the age profile is flat at the tail end of the profile this indicates that a breakdown across age groups was not available at the highest ages. The British age profile has several flat segments as the British breakdown across age groups differs somewhat from that of the other countries.

Source: European Commission (2001b).

The Possibility of an Unstable Labor Market: A Warning Parable

Three related reasons have been identified in this chapter for causing low levels of employment and reduced working hours: average real wages paid by employers are too high to sustain full employment; wage distribution is too narrow to sustain labor demand among low-skilled workers; and levels of benefit payments to the nonemployed are high enough to discourage them from taking low-wage jobs. This section explores the third of these reasons and describes conditions under which high benefit levels might trigger an unstable decline in employment. It is based on a simple model and not on direct evidence that the actual labor market in any of the European economies is unstable. Thus, it provides a warning parable about what needs to be done to avoid possible instability.

A key aspect of the labor market's stability is the work incentive for individuals—the relation between income earned as an employee and the level of benefits provided to those nonemployed. Benefit levels that are too high relative to after-tax wages will eventually drive too many people out of the workforce and tax those that work so heavily that the incentive to work is undermined. In this section a model that captures this possibility is explored.⁴⁶

The model is set out in equation form in appendix 2.1, but the main ideas and findings will be described in this section. Readers who are strongly averse to formal economic analysis or supply and demand diagrams should skip this section of the chapter.

Labor Supply

The level of labor supply (measured as hours worked per capita) is assumed to depend on four variables:

1. the real after-tax wage,
2. the benefit level paid to those who do not work,
3. the labor supply in one period depends upon the labor supply in the previous period. (This means the supply of labor is assumed to adjust gradually to changes in work incentives.), and
4. a demographic variable reflecting the age distribution of the population.

With respect to the first two determinants of labor supply, wages and benefits, a strong simplifying assumption is made—namely that *labor supply depends positively on the ratio of the after-tax wage to the level of benefits received by those who are not employed*. Essentially, a larger work incentive raises labor supply. This ratio is called the *work-incentive ratio* and reflects the trade-off people make when they decide to work or not work.

This assumption oversimplifies the issue in some important respects. In particular, it is possible that labor supply might change if both the after-tax wage and the benefit level were to change, even though their ratio stayed the same. Labor supply is different from the supply of ordinary commodities because there are income and substitution effects at work. A higher wage does encourage people to work more because each extra hour worked yields a higher return (the substitution effect). But on the other hand, a higher wage means people have higher incomes and can afford to take more leisure time (the income effect). It is certainly possible and even likely that in a very high-productivity, high-wage economy, people would choose to reduce their time at work. This view is excluded from this model in order to focus on the implications of the main alternative explanation of

46. The model developed by Olivier Blanchard and Lawrence Summers (1987) has some similarity to, but is not the same as, the one used here.

the decline in work hours—the consequences of a too-low work-incentive ratio. Perhaps the most compelling reason to think this last explanation is important is that most of the jobless in Europe are the lower-skilled and less affluent persons in the economy—not primarily the idle rich.

With respect to the third determinant of labor supply, the model captures the fact that it will not change abruptly in response to changes in work incentives. For example, if benefits paid to the nonemployed are increased beyond a certain point, this will not cause a sudden drop in labor supply. Rather the labor supply would gradually decline over time. Capturing the gradual adjustment is important because the impact of policy changes on the labor market can be masked by lags. It has been noted that Europe had generous benefit levels for some time before low employment became a problem. In part that is because wage growth was faster and employment opportunities were greater prior to 1973, but in part there may have been a long time before the full effects of labor-market policies were realized.

The model makes a specific simplifying assumption about how labor adjusts over time. It assumes that *the rate of change of labor supply over time depends on the work-incentive ratio*. In particular, if there is a strong incentive to work (a high work-incentive ratio) then this encourages people to look for jobs and labor supply increases over time (the rate of change of labor supply is positive). If, however, people see only a small economic advantage from working then the number of people seeking work will decrease (the rate of change of labor supply is negative). This specification therefore implies that there is a critical value for the work-incentive ratio. *Labor supply declines when the work-incentive ratio falls below a critical value*. Labor supply increases when the work-incentive ratio rises above the critical value. When the work-incentive ratio is at the critical level, then labor supply remains unchanged (is stationary relative to the population).

The relationship of labor supply to demographics will be developed further once the basics of the model have been explored, but clearly they will play a role. For example, the bigger the fraction of the population that is 65 or older, the smaller will be the supply of labor (fewer hours per capita) for a given value of the work-incentive ratio.

