Issues in the Comparison of Welfare Between Europe and the United States*

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ABSTRACT

Starting from barely half the level of productivity and per-capita income as the United States in 1950, Europe began a rapid catch-up. While Europe's level of productivity almost reached the U. S. level in 1995, its income per person never exceeded 75 percent and has since fallen below 70 percent. How could Europe be so productive yet so poor? The simple answer is that hours per person in Europe have fallen drastically in the past 40 years, reflecting long vacations, high unemployment, and low labor force participation.

How does the European shortfall in measured real GDP per capita translate into a comparison of welfare? We assess four interpretations of low hours per capita in Europe, that it represents a taste for leisure, that it results entirely from higher labor taxation, that it is a byproduct of the welfare state, and that it is not voluntarily chosen but achieved by unions and left-wing politicians eager to spread the available work through short hours and early retirement. This paper assesses these hypotheses by dividing Europe-U.S. differences in hours per capita separately into changes in hours per employee and in employees per capita, by examining unemployment and labor force participation by age, by focusing on the post-1995 turnaround in European hours per capita, and by distinguishing between the value of leisure during different periods of the week. The evidence is consistent with the view that the tax/welfare explanation does not explain everything, but it plausibly explains about half of the pre-1995 decline in Europe's hours per capita and somewhat less than half of the post-1995 turnaround.

The paper goes beyond the recent literature by providing a welfare analysis of unemployment and early retirement, and it calls attention to the ambiguity about the disutility of work implicit in time use surveys. It concludes that the welfare value of time transferred from work to unemployment or work to early retirement is very low, even if the value of reduced hours for employees is relatively high.

Finally, the paper turns from hours to real GDP itself. It considers numerous ways in which measured GDP comparisons overstate U. S. welfare, including excess energy use, prison population, metropolitan dispersion, and an inefficient medical care system. Overall, the paper concludes that the welfare gap between Europe and the U. S. in 2004 was about 55 percent of the measured income gap; that is, Europe's welfare in 2004 was about 83 percent of the U. S. in contrast to 69 percent for measured income per capita.

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I. Introduction

Starting immediately after World War II with a level of labor productivity barely half that of the United States, by the mid-1990s Europe had caught up to near parity and some nations had exceeded the American level of productivity.[1] Yet over the same period Europe's relative per-capita income did not exhibit a similar catching-up process. The ratio of European to U. S. income per capita since 1970 has stagnated at between 70 and 75 percent.

Using the data sources for this paper, explained in Part II, Europe's labor productivity level by 1995 had reached 97.5 percent of the U. S. and then by 2004 had fallen back to 89.7 percent. But per capita income in the same years was 75 and 69 percent, for a gap in 1995 of 22 percent and in 2004 of 21 percent. How is this large gap to be interpreted? How could Europe be so productive yet so poor?

At one extreme, if the decline in European hours per capita consisted entirely of voluntarily chosen long vacations that could be valued at the after-tax market wage, then the entire discrepancy would represent an undercounting of European welfare compared to the United States. This position is taken by Blanchard (2004, p. 4), who writes that "The main difference is that Europe has used some of the increase in productivity to increase leisure rather than income, while the United States has done the opposite." An alternative interpretation is that the rise in the Europe-to-U. S. productivity ratio was artificial, as Europe made labor

1. All references to "Europe" in this paper refer to the 15 members of the European Union prior to May 1, 2004, the so-called "EU-15."

expensive through high labor taxes, high minimum wages, and tight labor market regulations. As a result, firms were forced to slide northwest up their labor demand curves, retaining high productivity workers while forcing low-productivity workers into unemployment or out of the labor force entirely. Under this interpretation the decline in hours per capita is largely involuntary and does not represent unmeasured welfare.

Our interpretation of declining hours per capita assesses several much-cited contributions by macroeconomists on both sides of the Atlantic. We evaluate alternative hypotheses, starting with the much-discussed Prescott (2004) interpretation that *all* of the decline in hours per capita was caused by high labor taxes in Europe, and the more recent Ljungqvist-Sargent (2006) argument that places less emphasis on labor taxes and more on disincentive effects of welfare systems. Contrasted with Prescott and Ljungqvist-Sargent is the controversial hypothesis by Alesina, Glaeser, and Sacerdote (2006) that attributes much of the decline in hours per capita to political pressure by labor unions and left-wing political parties to reduce hours and lower the retirement age and explicitly criticizes the Prescott tax effects as being implausibly large.

We use three different dimensions of the data to help assess the plausibility of the alternative hypotheses. As the first dimension, we provide a breakdown of the sources of the decline in European hours per capita into falling hours per employee, lower labor-force participation, and a higher unemployment rate. The Blanchard hypothesis that most of declining hours represents voluntarily chosen leisure seems less plausible when the data tell us

that only one-third of the overall decline through 1995 represents lower hours per employee, and full two-thirds represents higher unemployment and lower labor-force participation. As the second dimension, we examine the pattern of EU-US differences in unemployment and labor-force participation rates by age group. The Prescott tax hypothesis applies across the board to all age groups, but the data by age show EU-US differences concentrated at particular ages. As the third dimension, we examine the turnaround in the behavior of EU employment per capita (not hours per employee) after 1995, with a shift from a declining EU/US ratio of employment to population to a rising ratio. Which variables – taxes, welfare, unions, and regulations – provide a plausible explanation of this turnaround?

We cite additional evidence relevant not to the choice between the main hypotheses, but relevant for the welfare interpretation of the decline in European hours per capita. Selected evidence shows that hours transferred from market activity to unemployment or early retirement are heavily engaged in home production, not leisure. European hours of leisure vary much less in comparison to U. S. hours than market work hours, because out-of-work Europeans cannot afford to buy restaurant meals and other market services and so spend more time than Americans in home production. Further, the high cost of labor caused by high tax rates and other disincentives directly reduces the share of employment in the European trade and services sectors.

Subsequent to the main part of the paper that analyzes hours per capita, the second aspect of the welfare comparison concerns not the interpretation of hours in Europe but rather

output, the numerator of both the Y/N and Y/H ratios. Is the translation of output to welfare different in the United States than in Europe? This part of the paper involves comparisons that are less frequently discussed. The claim that U. S. GDP is overstated for welfare comparisons begins with its harsh climate that requires higher expenditures on energy to achieve a given level of interior comfort. Another portion of U. S. GDP goes to maintaining an enormous prison system that currently incarcerates 2 million Americans, mostly for minor drug offenses. A more controversial claim is that longstanding U.S. policies have encouraged inefficient low-densities of metropolitan areas, adding to traffic congestion, commuting times, and air pollution. A final element which is both the largest and perhaps easiest to quantify is the enormous waste of resources involved in the dysfunctional American medical care system, amounting to perhaps three percent of U. S. GDP.

A final speculative section addresses the distain of Europeans for the insecurity of the American way of life. Rather than place an explicit value on greater security in Europe than in America, we assume that high taxes in Europe buy something of value, that is the social welfare system, and accordingly our point of departure for all comparisons in this paper is before-tax income per capita rather than after-tax income per capita.

Plan of the Paper

The paper begins in Part II by comparing productivity and per-capita income in Europe and the United States. The difference between the Europe-to-U.S. productivity and per-capita-income ratios is by definition the ratio of hours per capita, and this is then decomposed into its

three main components – hours per employee, the employment rate, and the labor-force participation rate (LFPR). In Part III we examine the age distribution of differences between Europe and the U. S. in unemployment and labor-force participation rates to establish facts needed to distinguish hypotheses. Then Part IV reviews and criticizes the alternative explanations introduced above, namely voluntarily chosen leisure, political mechanisms, high labor taxes, and high social benefits. We also examine the plausibility of these explanations for the turnaround in the EU/U. S. ratio of employment to population after 1995.

Part V goes beyond the recent literature to discuss issues implicit in the translation of differences in hours to differences in leisure. We provide an analysis of the welfare cost of higher unemployment that distinguishes between temporary recessions and permanent changes in the natural rate of unemployment and argues that, at least for adult men, the welfare value of daytime weekday hours switched from work to unemployment is very low. We provide a numerical example to think through the welfare implications of early retirement. And we discuss recent evidence from time-use surveys showing that there is no sharp dichotomy between hours of work and hours of leisure, and in fact work is considered more "enjoyable" than many types of leisure and household production.

Then Part VI turns from hours to the translation between GDP and welfare. We examine a wide range of issues including energy use, prison incarceration, urban density, and public transit. To what extent does a comparison of American and European welfare depend on subjective tastes on each side of the Atlantic for the various attributes of high or low urban

density? And how much of U. S. GDP could plausibly be attributed to the inefficiency of its medical care system, which spends a much larger share of GDP than other countries without any identifiable product in terms of better medical care outputs or inputs. Part VII concludes with a summary that puts together the separate conclusions about hours and GDP. We find that measured real GDP per capita understates European welfare relative to the U. S. by about 44 percent of the EU/U.S. gap and explains about two-thirds of the gap between the EU/U. S. ratio of productivity and income per capita.

II. The Evidence: Productivity Converges but Per-capita Income Does Not

In this section we examine the basic data on output per capita and output per hour and then subsequently turn to the explanations.[2] The data on both labor productivity (Y/H) and real GDP per capita (Y/N) come from the invaluable Groningen data bank, which provides inter-country comparisons with two base years and weighting schemes.[3] Averaging these two data sources, we find that Europe's (EU-15) productivity level by 1995 had reached 97.5 percent of the U. S. and then by 2004 fell back to 89.7 percent. Three European countries had exceeded the U. S. level – France was at 117.3 percent in 1995 and 113.2 percent in 2004; Belgium was at

3. As indicated before, all data on GDP, population, and hours come from the Groningen economy-wide data base, which has assembled data for many countries going back to 1950.

2. These are the "G-K" (Geary-Khamis) weights calculated in 1990 dollars and the "E-K-S" (Eltetö, Köves, and Szulc) weights calculated in 2002 dollars. For a year like 1980, the average of the G-K and E-K-S data show that the Europe/U.S. ratio of per-capita income is 74.4 percent, almost identical to Neary's (2004) preferred "QUAIDS" index number method that yields 74.3 percent. All data on productivity, income per capita, and hours per capita come from the Groningen economywide data base http://www.ggdc.net/index-dseries.html.

113.2 percent in 1995 and 106.5 percent in 2004; the Netherlands was at 116.4 percent in 1995 and fell back to 98.9 percent in 2004.

But none of these countries had come close to catching up with the level of U. S. real GDP per capita. In the 1995-2004 period, averaging the same two data sources, France achieved no better than 77.5 percent of the U. S. level in 1995 and this ratio had fallen back to 73.4 percent by 2004. Thus the Y/N ratio for France was fully 40 points below its Y/H ratio in 1995 and a similar 40 points in 2004. By definition, this discrepancy is due to a precipitous decline in hours per capita in France relative to the U. S. over the past four decades. For the EU-15 the same discrepancy in 2004 was 20 percentage points, with a productivity ratio to the U. S. of 89 percent and an income-per-capita ratio of 69 percent.