Labor Demand

Labor demand depends negatively on the real before-tax wage. Therefore, as hiring costs rise employers will reduce their demand for labor. Labor demand depends positively on multifactor productivity. Therefore, improved business processes or technology are assumed to increase the profitability of production and have a positive impact on overall labor demand (a productivity increase shifts out the demand for labor for any given wage). This result is standard in economic models at the aggregate

or whole economy level. As we discuss in chapter 3, productivity increases can lower employment in specific firms and even industries. But for the economy as a whole, a higher level of productivity lowers unit labor costs and makes employment more profitable at a given wage.

A Balanced Budget Condition

It is assumed that taxes on labor income must pay for benefits to the jobless. This budget-constraint condition is important to the model and serves as a good starting point. Different assumptions could be made, and we explore these alternatives after the results of the basic model have been presented. In practice, most of the tax money that finances unemployment, health insurance, disability, and retirement benefits comes from taxes on labor—specifically payroll taxes.

A Stable Case

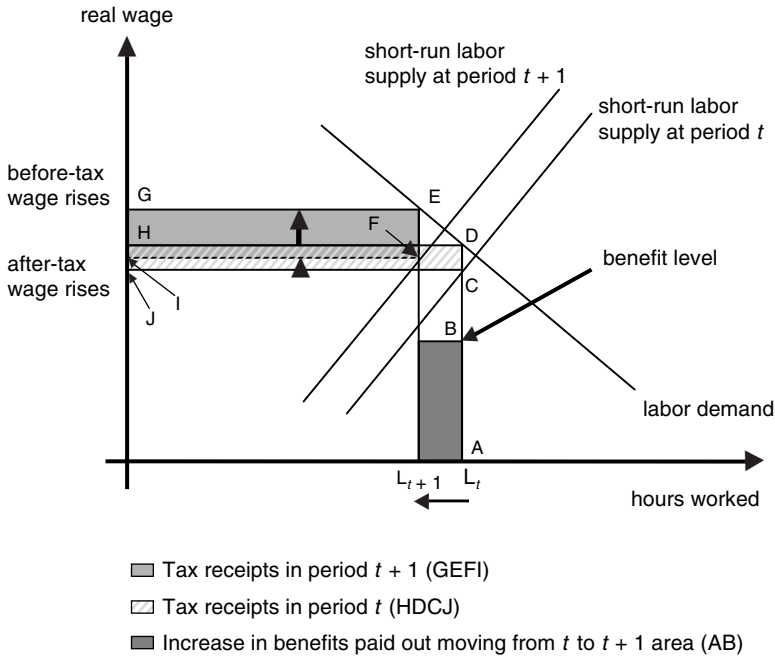
A stable labor market is illustrated by figure 2.14. The economy is assumed at time t to be at employment level L_t (point A). The level of the after-tax wage is shown at point C, while the before-tax wage is shown at point D. The difference between the two is the tax wedge. Total payroll tax revenue is defined as “tax receipts in period t .” The benefit level per person is shown in the figure by the distance AB, but the total amount of benefits paid out to the nonemployed at time t is not shown in the figure. By assumption the payroll tax revenue (HDCJ) is just enough to finance total benefits to the nonemployed.

The economy changes over time because the employment level L_t and the after-tax wage at that employment point lie on the short-run labor supply schedule, but not on the long-run supply schedule. By assumption, the work-incentive ratio is below its critical value and labor supply is declining over time. The impact of this change is also shown on figure 2.14. The number of hours worked declines to L_{t+1} in the next period. As a result of this employment decline, the number of nonemployed increases and the total benefits paid out also increase. This increase in benefit payments is the shaded area marked in the figure to the left of AB and marked explicitly. Because there are fewer hours worked and more benefits paid out (the benefit paid per person stays the same but there are more benefit recipients), the tax wedge increases from DC to EF.⁴⁷

The drop in employment has increased the before-tax wage as the economy moves (up to the left) along the labor demand schedule. In this stable case, the rise in the before-tax wage is enough to result in an increase

47. By construction in the figure, the total payroll tax revenue at time $t+1$, area GEFI, is greater than the area HDCJ by just enough to pay for the increased benefits required for the additional persons not working.