To allow for the initial stage of rapid postwar reconstruction in Europe, each of our graphs begins in 1960 rather than 1950. Figure 1 displays real GDP per capita for the EU-15 as compared to the United States, and the log scale shows how remarkably constant has been the gap between the two series since about 1970, after a period of European catch-up prior to 1970. Despite the widespread impression that Europe continued to catch up after 1970, the annual growth rate of real income per capita for the U. S. from 1970 to 2004 was 2.05 percent, slightly ahead of the European growth rate of 1.97 percent. Consequently, the ratio of European to U. S. per-capita output retreated slightly from 71.2 percent in 1970 to 69.2 percent in 2004.

Figure 2 provides the dramatically different comparison of real GDP per hour, i.e., labor

productivity, in Europe as compared to the United States. Continuing its rapid productivity growth of 1960-70, Europe continued to catch up until 1995, reaching a ratio of 97.4 percent. The growth rate of labor productivity in Europe from 1970 to 1995 was a robust 2.77 percent per year, almost double the United States rate of 1.43 percent per year. This relationship was completely reversed after 1995, with the European rate falling to 1.53 percent per year, almost a full percentage point behind the U. S. rate of 2.46 percent per year.

An examination of the percentage per-capita income *(Y/N)* and productivity *(Y/H)* ratios of Europe to the U. S. reveals a dramatic contrast in the timing and magnitude of changes of these ratios, and this is displayed in Figure 3. The productivity ratio rises steeply until 1995, holds at a plateau near 100 percent until 2000, and then enters into a decline during 2001-2004. In contrast the per-capita income ratio first reaches 70 percent in 1970 and then fluctuates in a narrow range between 71 and 76 percent until 2004, when it falls back below 70 percent. The 1982 peak in this ratio is artificial, as it reflects the U. S. recession of that year rather than progress for Europe.

Decomposition of the Decline in Europe/U. S. Hours per Capita

By definition, real output *(Y)*, population *(N)*, hours of work *(H)*, and employment *(E)*, are related as:

$$Y/N \equiv Y/H * H/E * E/N \quad \textbf{(1)}$$

which states that output per capita equals labor productivity times annual hours per employee, times employment per capita. Subsequently we will further subdivide changes in the *E/N* ratio into its two components, the employment rate *(E/L)* and the labor force participation rate *(L/N).*

$$E/N \equiv E/L * L/N = (1-U/L) * L/N, \quad \textbf{(2)}$$

where *U/L* is the unemployment rate.

In Figure 4 the dashed grey line is the ratio of the two lines in Figure 3, namely the Europe/U. S. ratio of output per capita divided by the Europe/U. S. ratio of output per hour. By definition, the dashed grey line equals hours per capita and is labeled as such in Figure 4. This shows a decline from 120 percent in 1960 to 102 percent in 1970 to 74 percent in 1995 and then a slight recovery to 77 percent in 2004.

By definition any changes in hours per capita (H/N) must be explained by changes in the same direction in the product of the hours/employee and employment/population ratios, as shown in Figure 4 by the solid grey and solid black lines, respectively. An important finding is that the decline in the hours per capita ratio has been explained more by the decline in the employee to population ratio than by the hours to employee ratio. Thus we can reject Blanchard's (2004) overly facile explanation, as quoted above, that the differential behavior of European productivity to European per-capita income is simply a matter of the voluntary choice of shorter hours. Also, we note two interesting aspects of timing that may help to distinguish alternative hypotheses. First, much of the decline in the employee-population ratio

had already occurred by 1970, whereas the decline in the ratio for hours per employee was more gradual. Second, there was a distinct turnaround in the employee-population ratio after 1995 but not in the hours-employee ratio.

The time-series plots of the three ratios in Figure 4 are summarized in Table 1, which displays both levels and growth rates for 1960, 1970, 1995, and 2004. Starting in the first column with hours per capita, we find a steady decrease at an annual rate of -1.6 percent for 1960-70 and -1.3 percent for 1970-95, followed by a turnaround to a positive growth rate of 0.5 percent for 1995-2004. Hours per employee also declined relatively steadily from 1960 to 1995, with respective 1960-70 and 1970-95 growth rates of -0.5 and -0.4 percent, and this decline continued after 1995 at an annual growth rate of -0.2 percent. The "residual," employment per capita, declined steadily in 1960-70 and 1970-95 at respective growth rates of -0.9 and -0.8 percent, followed by a sharp turnaround after 1995 to +0.8 percent. This turnaround in the behavior of employment per capita may be helpful in assessing alternative hypotheses to explain Europe's low hours per capita.

The Time Series of Hours per Employee and the Employment-Population Ratio

The Europe/U. S. ratios corresponding to equation (1) above are quite revealing in the magnitude and timing of the changes. However, we can gain additional insights by looking at the raw numbers for Europe and the U. S. separately. As shown in Figure 5, hours per employee in 1960 were higher in Europe, 2082 hours per year compared to 2033 hours in the United States. From 1960 to 1975 hours in Europe declined slightly faster than in the U. S., in

1975 reaching 1827 for Europe and 1878 for the U. S. After 1975 there was a sharp divergence, so that by 2004 hours in the U. S. had barely declined, from 1878 to 1817, whereas the decline in Europe was much more significant, from 1827 to 1552. Those like Prescott (2004) who attribute the entire decline in hours to high European labor taxes need to show that these taxes increased in Europe relative to the U. S. steadily throughout the post-1960 period and particularly between 1975 and 1990.

Perhaps the most interesting of our comparison charts is Figure 6, which shows the employment-population ratio in Europe and the U. S. separately. In the United States, we take for granted the increase in this ratio that occurred between 1965 and 1985 due to the entry of females into the labor force. Over the period plotted in Figure 6 the U. S. ratio increased from 35.8 percent in 1963 to 47.5 percent in 1990 and then flattened out to an identical 47.5 percent in 2004. In contrast, the European ratio actually fell from 42.2 percent in 1960 to 39.3 percent in 1983, followed by a small recovery to 40.3 percent in 1994 and then a substantial revival to 43.6 percent in 2004.

Why did the entry of females into the labor force in Europe not generate the same rise in the employment-population ratio in Europe as in the U. S. in the 1965-1985 period? This puzzle is partly explained by the sharp increase in European unemployment that occurred over the same time interval; an increase in the unemployment rate reduces the ratio of employment to the labor force, apparently by enough to offset the role of females who would have been expected to increase the labor force participation rate. Another possibility is that a trend to

earlier retirement ages pushed down the labor force participation rate by enough to offset the increase in the female labor force participation rate. It is worth noting that fertility rates in the United States are substantially higher than in Europe, implying that more European women have time free from raising children and would thus be expected to have a higher labor force participation rate than in the United States.

III. Interpreting Changes in Hours per Capita

Until now we have examined time-series changes in the key components of hours per capita in Europe vs. the United States. The pattern of changes over time may be more consistent with some types of explanations than others, helping us to discriminate among them. Age is another dimension that may help us with this discrimination, for instance, an explanation for falling hours per capita in Europe based on higher labor taxes would tend to impact workers of all ages up to retirement age rather than have a disproportionate effect on one age group or another.

The Age Distribution of Unemployment and Labor-Force Participation

Unemployment rates by five-year age groups are shown for the EU-15 and United States in Figure 7. The unemployment rate is uniformly higher across all age groups.[4] These differences can be assessed using absolute or relative differences. For teenagers the European rate is 22.0 percent vs. 13.9 for the U. S., an absolute gap of 8.1 points and a relative gap that is

59 percent of the U. S. rate. The lowest absolute gap is for age group 45-49, where the European rate is 6.0 and the U. S. rate is 2.8, for an absolute gap of 3.2 points and a relative gap of 114 percent. Because the absolute and relative differences occur for all age groups, this evidence would seem to endorse a single explanation such as high labor taxes.

However, as shown in Figure 8 the behavior of the labor-force participation rate (LFPR) is quite different. For the prime-age groups from 30 to 44 the rates in Europe are identical to the United States. The big differences are for the young and particularly for the older age groups. The absolute shortfall for Europe is 11.7 points for age 15-19, 10.7 points for age 20-24, 12.1 points for age 55-59, and a huge 22.8 points for age 60-64. These differences do not seem consistent with Prescott's (2004) labor tax explanation and may be more compatible with the Alesina *et. Al.* (2006) emphasis on the political process which may have included pressure for pension schemes that encourage early retirement. The low participation for the older groups in Europe may also be compatible with the Ljundqvist-Sargent (2006) preference for an explanation based on European social welfare policies rather than labor tax rates.

By definition, the employment rate *(E/L)* times the LFPR *(L/N)* equals the employment-population ratio *(E/N)*, for which we have already examined time-series changes in Figure 4 and Table 1. Figure 9 shows the employment-population ratio by age group, and this combines the age pattern of unemployment in Figure 7 and of the LFPR in Figure 8. Because unemployment is higher at every age group in Europe, the prime-age groups that in Figure 8 have the same

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4. Our OECD data source does not provide rates for European age groups above 65. In Figure 7 these are

LFPR as in the U. S. also have lower *E/N* ratios in Figure 9. But the overall pattern is the same, with larger absolute and relative differences for the youngest and oldest age groups.

The aggregation of the group-specific unemployment rate and the LFPR depend on the relative size of each group. As shown in Figure 10, Europe's population structure is more heavily weighted to the older age groups, as would be expected with lower fertility, higher life expectancy, and a smaller flow of immigration. All the European age groups starting with age 50-54 have a higher weight than in the U. S., and all younger age groups have a higher weight in the U. S. except for age groups 25-34.

Summary of Findings on Changes in Hours per Capita

Changes in hours per capita in Europe compared to the U. S. can be divided into two categories – changes in hours per employee *(H/E)* and in employment per capita *(E/N)*, and the latter can be further subdivided into changes in the employment rate *(E/L)* and changes in the labor force participation rate *(L/N)*. We have learned from Figure 4 and Table 1 that the post-1960 period can be divided into two distinct phases split at 1995. Between 1960 and 1995, fully two-thirds of the decline in hours per capita was accounted for by the employment ratio *(E/N)* and only one-third by hours per employee *(H/E)*. This provides useful dose of skepticism for Blanchard's previously cited view that Europeans used their high productivity to purchase more leisure; leisure in the form of shorter hours per employee were only one-third of the story through 1995.

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assumed to have the same ratio to the United States as in the 60-64 age group.

Fully two-thirds of the decline in hours per capita occurred because of higher unemployment and lower labor force participation, hardly an outcome of voluntary choice. But an additional dimension of evidence in Table 1 is that the Europe-to-U.S. ratio for employment per capita *(E/N)* turned around after 1995 while the hours per employee ratio, while declining more slowly, did not turn around. All this suggests that a different set of factors may have been driving changes in the hours ratio from the employment per capita ratio.

While we do not have graphs on the time series behavior of the split of the employment ratio between the unemployment rate and the labor force participation rate, we can calculate the importance of each of these components for a single year, 2002. Using U. S. population weights as in Figure 10 to aggregate across age groups, with EU unemployment and LFPR's the Europe/U. S. employment ratio *(E/N)* would have been 86.2 percent. Continuing with U. S. population weights, with U. S. age-specific unemployment rates that *E/N* ratio would have risen to 90.8 percent, and obviously to 100.0 percent with U. S. age-specific unemployment rates and labor-force participation rates. Thus we conclude that in 2002, of the gap of 13.8 percent between the European and U. S. *E/N* ratio, less than one-third (4.4/13.8) is explained by higher European age-specific unemployment rates and more than two-thirds (9.2/13.8) by lower European age-specific labor force participation rates.

IV. Alternative Hypotheses to Explain Declining Hours per Capita

In recent journal and conference discussions most of the attention has focused on single-

cause explanations of the secular decline in hours per capita in Europe, such as Prescott's labor taxes or Alesina's politically powerful unions. However, our examination of the data suggests that a multi-cause nuanced set of explanations might better fit the facts, including the post-1995 turnaround in the Europe/U. S. employment per capita *(E/N)* ratio and the sharp differences in the Europe/U. S. ratios of labor force participation by age group.

As we discuss and criticize the alternative hypotheses, we should focus on welfare implications of the extra hours of the year spent by Europeans in non-market work instead of market work. Conventional economic analysis values leisure at the marginal after-tax wage. If a single cause like higher labor taxes causes a substitution from work to leisure, the value of the extra leisure consumed would be measured by the area under the labor supply curve in a diagram like Figure 11. Since Prescott's approach to the analysis of labor taxes assume that there is no income effect, because tax revenues are rebated to the population through government expenditures and transfers, the effect of taxes is to create a pure substitution effect. If we imagine an upward sloping labor supply curve extending between the 2004 European *H/E* annual total in of 1550 hours and the U. S. ratio of 1811 hours, then presumably the average value of the extra leisure in Europe is halfway between the marginal after-tax wage that Europeans receive today and the higher marginal after-tax wage that Europeans would receive in a hypothetical world in which taxes are levied at American rates. A basic question, however, is whether this valuation of leisure should be applied to the entire reduction in hours per capita that includes the effects of higher unemployment and lower labor force participation rates, or

only to the one-third of the drop in European hours per capita consisting of lower hours per employee, i.e., vacations and shorter work weeks.

Prescott on Labor Taxes

The Prescott (2004) explanation claims that the entire difference between Europe and the U. S. not just for hours per employee but for hours per capita can be explained by higher tax rates on labor. The key to this demonstration, as explained by Alesina *et. Al.* (2006, p. 13), is that Prescott chooses a functional form that delivers a very high elasticity of labor supply, that is, a response of around -0.8 in logs to *1/(1-t),* where *t* is the tax rate on labor income. Alesina and co-authors show that the data require an even higher elasticity of -0.92, which is the ratio of the -29.7 percent log difference between European and American hours, divided by the 32.4 percent log difference in the marginal tax rate expressed as *1/(1-t).* They reject the Prescott assumptions after reviewing the micro labor supply literature that shows uncompensated labor supply elasticities for men that are close to zero. While labor supply elasticities for married women are high enough so that European tax rates could explain the entire Europe-U.S. difference for women, averaging the zero response for men and the large response for women leads the authors to conclude that tax rate differences can explain at best one-half of the hours per capita difference.

A further weakness in the Prescott argument comes from the times series evidence. Most of the increase in tax rates occurred between the 1960s and mid-1980s, whereas the decline in hours continued at least through 1995. As we have noted, after 1995 the decline in hours per

employee continued at a slower rate whereas the decline in employees per capita turned around into an increase. A final problem is that high tax rates may be standing as a proxy for a whole range of variables that differ between Europe and the U. S. but are not included explicitly in the simplistic cross-country correlations between tax rates and hours per capita, namely "generous welfare systems, workplace regulations, unemployment compensation programs, powerful unions, generous social security systems, etc." (Alesina *et. Al.,* 2006).

The Welfare State

Some critics, particularly Ljungqvist and Sargent (2006), criticize Prescott's assumption that labor taxes are entirely redistributed to households as lump-sum transfers that are valued as if they were privately purchased goods and services. It is this device that allows Prescott to ignore income effects, and in turn to overstate the portion of changing work hours attributable to changing tax rates. These authors also criticize Prescott for ignoring the fact that in the early 1970s tax rates in France and Germany were already 10 points higher than in the U. S. but hours per capita were basically the same, as shown above in Figure 4.

Ljungqvist and Sargent (2006, pp. 43-44) emphasize the different welfare implications of the "national family perspective" implicit for Prescott, in which the entire population is viewed as a set of representative agents. When higher taxes reduce labor force participation, there are voluntary transfers between working and non-working members of the "national family." In reality, however, most nonemployed heads of households in Europe are not supported by voluntary intra-family transfers but rather by welfare systems that not only support reduced

hours per capita but also "strain social insurance systems and government finances."

These authors argue that reforming European welfare systems would raise hours per capita more than cutting labor tax rates. They support their view in part by pointing to the fact that Europeans worked as much as Americans in the early 1970s despite higher labor tax rates, because Prescott's hypothetical costless lump-sum redistribution within the national family was not in fact available. "Tax revenues were funneled to public goods and government expenditures that were poor substitutes for private consumption. The negative income effect of taxation worked in favor of sustaining high employment in the European welfare states" (Ljungqvist-Sargent, 2006, p. 45).

An additional consequence of generous welfare benefits is to encourage workers to remain unemployed for long periods of time after negative demand or productivity shocks. With heterogenous workers who have previously accumulated skills, there will be a loss of those skills over prolonged spells of unemployment. The skill set of workers will no longer be high enough to warrant their high reservation wage, and they "become discouraged and are likely to fall into long-term unemployment or end up in other government programs, such as disability insurance and early retirement" (Ljungqvist, 2006, p. 75).

Unionization and Regulation

Alesina and co-authors make much of the higher penetration of unions in Europe than in the United States. As is well known, unions in the United States had a negligible role prior to the 1930s, were legitimized by New Deal legislation, reached their peak of influence in the 1940s

and 1950s and began to decline in importance from the late 1960s. Some authors, including Goldin and Margo (1992) have stressed the role of unions in helping achieve the "great moderation" of income equality during their strong period. More recently Dew-Becker and Gordon (2005), among others, have emphasized the role of the reversal of union penetration in helping to explain the downward pressure on wages in the bottom 50 percent of the income distribution and the corollary, that the share of the top 10 percent has increased substantially relative to the bottom 50 percent.

In contrast, "union strength reached a peak in most European countries in the late 1970s and early 1980s" (Alesina *et. Al.*, 2006, p. 29). These authors trace two channels between high unionization and lower hours. First, unions keep wages artificially high and thus restrict employment, and in this sense on labor demand is just like a labor tax. Second, unions may pursue a political agenda to reduce work hours per employee in order to force firms to hire more unionized workers to achieve the assumed fixed total of aggregate work hours. They derive several propositions from a simple model, (1) that regulations limiting work hours will decrease productivity per worker but will raise productivity per hour, (2) that total hours worked under unionization will be lower and productivity per hour will be higher, and (3) that unions impede the reallocation of labor in response to sectoral shocks and can cause a decrease in overall hours worked, in comparison to an increase in hours worked in response to sectoral shocks in a competitive economy.

The authors support their emphasis on unions by displaying a negative correlation

between union coverage and hours of work that they claim is at least as high as between marginal tax rates and hours of work.[5] However, this kind of cross-section evidence is fragile, both because of the large size of the outliers, and also because there is no attempt to model the time-series properties of unionization vs. the pattern of European hours per capita. Neither the Alesina *et. Al.* (2006) paper nor the comments by its discussants recognize the sharp turnaround in the Europe/US employment-population ratio after 1995. This turnaround provides an opportunity to weigh the explanatory power of alternative hypotheses. Overall, the authors' analysis provides little insight beyond the general idea that unions push the labor market northwest along the labor demand curve, thus reducing hours per capita and raising the marginal and average product of labor.

Alesina *et. Al.* (2006) go beyond a simplistic reliance on union density to provide numerous examples in individual European countries in which unions promoted policies like "work less, work all" which reflected the belief that an enforcement of regulations that reduced work hours would create more jobs. Since this political pressure required that wages per job remain fixed, it forced upwards the wage per hour and pushed hours per capita lower than otherwise. Examples are given for France, Germany, and Italy of union political involvement not only in shortening work hours without pay reductions, but also in "promoting and defending the welfare state in general and public pension systems in particular" (Alesina and Glaeser, 2004). They cite not only the push for early retirement but also the role of unions in

5. This comparison is not appropriate, because the measure of hours in the tax correlation is *H*/*N* but is

negotiating early retirement schemes for older workers in cases where the closing of a large plant might otherwise cause unemployment. They attribute the concern of unions with early retirement to the political power of older workers within the union hierarchy itself.

We have already seen that perhaps the most important single source in Europe's reduction in hours per capita relative to the U. S. is early retirement, as shown by the age-specific labor-force participation rates in Figure 8. Thus a key difference between the leading authors is that Blanchard implicitly assumes that early retirement has been voluntary, Prescott assumes that early retirement is an endogenous response to high labor taxes, and Alesina *et. Al.* regard early retirement as the outcome of a political process led by unions who were involved in a political philosophy of work sharing regardless of whether workers actually want to stop working and live off pension income. Below we provide an example of the enormous cost to any society of early retirement.

Empirical Evidence on the Tax Hypothesis

Prescott's focus on taxation as the only cause of low European hours per capita relies on a model with parameters that are assumed rather than estimated. A more convincing demonstration of the importance of tax effects is provided by Davis-Henrekson (hereafter D-H, 2004, pp. 37-38) who find a multidimensional tax impact:

> Higher tax rates on labor income and consumption expenditures lead to less work time in the market sector, more work time in the household sector, a bigger underground economy, and smaller value added and employment shares in industries that rely heavily on low wage, low skill labor inputs.

H/E in the union correlation.

The D-H empirical work extends only to 1995 and thus has nothing to say about the post-1995 turnaround in European hours per capita. Regressions are run across countries for four years (1977, 1983, 1990, 1995) in which the dependent variable is alternatively the H/N, H/E, or E/N ratio, and the explanatory value is the sum of the employer labor tax rate, employee income tax rate, and indirect tax rate on consumption. In contrast to Prescott's assumed elasticity of -0.92 on the H/N ratio (as discussed above), the D-H estimated elasticity for 1995 is -0.47.[6] Thus the D-H paper arrives at the same conclusion as Alesina *et. Al.* reached by a different route, that Prescott overstates the tax effect by a factor of roughly two.[7]

An important point discussed by D-H relates to the emphasis by Ljundqvist-Sargent (2006) on effects of the welfare state. D-H admit that their tax elasticities do not reflect simply the impact of taxes, but also the disincentive effects of the welfare state on hours per capita, due to the fact that taxes are used primarily to finance the welfare state so that countries with high taxes also have high levels of welfare support. Finally, D-H cite the work of Olovsson (2004) showing that higher taxes shift work from the marketplace to home production, and this leads to large reductions in market work time with much smaller reductions in total work time as the time devoted to home production increases. This is consistent, albeit more extreme, than the empirical results of Freeman-Schettkat (2005) cited below.

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6. This can be calculated as a response of H/N of 122 fewer hours divided by a 1995 total of 1067 hours per adult, to a change in the combined tax rate of 12.8 percentage points on a base of 53.7 points in 1995. See Davis-Henrekson (2004), p. 38 for the changes and Table 1 for the 1995 base values.

Another study of tax effects by Warren and Worthington (2004) is limited only to changes in hours per employee, not hours per capita, and thus misses the bulk of the reduction in European H/N which takes the form of lower E/N. The results are hard to interpret, because the authors include both an income tax variable and a separate "tax wedge" variable which includes the income tax. Nevertheless, a rough guess from the author's reported results is that the elasticity of hours per employee to an increase in both the income tax and in the tax wedge is roughly -0.25, and this is consistent with a further -0.25 effect coming from the tax effect on the employment-population (E/N) ratio.