Figure 2.14 A stable labor market: As employment falls, the work-incentive ratio rises until it reaches its critical level



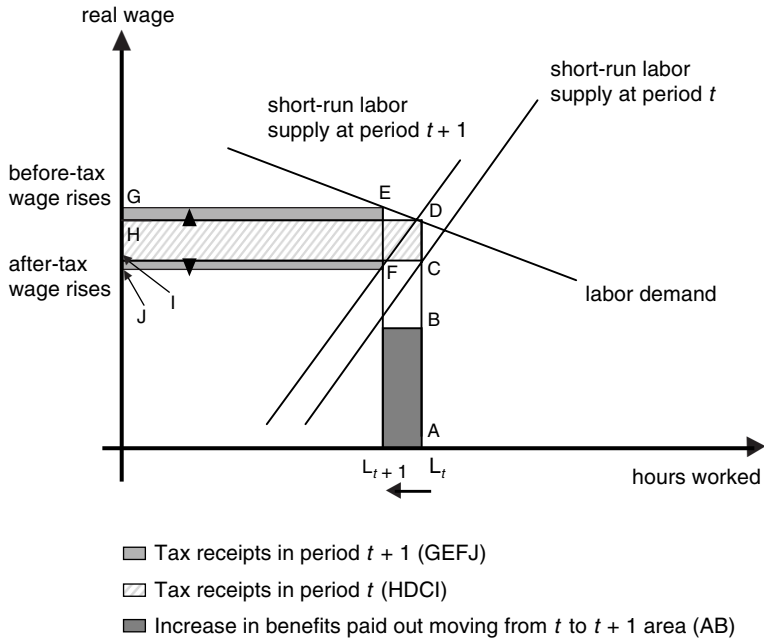
in the after-tax wage also, even though the tax wedge has increased. With the benefit level fixed, this means the work-incentive ratio has increased over time. As the work-incentive level rises, it reaches the critical value and the decline in labor supply ceases. The economy has reached a stable equilibrium.

This stable case is the one that is generally assumed to apply to economies that pay benefits to the nonemployed. There is a distortion to labor supply decisions and a reduction of work effort, but the offsetting advantage to the society is that there is greater income security to those who do not work from the availability of guaranteed benefits. Many may regard such benefits as worthwhile and the distortion of individual decisions as the price paid for greater security. In fact, many Europeans say they are willing to make this trade-off—providing a higher guaranteed income in return for lower employment and lower GDP per capita.

An Unstable Case

Figure 2.15 illustrates the possibility of a labor market with an unstable employment decline. Just as in the previous case, the economy is assumed at time t to be at an employment level L_t (point A). As before the work-

Figure 2.15 An unstable labor market: As employment falls, the work-incentive ratio falls



incentive ratio is assumed to be below its critical value. Employment is at a point on the short-run labor supply schedule but not the long-run schedule, and labor supply is declining. After a period of time (at $t+1$) the economy has moved to the employment level L_{t+1} . As in the previous case, the before-tax wage has increased with the decline in employment (from D to E), but now the after-tax wage has actually declined (from I to J) because the increase in the tax rate is greater than the increase in the before-tax wage rate. Hence, the work-incentive ratio has fallen.⁴⁸ Employment will keep declining until a policy shift—such as a reduction in benefit levels (or even a shift in labor supply or demand conditions not captured in this model)—arrests it.

How does instability arise? As employment falls, real wages rise, which helps increase the work-incentive ratio.⁴⁹ But in addition, more and more

48. By construction in the figure, the total payroll tax revenue at time $t+1$, equal to $GEFJ$, is greater than the area $HDCI$ by just enough to pay for the increased benefits required for the additional persons not working.

49. We have asserted several times in this book that one reason for Europe's high average labor productivity is low employment. Some people disagree, arguing instead that productivity is insignificantly affected by employment reductions and that average labor productivity is high in Europe for other reasons. Maybe so, but if that argument is correct, then the key factor stabilizing employment in the model pretty much disappears.

people collect benefits and the tax rate for workers increases—lowering the work-incentive ratio. The stability of the process depends on which of these forces is larger. The difference in the two figures is that the labor demand schedule is flatter (more elastic) in figure 2.15. A given fall in employment has induced a smaller rise in the before-tax real wage. Economic modeling can never give definitive answers to complex empirical situations, but, as the appendix shows, it is surprisingly easy to find examples of instability, where the work-incentive ratio will keep falling if it is set initially below its critical value.

To clarify: Europe is not currently caught in an unstoppable employment decline. The decline in the work-incentive ratio can always be halted or reversed by policy changes. Payroll taxes were in fact reduced in many European economies in the 1990s. One way to create a more stable situation would be to finance a greater fraction of benefits with value-added taxes rather than payroll taxes. Then benefit recipients would share the cost of their own benefits by paying taxes on their own consumption purchases. This limits the erosion in the work-incentive ratio.⁵⁰ This simplified model has ignored many of the ways in which policymakers in practice encourage people to work rather than collect benefits. For example, policy may mandate that the unemployed accept any available jobs.

But while the model should not be overinterpreted, neither should its lesson be ignored. The model is a warning parable. It points to the danger of creating a vicious cycle in any situation where generous social welfare benefits are supported by taxes on wages. It may explain why efforts to increase employment in Europe by increasing work incentives in the 1980s did not work as well as expected. If a continuing decline in employment was under way at the time, the restraints on social-welfare benefits may only have been enough to slow or flatten out the employment decline but not enough to generate a reversal.