Further Evaluation

One line of criticism of the Alesina emphasis on unions is that the timing is wrong. As shown by Rogerson (2006, p. 83), union density averaged over 19 European countries rose through the late 1970s and fell until 1995, reaching a level that was little different than the starting value of 1960. If unions became strong and then became weak, why was their political influence still strong enough to explain low European hours per capita in 2004? Rogerson supports his skepticism by showing that union density and a measure of employment protection have very little explanatory power for changes in European hours per capita. This criticism falls into the trap of simple correlation and ignores inertia in the political process. It is possible that Europe could still be suffering from legislation that unions successfully pushed

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7. There are further issues in the D-H results that are beyond the scope of the current paper. They use two different sources of tax data, from Schneider and Nickell-Ninciata, and find that the tax results are much stronger with the former data set.

when they were strong in the 1980s but which opposing political forces have thus far been unable to overturn. The demonstrations in Paris in April, 2006, against modest reforms in labor market regulations suggest the power of such political inertia.

None of the explanations reviewed from the recent literature has any explanation of the post-1995 reversal in the ratio of the Europe/U. S. employment to population *(E/N)* ratio. Most observers are startled to find that employment has grown faster relative to population in Europe than in the U. S., where hours of work in 2006:Q1 were still 2.0 percent below their peak levels in 2000:Q1.[8] There is a chicken and egg aspect to this phenomenon of growing work hours in Europe and shrinking work hours in the U. S. over the past half-decade. Is the phenomenon to be explained an autonomous shift in the incentives for work hours in Europe vs. the U. S., as is implicitly assumed by most of the literature reviewed above, or is the behavior of work hours a byproduct of differences in productivity growth in Europe compared to the U. S. that emerge from a totally different set of factors? For instance, the productivity literature shows that fully half of the difference in U. S. compared to European productivity growth since 1995 occurred in retail trade, and this is in turn attributed to land use and other regulations which have made it much easier in the U. S. to develop "big box" retailing by firms such as Wal-Mart, Target, Home Depot, Best Buy, and others. Simple single-cause explanations of falling hours in Europe, such as "higher taxes," "welfare state," and "unions" appear to have missed completely the post-1995 turnaround and the related chicken-egg question.

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8. See www.bls.gov, productivity and cost quarterly database.

The literature reviewed here revolves around much more complex issues than Blanchard's (2004) sanguine view, quoted above, that Europeans have voluntarily chosen more leisure. Any suggestion that Europeans have a different "taste for leisure" than Americans ignores the fact that Europeans worked longer hours than Americans during the 1945-73 era of postwar reconstruction, so their passion for long vacations and short weekly hours of work is a recently acquired taste.

The Alesina approach questions whether Europeans really have chosen such long vacations voluntarily; could this outcome be the result of union or parliamentary politics? American workers seem happy to be bribed to work long hours for premium overtime pay; as the quip goes, "Compulsory overtime is an unmitigated evil that every one of my workers wants his fair share of."[9]

V. Welfare Implications of the Decline in Hours per Capita

Why does it matter whether the decline in the Europe/U. S. ratio of hours per capita is mainly caused by higher labor taxes, by the welfare state, or political pressure engineered by unions? In each case the decline in European hours per capita is involuntary, in contrast to Blanchard's interpretation that Europeans value leisure more than Americans. The Prescott tax story has Europeans pushed northwest along the labor demand curve, voluntarily choosing to reduce labor hours subject to the constraint of a large tax wedge between before-tax and after-

9. I owe the quip to Robert M. Solow, a discussant of an earlier version of this paper.

tax labor income. Prescott's interpretation includes the assumption that the high taxes buy high welfare benefits that are valued by citizens as much as the same monetary value of market consumption, thus eliminating any impact of the income effect and making the labor response into a voluntary movement up or down the labor supply curve.

The Ljundqvist-Sargent welfare state and Alesina political explanations imply that European households are not receiving leisure that they value as highly as in the standard economics textbook analysis. Ljundqvist-Sargent (2006) claim that the high labor taxes in Europe buy welfare benefits that are valued less than the equivalent monetary value of market consumption. Alesina assumes that unions and left-wing political parties push the labor market equilibrium away from that which would have been voluntarily chosen.

We can provide additional insight by looking more closely at the nuances of how those spending time in unemployment, home production, and early retirement, value leisure. How valuable is the leisure that Europeans gain from their shorter working hours due to higher unemployment and lower labor-force participations?

The Welfare Cost of Higher Unemployment

An elementary textbook analysis would value hours spent in unemployment just as in any other kind of leisure by multiplying each hour by the after-tax real wage. This overstates the value of unemployed time by ignoring the slope of the labor supply function. Only the marginal hour of leisure is worth the after-tax real wage; each additional hour of leisure (each hour less of work) is valued at less than the after-tax real wage. If the normal work week is 40

hours, 80 hours are spent in leisure (ignoring for now home production), and the remainder in sleep, then reducing work to 20 hours and raising leisure to 100 hours adds extra hours of leisure that are valued less than the after-tax real wage, due to the diminishing marginal value of leisure. In parallel the 60th hour of leisure is worth more than the 80th, which is why workers receive premia for working overtime.

Gordon's (1973) analysis of the welfare cost of higher unemployment begins with the fundamental distinction between a temporary increase in unemployment caused by a short recession that pushes the actual unemployment rate above the natural rate of unemployment, as contrasted with a permanent increase in unemployment caused by a higher natural rate of unemployment. Europe's transition from 2 percent unemployment before 1973 to 9 or 10 percent in the 1990s represents a permanent shift. Nevertheless it is interesting briefly to review the temporary case, where Gordon includes the welfare costs associated with temporary recessions that cause large welfare losses beyond the time use of the workers who shift from work to officially defined unemployment. These include the value of the lost work hours of those who leave the labor force and of those who work a shorter work week, as well as the value of the lower productivity of the remaining work hours. Lost hours and productivity are valued not at the after-tax real wage but at private output per hour, because society loses all the output produced by the lost hours, including that which would otherwise go to indirect taxes, capital taxes, after-tax income to capital, and taxes on labor income. Society also loses the extra unemployment compensation that is paid to the unemployed.

Consider the valuation of the time spent in search or at home by the unemployed. Gordon places a value on this time that for adult males is only about one-tenth private output per hour, with a higher fraction for females and teenagers. Part of the argument is that the estimated labor supply curve for adult males is nearly vertical, implying a zero value of leisure for those hours that are normally spent at work. A related argument, based on a survey of blue-collar workers, relates to a question regarding a hypothetical government payment. Would these workers require a government payment higher or lower than their present wage to stay at home rather than working? Seventy-five percent of the males responded that they would require a higher payment, 25 percent "the same," and nobody said "less." This reverses the normal textbook analysis that assumes that leisure raises utility and work reduces it, at least for adult males during the hours of the normal work week. Overall, a one percent temporary increase in the unemployment rate is associated with a 2.7 percent decline in market output when no value is imputed to nonmarket activity of those who shift from work to home activity, and this is reduced only from 2.7 to 2.3 when an appropriate price is applied to nonmarket activity (Gordon, 1973, pp. 162-4).

The welfare effects of a permanent one percent increase in the unemployment rate are less than in the temporary case, largely because the procyclical movements of hours per employee and of productivity are absent. The reduction in labor input is assumed to be accompanied by a long-run equiproportionate reduction in capital input, leaving the capital-labor ratio unchanged. However, in the permanent case the welfare analysis of the time value

of unemployment for adult males remains the same, and there is only a minor offset of lost output by the value of leisure time. Gordon's value of lost output associated with a permanent one percentage point increase in unemployment is 0.7 percent, as contrasted with 2.3 percent for the temporary case.

Early Retirement and the Valuation of Leisure

Perhaps the most convincing aspect of the Alesina approach is the interplay between the political process and early retirement in Europe. If individual households in a welfare state are given the option of a defined benefit government-funded pension plan that allows them to retire at nearly full pay at age 58, they would be crazy to turn down the option of receiving the same income for not working as they would receive for working. The costs of early retirement to society can be illustrated by a simple example.

Consider an economy that initially has people work from ages 20 to 65 and then retire from ages 65 to an assumed age of death of 84. There is no private saving. A 30 percent tax finances pay-as-you-go pensions with a balanced government budget. This tax finances a level of consumption during the 20 years of retirement equal to consumption during the 45 years of work. Now let the politicians reduce the retirement age from 65 to 55. Instead of 45 years of work financing 20 years of retirement, now 35 years of work finances 30 years of retirement. The tax rate must increase from 30 to 45.6 percent. Even ignoring the Prescott-like withdrawal of work hours by people of working age that reduces market GDP, there is a 25.1 percent decline in consumption during both work years and retirement years.

With a few additional assumptions, we can translate this decline in market consumption into a welfare measure. Let us ignore for this purpose the Gordon (1973) argument that adult males place little value on leisure time during the normal work week; shifting to his assumptions would strengthen the argument of this section that the leisure value of early retirement is a minimal offset to the lost market consumption caused by early retirement. Let us assume instead that hours that are normally spent by current workers in leisure-time activities, i.e., on weekday evenings and on weekends, are valued at 4/3 of the after-tax market wage, but that hours switched from work to weekday leisure as a result of early retirement are valued at 2/3 of the after-tax market wage. Total welfare is market consumption plus the total value of leisure. The early retirees continue to enjoy high-valued weekday evening and weekend leisure but switch from market consumption to low-valued weekday daytime leisure. A simple simulation shows that as a result of the decline in market consumption of 25.1 percent determined above, total welfare declines by 22.6 percent and the value of extra leisure as a result of early retirement offsets only 10 percent of the loss of market consumption that results from early retirement.

The time-study research by Freeman and Schettkat (2005) provides another qualification regarding the value of leisure time gained by those who are not working. They contrast the United States with Germany and find that part of the difference in hours per capita does not represent more leisure in Germany but more household production. German mothers cook more at home, American mothers more frequently go out to eat as they spend their higher

market income on market consumption. Higher labor force participation in the U. S. brings not only the benefits of higher market incomes which allow the substitution of restaurants and hired help for household drudgery but also provides for greater socialization as people remain in an organized social context during the workday in contrast to loneliness at home.

As interpreted by Mees (2006), Europe has fallen into a "leisure trap" in which both the best educated and least educated women are out of the workplace. The Freeman-Schettkat evidence fits nicely with the D-H result showing that a substantially smaller share of work hours and GDP in Europe occurs in the trade and service sectors. As Mees interprets the transatlantic divide:

> Instead of performing these household jobs themselves, Americans pay other people to do them. Americans eat more often in restaurants, make ample use of laundry, dry-cleaning and shopping services, and hire nannies to take care of young infants. Indeed, in the U. S., one finds all kinds of personal services that do not exist on a similar scale in Europe. A manicure, carwash, or a massage is often only a stone's throw from one's home. Doorman buildings provide round-the-clock service to residents and dog-walkers look after pets during the workday. . . . By contrast, European women work less and have less money to spend on services. In their "free time," European women are busy cleaning the house and looking after the children. On balance, therefore, European and American women work about the same amount of hours.