The Impact of Changing Demographics

The framework of the model allows an evaluation of other structural changes. For example, a change in the population demographic will affect labor supply. The increasing percentage of elderly in an economy will lower the supply of labor relative to population for any given work-incentive ratio. With a larger fraction of the population retired and receiving tax-financed benefits, higher tax rates will be imposed on workers, thereby lowering the work-incentive ratio for any given level of real

50. Value-added taxes do still lower real wages, but they fall more or less equally on both wage and benefits receipts, so they do not materially affect the work-incentive ratio.

benefits. The demographic changes coming over the next decades therefore carry the danger that they will push the work-incentive ratio below its critical value and start a dynamic of employment decline.

Although policymakers do not think in terms of economic models like the one described here, the serious concerns currently being voiced about pensions and their possible cuts are described very much in the terms used in this model. In Italy, where estimates show that one retiree will be supported by only one worker, and in France, where pension benefits are very high, the danger is real.

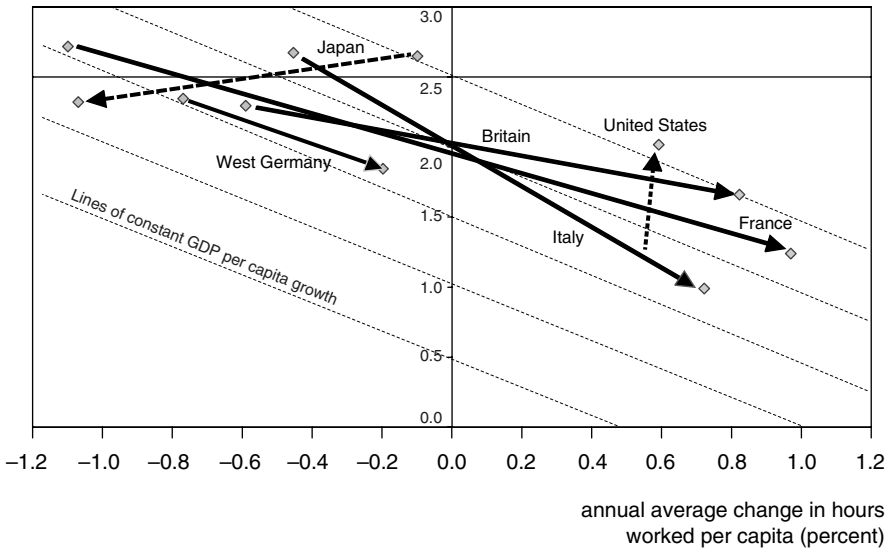
Increases in Productivity

Rapid productivity growth reduces the possibility of unstable employment declines and could offset the impact of changing demographics. There was an important buried assumption in the model as it was described. Labor supply was defined as hours of work supplied relative to the population. But the labor demand schedule was drawn as a stable schedule in figures 2.14 and 2.15. This assumption is valid only if labor demand is moving out over time at a rate fast enough to accommodate the rise in population. Since population growth in Europe is very slow, that is a pretty easy hurdle to reach, and in practice the demand for labor is likely to move out faster than this, as a result of trend productivity and technological improvement. Therefore, there is room to accommodate gradual increases in before-tax wages without reducing employment. Productivity growth can work to increase the work-incentive ratio over time, or it can offset the tendency for the work-incentive ratio to decline as the number of retirees increases. An important caveat to that point, however, is that if benefit levels are increased in line with wage increases then the work-incentive ratio stays the same.

Even though productivity improvements accrue by only small percentage point steps each year—going from a one percent rate of increase to, say, a two percent rate would be a major achievement—productivity growth is potentially the key to returning Europe to full employment. Based on the model, it would allow real wages and the incentive to work to rise without reducing labor demand. In the actual economy it would be even more important. The decline in productivity growth was a key trigger to the rise in inflation and unemployment in the 1970s that started the negative economic cycle. An increase in productivity growth would go in the opposite direction, raising GDP growth, lowering inflation and allowing more expansionary policies, and improving profitability and investment. These effects were all seen in the United States starting in the mid-1990s. Moreover, faster productivity growth works wonders for fiscal problems, potentially turning deficits into surpluses. This could open the door to lower taxes on wages and further improvements in work incentives.

Figure 2.16 Comparative effect of productivity growth and labor utilization pre- and post-1995, select countries

annual average percent change in GDP
per hour worked



Note: 1973–95 = starting point, 1995–2000 = end point.

Source: University of Groningen and the Conference Board (2004).

Economic Performance since 1995

So far, the analysis of Europe’s economic difficulties has largely been based on what occurred during the 20-plus years from 1973 to 1995. But circumstances have changed since 1995, and we need to look at how the most recent period affects the story. In particular, there was a strong boom in the industrial economies through 2000, followed by a slowdown that continued through early 2004.

Earlier in this chapter figure 2.2 showed how output-per-hour growth had declined in the major industrial economies after 1973, and that hours worked per capita had declined in most of them also, with the United States as the main exception to the decline in hours. Figure 2.16 is structured similarly to figure 2.2, with the starting point of each arrow giving the combination of output-per-hour growth and hours-per-capita growth (or decline) that prevailed over the period 1973 to 1995 in each country. The endpoint of the arrow then shows how these same variables performed over the 1995 to 2000 period.⁵¹

51. The data reflect recent revisions, including new estimates of the US population.

Box 2.2 Measurement issues

Although there are systematic efforts under way to harmonize economic measurement across countries, notably the System of National Accounts, there remain in practice important differences in methodology across countries for both output and input measures. That raises the question of whether or not the faster productivity growth experienced in the United States since 1995, compared to Europe, is just a result of differences in measurement methods. In particular, not all European countries use the same approach to computer output measurement as the United States. The United States uses a mixture of “matched models,” which compares the price over time of a given computer, and hedonic regressions, which capture the quality-adjusted price of new computer models. The rapid productivity growth that occurred in the US high-tech sector contributed directly to the acceleration of overall productivity growth in the 1990s. This contribution to growth is captured by the rapid declines in the adjusted price of computers and related equipment.

The most comprehensive effort to examine the importance of measurement issues to productivity comparisons was carried out by a team at the Organization for Economic Cooperation and Development (OECD) (Ahmad 2003). They reach an important conclusion: They find that at the aggregate level “measurement problems do not significantly affect the assessment of aggregate productivity patterns in the OECD area.” The OECD team notes that there are significant differences in the ways in which output and labor inputs are computed across countries but these tend to have an offsetting effect on the overall numbers. There are ways in which the European approach understates growth relative to the US approach, but there are also measurement differences that go the other way. The OECD team cautions that analyses at the sector or industry level or studies that evaluate the sources of productivity growth may have to ensure that measurement differences are taken into account.

A major study of growth in the European Union and the United States edited by O’Mahony and van Ark (2003) tried to tackle the question of whether differences in the high-tech price deflators could explain the relative differences in productivity growth between the two regions. Contributors to this volume actually used US price deflators and applied them to European industries to recalculate how fast productivity grew in Europe, with comparable price assumptions. Using the US deflators made some difference, but did not eliminate the result that European productivity had slowed in the 1990s and lagged behind US growth after 1995.

(box continues on next page)

The figure shows that the employment situation (hours worked per capita) increased greatly in France, Italy, and Britain, with France going from the fastest rate of hours decline in the pre-1995 period to the fastest rate of increase in the post-1995 period. Germany also moved to the right, but remained in negative territory. (Japan showed a sharp decline in hours worked per capita.) The fact that Europe was able to share in the 1990s boom and raise employment is a sign that macroeconomic conditions are important, and suggests that efforts to increase labor-market incentives and flexibility may have been paying off. Employment growth in the United States over this period continued to be high, but since the economy had reached a point not far from full employment by 1995, the employment increase was only slightly faster than the growth of population.

Box 2.2 (continued)

A study by Jorgenson (2003)¹ has also applied US high-tech deflators to other countries and found bigger differences from the standard productivity measures than reported by the OECD. Jorgenson suggests that IT investment in Europe provided a significant source of productivity improvement in the 1990s. Jorgenson's study used faster rates of "hedonic" price decline than O'Mahony and van Ark and he also added consumer durables, which raises his measure of real GDP growth in Europe and Japan.

In terms of the implications for this study we draw the following two conclusions. First, based primarily on the work by the OECD as well as by O'Mahony and van Ark, we conclude that the standard growth data at the aggregate level portray a relatively accurate picture about the United States and Europe. The United States experienced slower productivity growth than Europe for many years, but its growth started to improve sharply after 1995, in contrast to Europe, where it seems to have slowed, at least in the large continental economies. If the period of rapid US productivity growth had ended in 2000, one could perhaps make the case that the new economy of the late 1990s was a temporary blip that was partly the result of the computer deflators. However, since rapid US productivity growth has continued and even strengthened since 2000, this suggests that a new trend of faster growth has occurred. This US resurgence may provide useful lessons for Europe. (Moreover, the rapid productivity growth since 2000 has not been driven by a surge of production in the high-tech sector—indeed the opposite.) Second, we want to reiterate that this study is not about resolving a horse race between US and European growth. Rather, it is intended to help transform the European economy. If there are ways in which Europe can boost its productivity growth rate (and we believe there are), these will help resolve its labor-market problems and improve its standard of living, regardless of how the United States performs.