The Freeman-Schettkat evidence blends nicely with the Nordhaus (2006) discussion of time use summarized below – in several surveys work is actually viewed as more "enjoyable" than several aspects of home production in which German women participate more than American. The Mees list of service occupations that are much more common in America than in Europe echoes Gordon's (1997) recitation of four low-skilled jobs that have long been

common in the U. S. but barely exist in the rich countries of Europe – grocery baggers, busboys in restaurants, parking lot attendants, and valet parkers. As a result of the post-1995 turnaround in Europe's hours per capita, some of these contrasts are lessening, as witness the profusion of "voituriers" (valet parkers) in 2006 Paris.

Idle European Youth

We learned from Figures 6 and 7 that a major contributor to lower labor force participation in Europe compared to the U. S. is not only early retirement but also lower participation and higher unemployment among youth aged 15 to 29. The French riots of the *banlieue* in 2005 remind us that many European youth are marginalized from contact with the market economy. Are unmarried Italian 30-year-old males sitting at home, insisting that their mothers cook for them and do their laundry, because they have a special taste for leisure or because the economy and society do not provide sufficiently rewarding jobs for them?[10]

Differences in the economic environment of American and European youth are pervasive. Because of the flexibility of American labor markets, American high-school students easily find after-school jobs in fast-food restaurants and other service outlets. Instead of receiving government-funded tuition grants for college, American youth are expected both by their parents and by colleges to work part-time during the school year and full-time during the summer. They adopt early a culture of work rather than idleness, and this continues after

10. Roughly 52 percent of Italians between the ages of 20 and 34 live at home with their parents (Rhoads, 2002).

graduation from college. In contrast, judging from the low employment to population ratios for Europeans aged 15-29, much of the time in this European age group is wasted, especially when we recognize the larger share of American youth compared to European youth going to college and hence removed from the employment-population ratio.

Does Conventional Economics Miss the Welfare Valuation of Work vs. Leisure?

Gordon's (1973) reported survey result showed that adult male blue collar workers prefer work to staying at home during the normal work week. Nordhaus (2006, pp. 156-7) reports on a much more extensive set of evidence, the compilation by Robinson and Godbey (1997, p. 243) of several surveys of U. S. households about their degree of "enjoyment" of different activities.[11] The most striking result is that, while some types of leisure activities are more enjoyable than work, in turn work is more enjoyable than other types of leisure and most types of home production.

The many activities ranked in the compilation can be sorted into four groups which have roughly equal evaluations of enjoyment, ranked on a scale of zero to 10. At the top in order with enjoyment scores between 7.8 and 6.3 are stereo, conversations, child play, sleep, eating, and cultural events. In the second group with scores between 5.8 and 6.0 are socializing, grooming, hobbies, child care, religion, reading, sports, and *work*. In the third group with scores of 5.0 to 5.4 (and thus less enjoyable than work) are relaxing, cooking, TV, education, and work commute. In the bottom group with scores of 4.3 to 4.8 are paperwork, organizations,

11. Five surveys were taken from 1965 to 1985 with samples sizes ranging from 133 to 2500.

maintenance, grocery shopping, cleaning, and other shopping.

Nordhaus provides several interpretations of this surprising evidence that are relevant to the current paper. First, the survey results may refer to average rather than marginal evaluations. People want to have some contact with "work," possibly because of its social aspects, but at the margin work has sufficient disutility that few people choose to work in second or third jobs. Second, most workers cannot choose their hours and effectively have a marginal wage of zero, explaining why enjoyment from work does not differ markedly from many other nonwork activities. Third, and consistent with our discussion above which places a different value on leisure hours during the normal work week from leisure hours in the evening and on weekends, is that people place different values on different times of the day and different days of the year. Fourth, Nordhaus considers as inconclusive the criticism that the survey results have methodological flaws.

Nordhaus also raises the issue of simultaneous activities. In his example many home activities mix home production and leisure (cooking while watching TV or socializing with friends and family). To provide a more relevant example for the purpose of the current paper, office workers not only work, but they socialize in the cafeteria or near the vending machines, they use their high-speed internet connections to shop on the web, and some office workers (including two of my former secretaries) play games installed on their office computers. It is possible that the social aspects of work help explain the paradoxical result that work is as enjoyable as some other activities traditionally considered as leisure. But also it is possible that,

at least for adult men, the absence of a job carries with it a social stigma. We have all read anecdotes about unemployed American men in the Great Depression or Japanese men in the 1990s who would dress up and leave the house in the morning so that the neighbors would think they still had jobs, then frittering away the day across town until it was time to return home.

VI. By How Much Does American GDP Overstate Welfare?

Until this point, the paper has been about welfare interpretations of the decline in European hours per capita relative to the U. S. By definition, this decline explains why Europe performs so much better in comparisons with American productivity than in comparisons with American market output per capita. This final section addresses several issues that concern the numerator of the productivity and output per capita ratios, namely real GDP itself. How much does measured real GDP with typical PPP exchange rate translations exaggerate or understate welfare in Europe vs. the United States?

Housing

A considerable part of the U. S. advantage in cross-country comparisons of living standards must stem from the much larger size of average American dwelling units, both their internal dimensions and the amount of surrounding land. Fully three-quarters of the American housing stock consists of single-family detached and attached units. The median living area in the detached units is 1720 square feet, with an average acreage for all single-family units of 0.35

(equivalent to a lot size of 100 by 150 feet or 1420 square meters). Another figure that must seem unbelievable to Europeans is that fully 25 percent of American single-family units rest on lots of one acre or more, roughly 4100 square meters. Available data, although spotty for Europe, suggest that the average American dwelling unit is at least 50 to 75 percent larger than the average European unit.[12] Since construction of new units and imputed rent on old units are included in GDP comparisons across countries, our Europe/U. S. ratio of per capita output in Figure 3 already incorporates the superiority of the U.S. housing stock (as long as the cross-country PPP-based price indexes make adequate allowance for housing quality).

Energy and Metropolitan Dispersion

Yet a European might retort that, while the gap between U. S. and European standards already includes the housing difference, it also includes activities that are not welfare-enhancing. A significant fraction of GDP in the U. S. does not improve welfare but rather involves fighting the environment whether created by nature or man-made decisions. The American climate is more extreme than in Europe (excluding the ex-USSR), and this means that

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12. Average estimated useful floor space of dwellings in 1997 or 1998 was 2058 square feet for the United States and 995 for the average of Austria, Denmark, Finland, and Switzerland (none of the large European countries are listed). For newly constructed dwellings, "average living floor space" for Germany and Italy was 969. See United Nations, *Annual Bulletin of Housing and Building Statistics for Europe and North America 2000,* pp. 21 and 24, obtained from www.unece.org/env/hs/bulletin/00pdf/h10.pdf. An alternative measure for the United States in 2003 is a median square footage of all existing single detached and mobile homes occupied year-round (71 percent of all occupied year-round housing units) equal to 1756. For all newly constructed privately owned single-family houses in 2004 the median was 2140 and the average was 2349. See *Statistical Abstract of the United States: 2006*, Tables 951 and 932, respectively. The former table is the source of the average lot size data given in the text. All available data for the U. S. seem to refer only to single-family units and omit apartments in multi-family units,

some of GDP is spent on larger air-conditioning and heating bills than in Europe to attain any given indoor temperature.

The harsh American climate introduces additional issues in welfare comparisons beyond the narrow calculations of energy use. Americans in most regions of the country are afflicted by meterological events that rarely occur in Europe, including hurricanes, tornadoes, and forest fires. The world learned in early September, 2005, that a hurricane named Katrina could not only devastate a region but also a culture, could send residents to temporary homes hundreds of miles away, and also could reveal squalor and inequality that may not exist to the same degree in most of the EU-15 nations. The U. S. GDP includes a sizeable share of the insurance industry and also self-financed reconstruction that in some regions echoes the destruction of central Europe during World War II.

Some of U. S. GDP is spent on extra highways and extra energy to support the dispersion of the American population into huge metropolitan areas spreading over hundreds or even thousands of square miles, in many cases with few transport options other than the automobile. European real GDP is held down by the correctly measured high price of petrol, but sufficient credit is not given for convenience benefits from frequent bus, subway, and train (including TGV) public transit.

While an economist's first reaction is that the dispersion of U. S. metropolitan areas must be optimal, since people have chosen to buy houses in the outer suburbs, a more careful

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which presumably are smaller in size.

reaction would be to view the American dispersion as related to public policy in addition to private choice, a point related to Alesina's emphasis on political decisions that do not necessarily reveal voter preferences. These policies include subsidies to interstate highways in vast amounts relative to public transport, local zoning measures in some suburbs that prohibit residential land allocations below a fixed size, e.g., two acres, and the infamous and politically untouchable deduction of mortgage interest payments from income tax.

Europeans enjoy shopping from small individually owned shops on lively central city main streets and pedestrian arcades, and recoil with distaste from the ubiquitous and cheerless American strip malls and big-box retailers — although Carrefour, Ikea, and others provide American-like options in some European cities. To counter the effects of American land use regulations that create overly dispersed metropolitan areas, European regulation includes land use rules that preserve greenbelts and inhibit growth of suburban and exurban retailing and have indirectly prevented Europeans from enjoying either the low prices or high productivity growth of American "big box" retailers.

Tastes are in part the result of circumstances and habit, and to the European critique many Americans would deliver a counter-retort. An American mother of two small children wants nothing to do with schlepping those kids through endless tunnels while making connections on the London or Paris subways, or with waiting in the rain for the next bus, or with shopping for groceries more often than once per week. The three-quarters of American households living in single-family units treasure their backyards, decks, and barbeques and do

not want to be forced to go to a public park for outdoor recreation — whose barbeque grill would they use?

European land use planning that restricts the growth of American-style big box retailing is considered by many analysts to be the single most important reason for the slump in European productivity growth shown in Figures 2 and 3 above (see, for instance, Inklaar, O'Mahony, and Timmer, 2005, and McGuckin, Spiegelman, and van Ark, 2005). Reform of European land-use planning is the first-listed recommendation for structural reforms in the comprehensive recent evaluation of the European economy by Baily and Kirkegaard (2004, p. 8). In fact, consideration of American big-box retailing reveals it not only to be a source of rapid productivity growth in retailing since 1990, but also a source of unmeasured U. S. growth in output per capita. As shown by Hausman and Leibtag (2005), Wal-Mart reduces retail food prices by 25 percent, of which 20 percent is the direct effect of its own low prices and the other 5 percent represents the reduction of prices by competitive stores. Because the U. S. Consumer Price Index "links out" price differences among outlets for the same products (the so-called "outlet substitution effect,", the impact of Wal-Mart and other big box retailers in lowering prices is ignored by the CPI and as a result in the deflators for U. S. personal consumption expenditures and GDP. Putting it simply, European restrictions that protect inner-city pedestrian shopping districts create value for the rich, who live inside the city in Europe, while the restrictions that make it hard for low-priced big boxes to establish in the city and suburbs

hurt the poor.[13] This European set of policies that favor the rich and hurt the poor may offset some of the increased skewness of the American income distribution, discussed below.