In chapter 3 we discuss ways of raising productivity in Europe using extensive use of case study analysis. The analysis applies a common measurement approach across countries.

1. See also Jorgenson's Web site at Harvard, which reports revised results as of March 15, 2004. <http://post.economics.harvard.edu/faculty/jorgenson/papers/handbook.extract03152004.pdf>.

The productivity picture after 1995 differs from that shown in figure 2.2. Whereas all the industrial economies experienced a decline in growth after 1973, there was a divergence of experience after 1995. The productivity slowdown *worsened further* in the large European economies and in Japan. In contrast, productivity growth improved in the United States.⁵²

To a degree, the slowing of labor productivity growth in Europe in the late 1990s can be seen as a natural consequence of increasing employment, particularly in Britain, France, and Italy. More low-skilled workers were brought into the workforce. However, this factor alone was not enough to

52. The United States was not unique in this regard. Other economies, such as Ireland and Australia, not shown in the figure also had productivity accelerations in the late 1990s.

trigger a slowdown in productivity. That certainly seems to be true in Germany, which did not experience the same strong employment growth of Britain and France. In addition, the US experience suggests it is possible to achieve solid productivity growth even when employment is expanding. Even though the rate of employment increase in the United States was not as fast as in France and Italy, the fact is that US employers were often desperate for workers and hired people with low levels of education and work experience. Even so, US employers managed to increase output per hour fairly rapidly.

Figure 2.16 does not include data from the years since 2000. The information is omitted because preliminary data are often revised, so it is hard to be sure what the most recent figures are really saying. It is also omitted in part because there are cyclical movements that affect different regions at different times, which makes interpretation difficult: GDP growth since 2000 has been much weaker in all developed countries. The US economy went into recession in 2001 (earlier than Europe) and seems to be recovering strongly as of mid 2004. Europe's growth held up better in 2001, but France, Germany, and Italy have experienced GDP declines in the first half of 2003 with recovery still rather sluggish. (Britain has had some cyclical weakness also but has done relatively well from a cyclical viewpoint.)

Picking out productivity growth trends from preliminary data that include cyclical shifts is particularly hard, but the indications from the United States are that the faster rate of growth that was achieved after 1995 has been sustained since 2000. It is also possible that a further acceleration has occurred. In contrast, European productivity growth, which was slow from 1995 to 2000, seems to have slowed even more since then. Productivity is usually weak in downturns but the Center for European Policy Studies (2002) argues that productivity growth is getting weaker even after adjusting for the cycle. It is too early in the recovery to be sure, but the fact that the latest figures show such weak productivity growth in Europe is not a good sign.⁵³ (Productivity growth has been fairly weak in Britain also.)

The Diagnosis

The economic problem in Europe is a combination of low employment and a slowdown of productivity growth. The core economies in Europe could not adjust to the sharp slowdown in productivity that began in 1973. The impact of the productivity slowdown has been exacerbated by

53. The European Central Bank (2004) just released a study showing slow growth in labor productivity for the nonfarm business sector of the euro area economy—only 1.2 percent a year, 1996–2003.

a decline in the relative demand for low-skilled workers, caused by some combination of biased technological change and globalization.

The loss of employment that started as cyclical became structural over time. In part this was because average real wage growth, even though it slowed, was still faster than the rate consistent with a return to full employment. In addition, the level of income support provided to those not working was sufficient to discourage job seeking, especially by the less skilled.

The low level of employment in Europe is the result of too little demand for labor—because employer wage costs are too high—and too little supply of labor—because unemployment benefits are either too generous or structured in a way that reduces employment incentives.

Europe developed a vicious cycle where a decline in employment triggered a rise in workforce taxes to support the nonemployed, which in turn lowered work incentive. When this ratio gets too low, employment starts to decline and the cycle continues. Policymakers finally cut back benefit levels for the jobless to halt this decline, but not before employment had already fallen drastically.

Since the problem is low employment and slow productivity growth, clearly the solution is to seek policies to improve both problem areas. The path to faster productivity growth is the topic of the next two chapters.

Appendix 2.1

A Model of Employment and Productivity

Labor Demand

Labor demand is determined from the real wage and a production function:

$$Q = A\bar{K}^\alpha L_t^{1-\alpha}$$

Q is output, A is a constant, K is the fixed capital stock, L_t is hours worked in period t . Labor demand is then determined by equality between the real wage, W_t , and the marginal product of labor.

$$W_t = (1-\alpha)A\bar{K}^\alpha L_t^{-\alpha}$$

$$L_t^D = BW_t^{-\frac{1}{\alpha}} \quad (1)$$

Equation (1) gives the labor demand schedule, where B is a constant.