Even if part of American energy use is not welfare-enhancing, either because it offsets the harsh climate or politically motivate "excess dispersion" of American metropolitan areas, how much could this possibly be worth? Figure 12 displays the time path of energy consumption per dollar of GDP in the U. S. and Europe since 1980. Despite the continuation of low gasoline taxes in the U. S., the gap between American and European energy use has narrowed and now amounts to no more than 2 percent of GDP. If we take half of that gap as welfare-enhancing (the value of heating large interior spaces and driving larger cars and trucks), and the other half as non-welfare-enhancing (offsetting the harsh climate and unnecessary driving caused by excess dispersion and the lack of public transit), the energy story emerges with an overstatement of U. S. welfare by only one percent of GDP. Other U. S. expenditures, including keeping 2 million people in prison, might add another one percent of GDP in non-welfare-enhancing activities.

Insecurity and Inefficiency

Finally, some attention must be paid to the widespread European distaste for American institutions as providing insufficient welfare benefits, job security, and inadequate medical care. Substantial anecdotal evidence, including the excellent new book by Louis Uchitelle (2006) that documents the "human damage" inflicted by layoffs of the low-skilled blue-collar worker and

13. I owe this connection between retail regulation and the income distribution to Ian Dew-Becker.

highly-skilled professional alike. However, to make a separate allowance for the benefits of the European welfare state would amount to double counting. We have compared real GDP per capita between the EU and U. S. on a before-tax, not after-tax basis. Thus (as assumed also by Prescott, 2004) we implicitly assume that high taxes in Europe are buying government expenditures that are valued by households as highly as an equal dollar of private consumption. Ljundqvist and Sargent (2006) question this assumption as ignoring the inherent inefficiency in government spending.

I would offset this alleged inefficiency of government expenditure against the notable inefficiency of the American medical care system, which as shown in Table 2 spends a much larger share of GDP yet produces mediocre outcomes in life expectancy and medical care inputs. As much as three percent of U. S. GDP may be wasted in excessive administrative expenditure by the private insurance companies that run the American medical care system. This is clearly a component of GDP that does not raise the welfare of American consumers of its dysfunctional medical care system and should be added to our final tally of the amount by which market GDP comparisons overstate U. S. welfare.

Inequality, Immigration, and the Black Economy

Three final issues must be considered in an evaluation of European vs. American welfare. The first of these is rising inequality in the U. S. as compared to Europe. As demonstrated by Dew-Becker and Gordon (2005, Table 8), only the top 10 percent of the American income distribution as measured from tax returns over the period 1966-2001 enjoyed

an increase in real labor income as rapid as the growth in labor productivity. The annual growth rate of labor income in the bottom 90 percent was slower than productivity growth. Growth in median labor income per hour was 0.8 percentage points per annum slower than productivity in the total economy. Numerous comparisons from tax data for countries like France and the U. K. show much smaller increases in inequality. In this paper we make no adjustment for the growing skewness of the American income distribution, because such an adjustment would require an inevitably subjective interpretation of the rate at which the marginal utility of income declines as taxpayers in the 90th, 99th, and 99.99th percentiles are compared with those in the 50th percentile.

The second and third issues involve immigration and the black economy. As many as 11 million Americans are illegal immigrants. To the extent that they are working for cash and do not pay taxes, their contribution to GDP is missed, and American GDP is understated. Since most of the illegal immigrants are picked up in the population census, American GDP per capita is understated. Because of tighter border controls, fewer immigrants in the U. K. and continental Europe are illegal. However, any unmeasured GDP in the U. S. should be offset by the incentive in Europe of high labor taxes to enlarge the underground economy. Without definitive information on the role of illegal immigrants in the U. S. as compared to the black economy in Europe, we consider this issue to be a toss-up and do not include it in our final score-keeping in Table 3 below.

VII. Conclusion

This paper examines two classes of arguments implying that standard PPP-based ratios of European output per capita relative to that of the United States understate true European welfare. Most of the paper interprets the puzzle, "why is Europe so productive yet so poor?" What explains the fact that in the mid-1990s Europe almost caught up to the U. S. level of productivity but remained far behind with a ratio of its per-capita income that has languished at between 70 and 75 percent since 1970? Arithmetic isolates a decline in the Europe/U. S. ratio of hours per capita as the sole cause of this puzzle, but then the questions begin.

This paper provides a review of debates involving four leading interpretations of the relative decline in European hours per capita. These are that most or all of the difference represents a different taste for leisure in Europe, that all of the difference reflects high taxes on labor in Europe, that much of the difference represents the effects not of high taxes but of an overly-generous welfare state, and finally that hours per capita have been driven down not by voluntary choices but by political pressure initiated by unions that have promoted legislation ratifying a shorter work week, long vacations, and early retirement.

In sorting through the debate about these explanations, we examine data that allows us to make three distinctions that rarely appear in the literature. First, the time series evidence shows that from 1960 to 1995 only one-third of the relative decline in European hours per capita was due to a decline in hours per employee, i.e., the famous European long vacations and short work week. The remaining two thirds was divided into roughly two-thirds due to falling labor-

force participation and the remaining one-third to rising unemployment, both corrected for differences between the U. S. and Europe in the composition of the working-age population by age group.

Second, the time series data show a distinct turnaround after 1995. While hours per employee continued to fall in Europe relative to the U. S., albeit at a slower rate, there was a complete turnaround in the behavior of employment per capita, from 35 years of steady decline to nine years since 1995 of steady increase. None of the recent literature on European hours, at least that which is cited here, calls attention to this turnaround nor provides any explanation of this phenomenon.

Third, our examination of European vs. U. S. unemployment rates and labor force participation rates by age group shows another little-discussed contrast. The unemployment rate is higher across the board in every European age group, and in several age groups the unemployment rate in 2002 was double that in the same U. S. age group. But for labor-force participation the pattern is completely different. Among prime-age workers (aged 30-44) European participation rates are identical to those in the U. S., whereas participation rates are much lower in the 15-29 and 50-65+ age groups. These patterns make it unlikely that a single explanation of lower European hours per capita can suffice. For instance, if high labor taxes are the dominant cause of falling European hours per capita, why did this not affect the labor force participation rate of prime-age Europeans at all?

We emerge convinced that markets work, and that perhaps as much as half of the

decline in Europe's hours per capita before 1995, and perhaps one-third of the turnaround in hours per capita since 1995, was due to the increase in taxes before 1995 and their decrease since then. Since high taxes are used primarily to buy welfare benefits, the estimated tax effect on hours per capita combines the disincentive effects of taxes and of the welfare benefits that they buy. But the tax-and-benefits story cannot explain all of the differences by age group, in particular why labor-force participation in the prime-age groups is as high in Europe as in the U. S.

The Alesina explanation of political pressure from unions provides at least one plausible explanation of early retirement ages in Europe, which are entirely a political phenomenon built into the legislation that sets retirement ages in government-funded pension schemes. In a back-of-the-envelope calculation, we conclude that early retirement is perhaps the most significant cause of Europe's low standard of living. In our example, a reduction of the retirement age from 65 to 55 with a balanced-budget government-funded pension scheme and no private saving would reduce market consumption by 25 percent and reduce welfare by 22 percent, leaving only a 3 percent offset from the value of the leisure of early retirees.

Regarding the post-1995 turnaround, most research to date cannot address the turnaround as the data has typically extended only to the mid- or late-1990s. But preliminary research by Dew-Becker and Gordon (2006) applied to data from 1960 to 2004 suggests that taxes work symmetrically, explaining a substantial share of the decline in hours per capita in Europe before 1995 and also a substantial albeit somewhat lesser share of the post-1995 rebound

in hours per capita.

In earlier work Gordon (1997), I suggested that there was a tradeoff between unemployment and productivity, using the standard textbook model of labor supply and demand. Anything that made labor more expensive in Europe, including a high minimum wage and high taxes, would push firms northwest up the labor demand curve, would cut low marginal-productivity jobs, would reduce hours and employment, and would raise average productivity. In contrast the United States with its flexible labor markets, lower taxes, and lower minimum wage would emerge with lower average productivity and higher hours and employment.

My conjecture is that since 1995 Europe has become less unlike the United States, helping to explain the turnaround in the employment-population ratio. While differing across European countries, there has been the introduction of flexible employment contracts, a weakening of employment protection enforcement, and a reduction in the real minimum wage. In contrast in the U. S. the relative decline in hours per capita has a different source, an explosion of productivity growth that has enabled firms to cut costs, particularly labor costs.

The last part of the paper is about possible dimensions in which measured PPP GDP overstates welfare in the United States compared to Europe. The easiest case to make is that the U. S. has a harsher climate and so some of the extra energy consumption in the U. S. (measured relative to GDP) is not welfare-enhancing. A more debatable position is that the U. S. has long instituted policies that have created overly dispersed metropolitan areas with few public transit

options, also leading to excess energy use. However, the extra use of energy in the U. S. compared to Europe is currently worth only around two percent of GDP, so that any allowance for "excess" energy use could at most account for only one percent of GDP. Our discussion of GDP overstatement also makes an allowance of one percent of GDP for excessive incarceration in prisons. A brief discussion of insecurity, inefficiency, inequality, immigration, and the black economy identifies only one further source of overstatement of U. S. GDP, and this is the estimated three percent of GDP that is lost to the inefficiency of the dysfunctional U. S. medical care system.

Table 3 summarizes the results of the paper. In the top line we start with a Europe-to-U.S. ratio of 68.8 percent for real GDP per capita and in the next-to-bottom line we contrast that with a ratio of 89.2 percent for productivity, i.e., real GDP per hour. How much can we add to the initial ratio of 68.8 percent? By far the largest addition is 7.9 points to reflect the value of leisure reflected in declining European hours per employee, much of which involves longer vacations and shorter work weeks which are doubtless of considerable value. These extra hours of leisure in Europe are valued at 2/3 of the market wage. However, for the reduction in the employment-to-population ratio, we view this as largely involuntary and, using our example of early retirement, providing a relatively small value of additional leisure. This adds another 0.9 percent. The three adjustments to real GDP add, first, 2.0 points for excess U. S. energy use. Another 1.0 percent is added to reflect the wasted resources created by excess incarceration and the creation of a gigantic prison population of 2 million people who in their future life are

deprived of educational and job opportunities as a result of their prison records. Third, 3.0 percent of U. S. GDP is added to reflect the excess administrative costs of the American medical care system, with its battalions of clerks employed by insurance companies to dispute claims submitted by doctors and hospitals, and the countervailing battalions of extra clerical personnel employed by doctors and hospitals to pursue their half of the never-ending battle.

Adding together these supplements to the European standard of living raises the ratio from the initial 68.8 percent at the top of Table 2 to a more robust 82.6 percent, and this explains fully two-thirds of the initial 20 point gap between the Europe/U. S. ratio of output per capita to output per hour. The gap between Europe's output per capita and the U. S. output per capita is, however, 31 percent as contrasted to the 20 percent gap between Europe's output per capita ratio and its productivity ratio. The adjustments proposed in this paper make up for 44 percent of the total gap in the standard of living between Europe and the U. S., as shown on the bottom line of Table 3. The remaining 56 percent, or 17.4 percentage points remains intact, and a substantial part of this difference must reflect the quantifiable superiority of the American housing stock to that in Europe.

Almost everything discussed in this paper is debatable. Some of the adjustments are subjective. But this paper is the first to put the issues in the terms of the matrix format of Table 3. Future research will need to address Table 3, should additional line items be added, and in which way should individual items be changed, should they be moved higher or lower? This paper begins the process not just of debating the causes of relatively low hours per capita in

Europe but also of rethinking the translation of real GDP into welfare comparisons across countries and regions.