Labor Supply (hours worked per capita L_t^S with population assumed constant)

$$L_t^S = D(W_t(1-T_t), b_t, DEMOG_t, L_{t-1}) \quad (2)$$

where L_t^S is labor supply in time t , T_t is the tax rate on wage income, b_t is the benefit level paid to those who do not work, $DEMOG_t$ reflects the age distribution of the population, and L_{t-1} is employment in the previous period.

$$D_1 > 0, D_2 < 0, D_4 > 0$$

If there is a demographic shift, so that a greater proportion is elderly, for example, then labor supply falls, *ceteris paribus*.

Supply and Demand Equilibrium

For given values of T_t , b_t , and L_{t-1} there is a conventional supply and demand equilibrium, which is a short-run equilibrium. There is a gap between the real wage paid, W_t , and the wage received, $W_t(1-T_t)$. If $L_t^S < L_{t-1}^S$, then the labor supply moves to the left. As employment declines, the before-tax real wage rises. If the labor tax rate, T_t , were held constant, then a long-run equilibrium would ultimately be established. In the long-run equilibrium, employment remains constant.

The discussion so far, however, has ignored the issue that could create instability as described in the text. As employment falls the total cost of benefits paid to persons without jobs will rise. That aspect is now added to the model.

Benefit Determination: The Work-Incentive Ratio

$$\phi_t = \frac{W_t(1-T_t)}{b_t} \quad (3)$$

The benefit level, b_t , is assumed to be set over time by policy. The “work-incentive ratio,” ϕ_t , is then defined as the ratio of income received from working to income received by not working.

Budget Constraint

In the calculation of the model in the text, benefits paid to persons without employment are supported solely from taxes on labor income so that:

$$b_t N_t = T_t W_t L_t$$

Where N_t is the number of people not working. The population is fixed by assumption at P . So:

$$b_t(P - L_t) = T_t W_t L_t \quad (4)$$

A Special Case of Labor Supply

Take the demographic variable as a constant for the present and assume the following form for labor supply, shifting to a continuous time frame.

$$\frac{dL_t^s}{dt} = f\left(\frac{W_t(1-T_t)}{b_t}\right) = f(\phi_t) \quad (5)$$

It is assumed further that $f(\phi_t) \leq 0$, if

$$\frac{W_t(1-T_t)}{b_t} = \phi_t \leq \bar{\phi}$$

It is assumed that the work-incentive ratio must be at or above a critical level $\bar{\phi}$ in order to prevent labor supply from declining. The model will not address in detail what happens if ϕ is above $\bar{\phi}$. Presumably employment increases, but there will be a limit to this as full employment approaches. There could also be shifts in the labor supply relation, $f(\phi_t)$, as

employment falls lower and lower, but that too will not be explored. This model is an exercise to see what happens in a region around an initial employment level.

Tracing Out the Effect of a High Benefit Level

In this model, there are three equations that determine L_t , W_t , and T_t once the government has set the path for transfer benefits, b_t .

Setting the Work-Incentive Ratio Constant. One way in which instability in employment will occur was not described in the text of the chapter. If b_t is set at a level over time that keeps pace with changes in the after-tax wage rate—keeps the work-incentive ratio constant—and at a high enough level that $\phi < \bar{\phi}$, then employment will keep declining until $f(\phi_t)$ changes or the system breaks down. The possibility that benefit levels could be set in this way is not an extreme assumption. It would be the case if there were a decision to preserve the distribution of income and to maintain a minimum income level based on relative income.

The Case where the Real Benefit Level Is Held Constant. Unfortunately, the model can develop an unstable case even if the real benefit level is held constant over time. Suppose b_t is set initially so that $\phi_t < \bar{\phi}$ and then b is held constant over time. There is still a potentially unstable dynamic because as employment falls, the number of persons receiving benefits rises and this increases the tax burden and discourages employment further. But offsetting this effect is the fact that before-tax wages rise. How does this play out? The answer depends on whether ϕ rises or falls. With b fixed we have:

$$\text{sign} \frac{d\phi_t}{dt} = \text{sign} \left[(1 - T_t) \frac{dW_t}{dt} - W_t \frac{dT_t}{dt} \right] \quad (6)$$

Then from labor demand:

$$\frac{dL_t}{dt} = -\frac{1}{\alpha} B W_t^{-\left(\frac{1+\alpha}{\alpha}\right)} \frac{dW_t}{dt} \quad (7)$$