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Table 1

Levels and Growth Rates of Three Ratios of Europe to the United States, 1960-2004, percent

	Hours per Capita	Hours per Employee	Employees per Capita
1960	119.8	102.4	115.9
1970	102.4	97.4	105.6
1995	73.6	87.1	85.7
2004	77.2	85.4	91.7
Annual Growth Rates			
1960-70	-1.6	-0.5	-0.9
1970-95	-1.3	-0.4	-0.8
1995-2004	0.5	-0.2	0.8

Table 2
Health Care Spending and Outcomes, U. S. versus Six Other Nations, 2003

	Health Spending As Percent of GDP	Life Expectancy at Birth	Doctors per Capita	Nurses per Capita	Acute Care Hospital Beds per Capita	MRI Units per Capita	CT Scanners per Capita
United States	**15.0**	**77.2**	**2.3**	**7.9**	**2.8**	**8.6**	**13.1**
Canada	**9.9**	**79.7**	**2.1**	**9.8**	**3.2**	**4.5**	**10.3**
France	**10.1**	**79.4**	**3.4**	**7.3**	**3.8**	**2.8**	**8.4**
Germany	**11.1**	**78.4**	**3.4**	**9.7**	**6.7**	**6.2**	**14.7**
Italy	**8.4**	**79.9**	**4.1**	**5.4**	**3.9**	**11.6**	**24.0**
Japan	**7.9**	**81.8**	**2.0**	**7.8**	**8.5**	**35.3**	**92.6**
United Kingdom	**7.7**	**78.5**	**2.2**	**9.1**	**3.7**	**5.2**	**5.8**

Source: www.oecd.org, "OECD Health Data 2005 - Frequently Requested Data" release of 12 October 2005.

Note: Doctors, nurses, and acute care beds are per thousand population. MRI and CT per million population.

Table 3

Summary of Adjustments to the Europe-to-U.S. Ratio of Per-capita Income, 2004

	Europe-to-U. S. Ratio of Real GDP per Capita	Adjustment to Leisure Component of Hours	Adjustment to GDP
Market PPP Ratio of Y per Capita	68.8		
Add: 2/3 of Difference in Hours per Employee (11.8)		7.9	
Add: 1/10 of Difference in Employment per Capita (8.6)		0.9	
Add: Half of Energy Use Difference			1.0
Add: Prisons and Other			1.0
Add: Medical Care Inefficiency			3.0
Sum of Market PPP Ratio and above Additions	82.6		
Market PPP Ratio of Y per Hour	89.2		
Percent Prody Gap Explained	67.6		
Percent Total Gap Explained	44.2		

Figure 1. Real GDP per Capita, Europe-15 and United States, 1960-2004, in thousands of averaged 1990 G-K and 2002 E-K-S U. S. Dollars

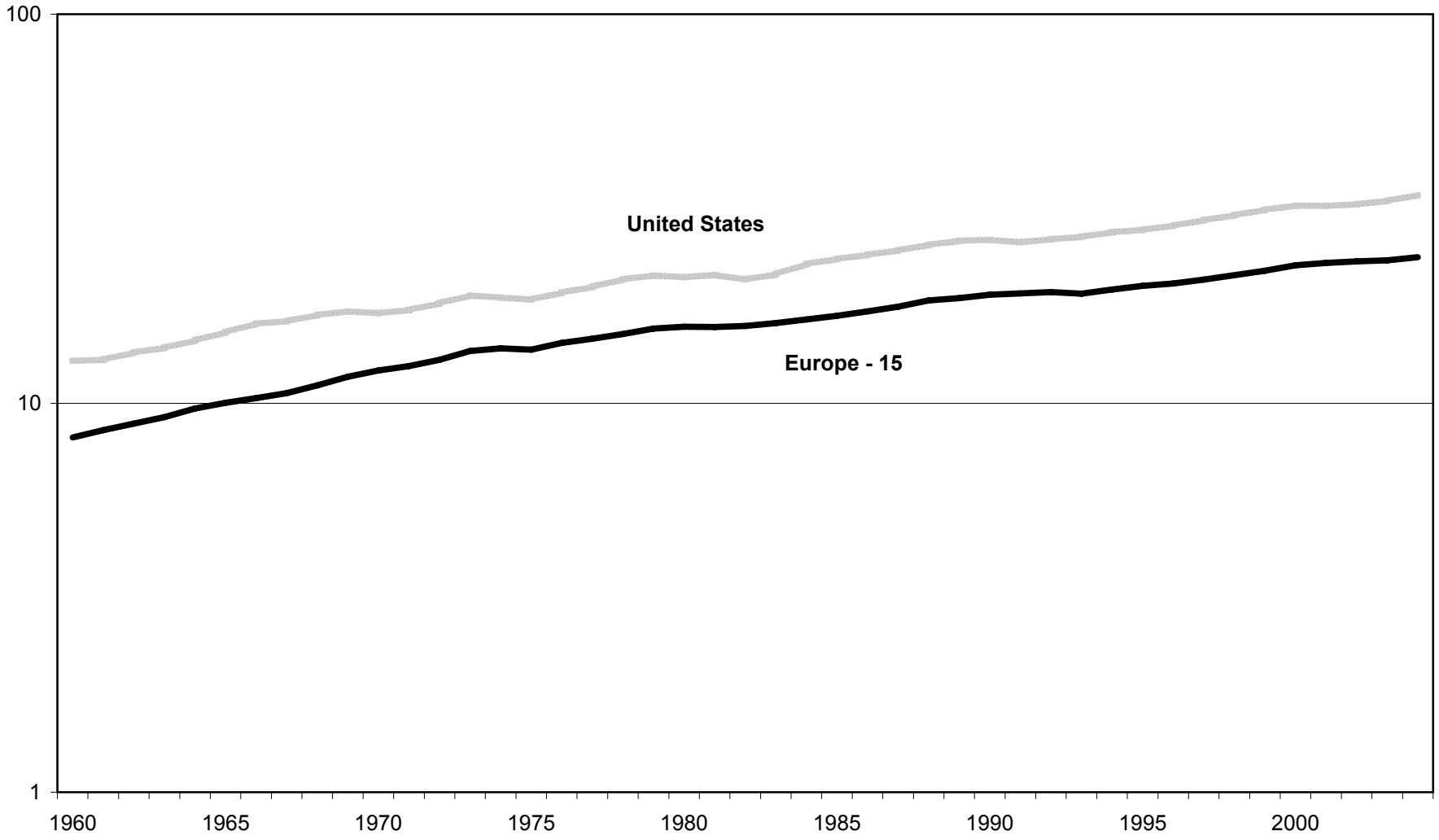

Figure 2. Real GDP per Hour, Europe-15 and United States, 1960-2004, in thousands of averaged 1990 G-K and 2002 E-K-S U. S. Dollars

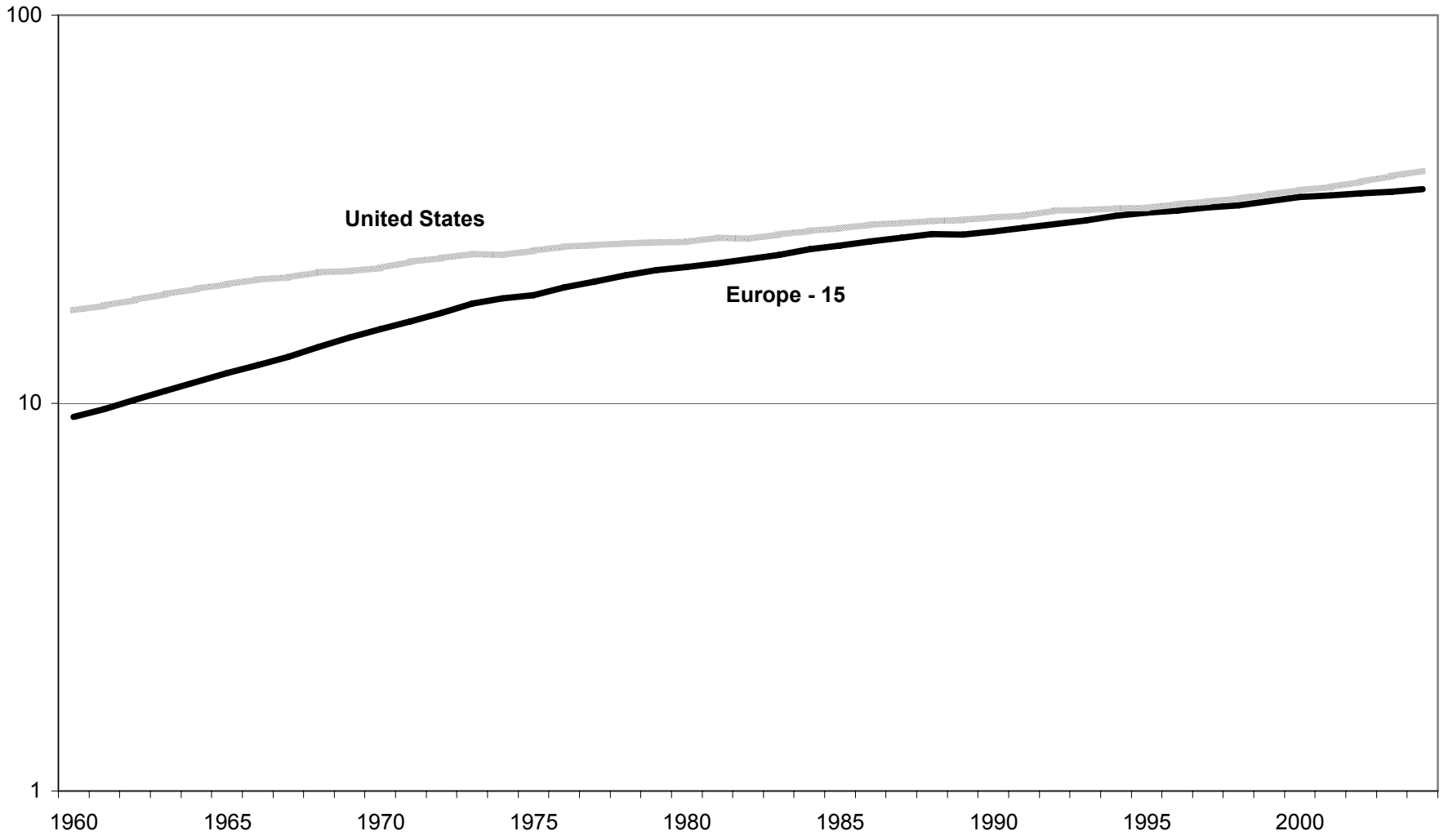

Figure 3. Ratio of Europe-15 to the United States, Output per Capita and Output per Hour, 1960-2004