And from the budget constraint:

$$[-b - T_t W_t] \frac{dL_t}{dT_t} - T_t L_t \frac{dW_t}{dT_t} = W_t L_t \frac{dT_t}{dt} \quad (8)$$

Using the value of L implied by the employment demand equation, simplifying and using $\alpha = 1/3$ gives:

$$\text{sign} \frac{d\phi_t}{dt} = \text{sign} \frac{dW_t}{dt} \left[1 - 3 \left(\frac{b}{W_t} + T_t \right) \right] \quad (9)$$

Since the before-tax wage is rising, the sign depends on the parenthesis. With any likely combination of tax rate and ratio of benefit level to the wage, this expression implies that ϕ would fall over time. This means that setting a benefit level that is too high will not only reduce employment in the short run, but may trigger an unstable decline in employment over the longer term. The attempt to fix a benefit level that is too high leads to a gradual increase in the tax rate that triggers further employment declines and an even higher tax rate. The real wage does not rise fast enough to offset this process.

A key reason for this instability is the assumed Cobb-Douglas production function that implies a very elastic demand for labor. Rather small increases in the equilibrium real wage (which help stabilize the system) result from large declines in employment (that destabilize the system). In the specific example, a 10 percent employment decline goes with a 3.3 percent wage increase (a 3.3 percent increase in the marginal product of labor).

It is certainly possible that the true labor demand elasticity would be different—although note that it is the long-run elasticity that is relevant here. If the elasticity of labor demand is unity, equation (9) changes to:

$$\text{sign} \frac{d\phi_t}{dt} = \text{sign} \frac{dW_t}{dt} \left[1 - \left(\frac{b}{W_t} + T_t \right) \right] \quad (10)$$

Even in this case, stability is not assured. A combination of a benefit to wage ratio plus tax rate that is greater than or equal to unity will still give a continuing decline in labor supply and employment. Obviously this model is very simple, but it does raise the possibility of an unstable decline of employment over some range.⁵⁴

Variations on the Model

Capital Taxation. One possible variation on the model would be to allow some part of the benefit cost to be borne by capital taxation. That would reduce the impact of paying benefits on the work-incentive ratio. However, it is not clear that stability would be enhanced once the full effects

54. Note also that the size of the labor demand elasticity is tied to the extent to which productivity increases in an economy when wages are pushed up by institutional forces. In this chapter a reason given for high labor productivity in Europe is that low-wage jobs are eliminated. Some people have been skeptical of this argument. If they are correct, then this suggests a large labor demand elasticity and increases the likelihood of labor-market instability.

were included. Paying benefits to the nonemployed reduces labor supply and this pushes up the real wage paid by employers and reduces the return on capital. So even without explicit taxation on capital, there is a reduction in capital income as a result of the drop in employment. In fact if capital were mobile (at the limit it must earn the same risk-adjusted return everywhere), the amount of capital would decline as employment fell. In this case, the labor demand relation would become more elastic than the one used here (where the amount of capital is taken as given). Any attempt to tax capital to pay for benefits, over and above the impact of rising wages, would be met with a reduction in the amount of capital and the incidence of the capital taxation would fall largely on labor in the end.

Value-Added Taxation. Perhaps a more relevant alternative is that value-added taxes would be used to pay for benefits. This means in practice that the tax burden falls both on wage income and on benefit income. A rise in value-added taxation, to a first approximation, would reduce both the numerator and the denominator of the work-incentive ratio. This would help stability in the model, as noted above in the text of the chapter, compared to the case where benefits are paid only from payroll taxes. There is a more general point here. The adverse effects of benefits on employment in this model are the result of the particular structure of taxes and benefits assumed. If welfare and unemployment support can be restructured to have fewer adverse incentives then the negative cycle of decline outlined in this model can be avoided.

Demographic Change. As the proportion of the population that is elderly increases, this will reduce the supply of labor relative to the size of the population at any given work-incentive ratio. It will not in itself change the critical value of the work-incentive ratio, which will depend on the preferences of the potentially economically active population. However, the larger the proportion of elderly in the population receiving retirement benefits that are paid for with payroll taxes, the lower will be the work-incentive ratio. A rising burden of support for retirees increases the danger of pushing the work-incentive ratio below its critical value.

Productivity Increases. Improvements in MFP are captured in the model by increases in the A term in the production function, and these in turn will increase the term B in the labor demand relation. If $\alpha = 1/3$, then each one percentage point of MFP increase will lead to a three percentage point increase in the demand for labor at a given wage. Over time, this will result in somewhat higher wages (before- and after-tax wages) and higher employment. This result of course assumes that aggregate demand will rise fast enough to absorb the resulting increase in aggregate supply. If capital were to expand also in response to the MFP increase, then the employment effects would be larger.