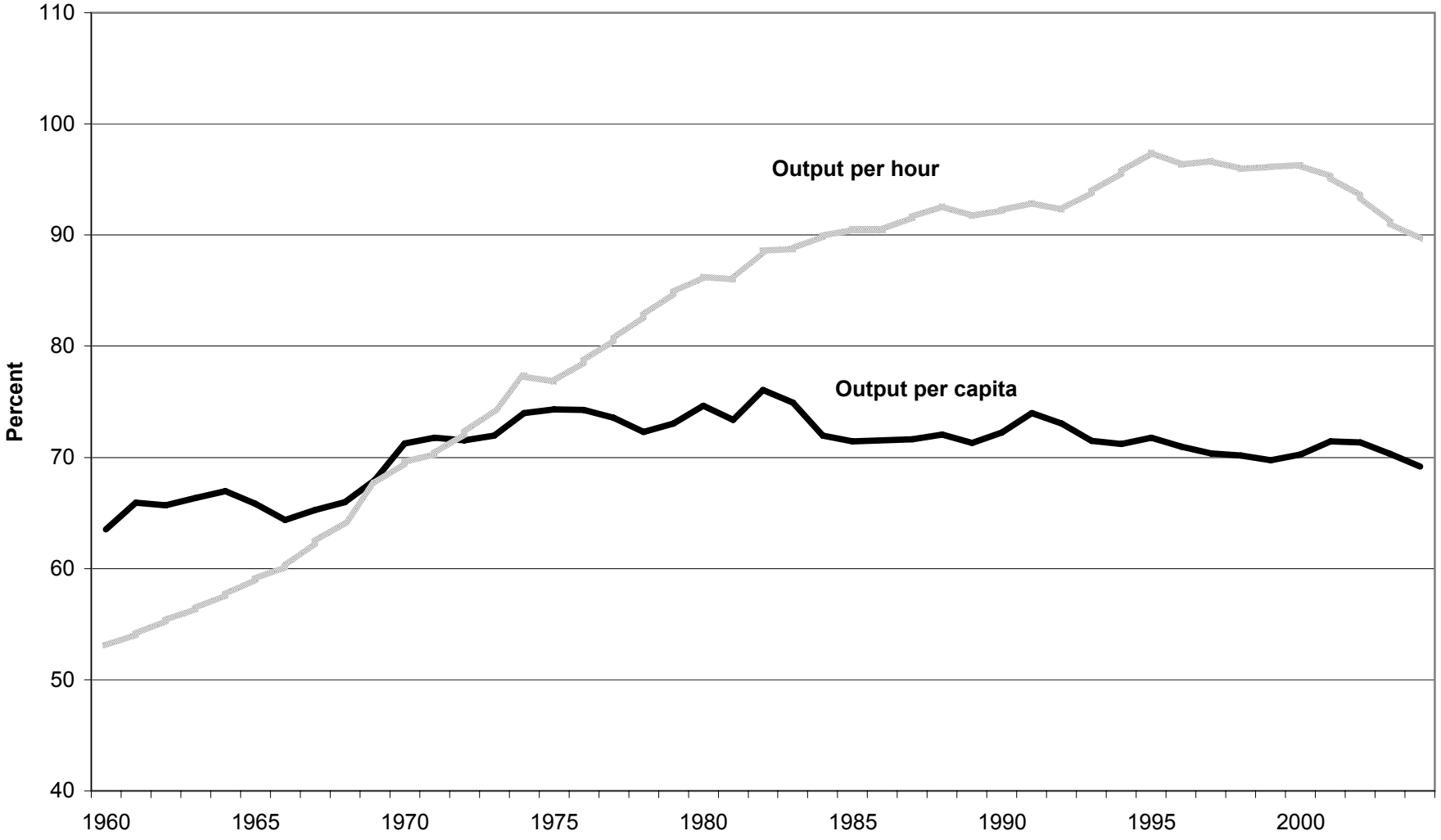

Figure 4. Ratio of Europe-15 to the United States, Hours per Capita, Hours per Employee, and Employees per Capita, 1960-2004

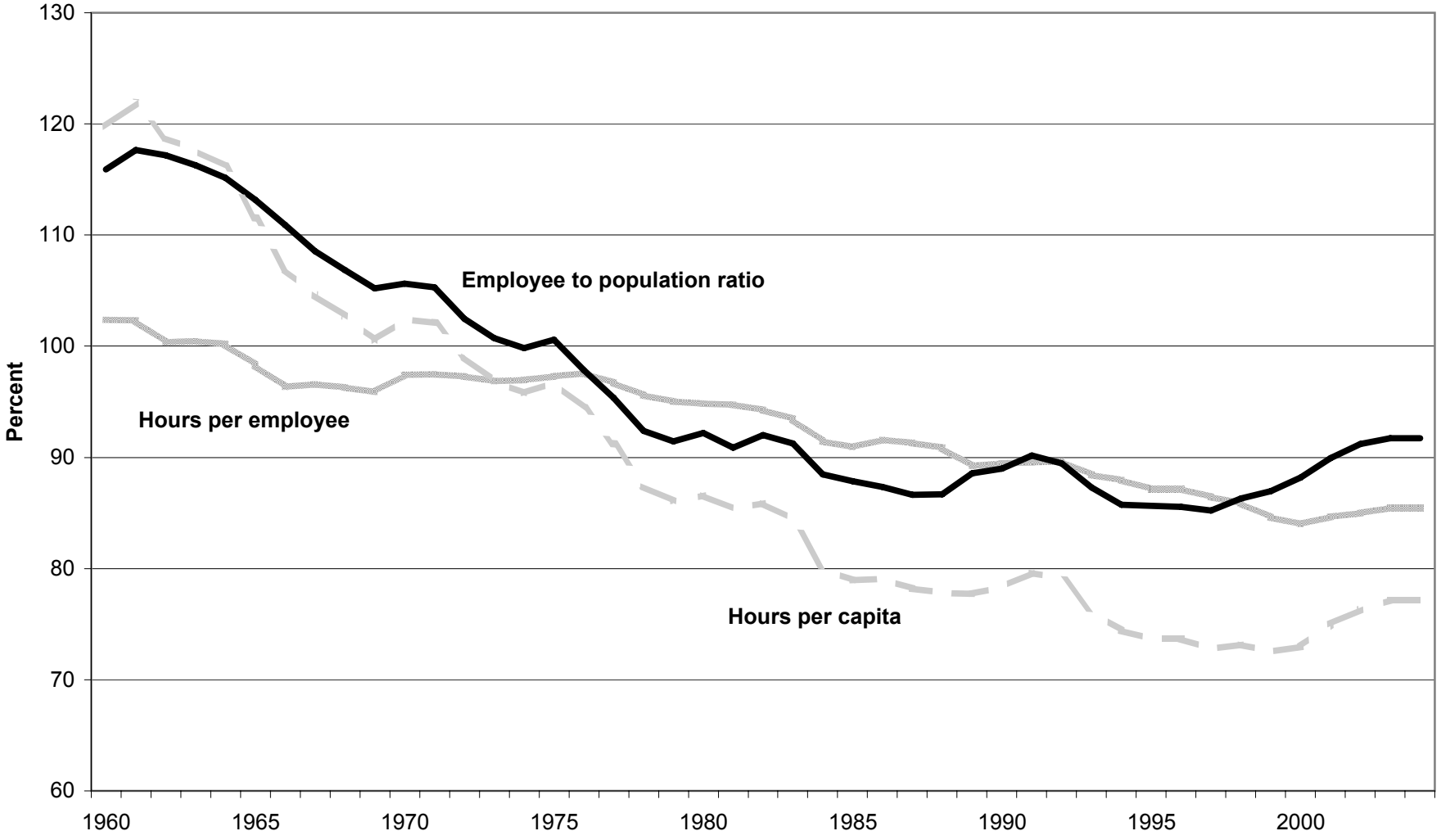

Figure 5. Hours per Employee, Europe-15 and United States, 1960-2004

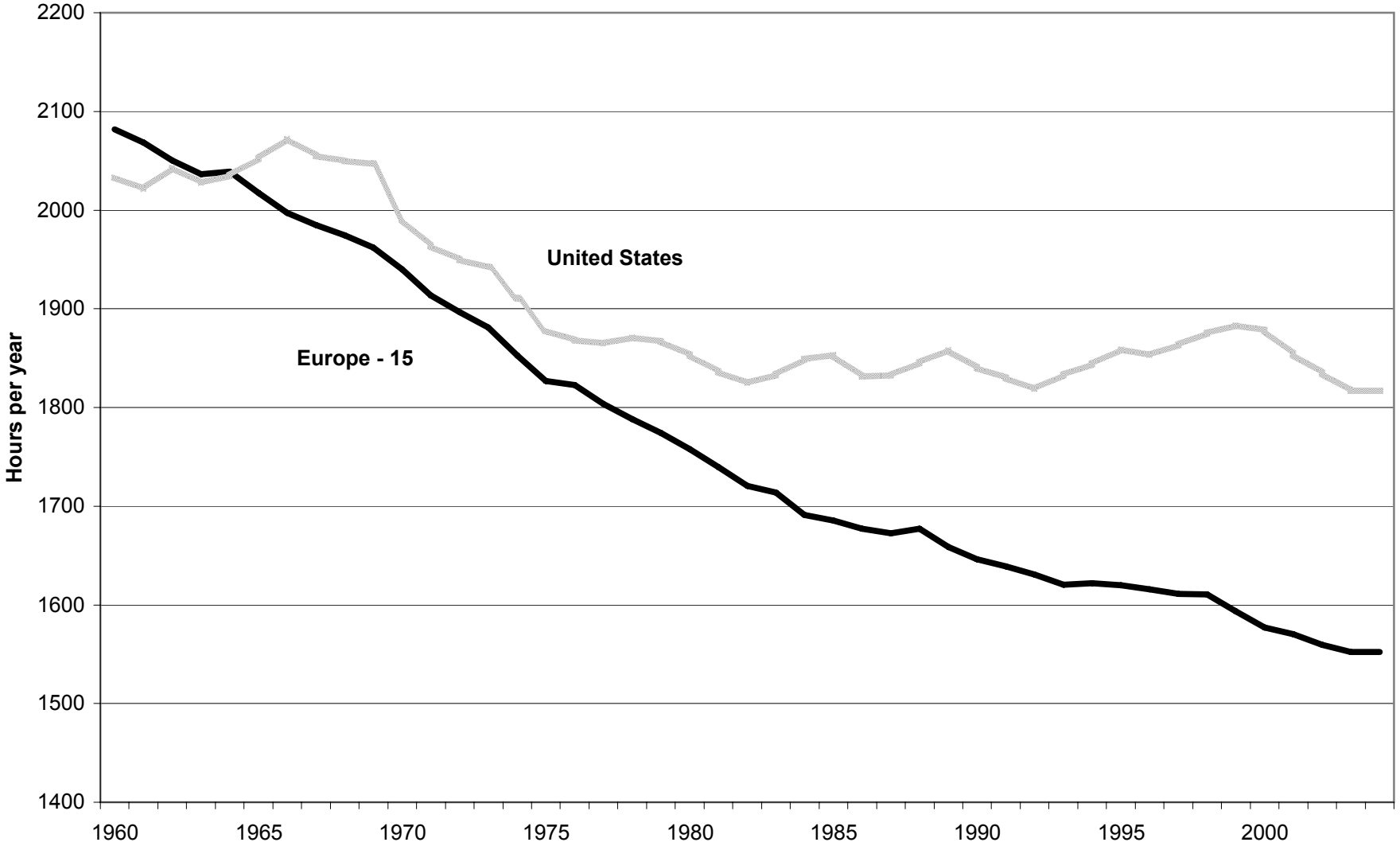

Figure 6. The Employment-Population Ratio, Europe-15 and United States, 1960-2004

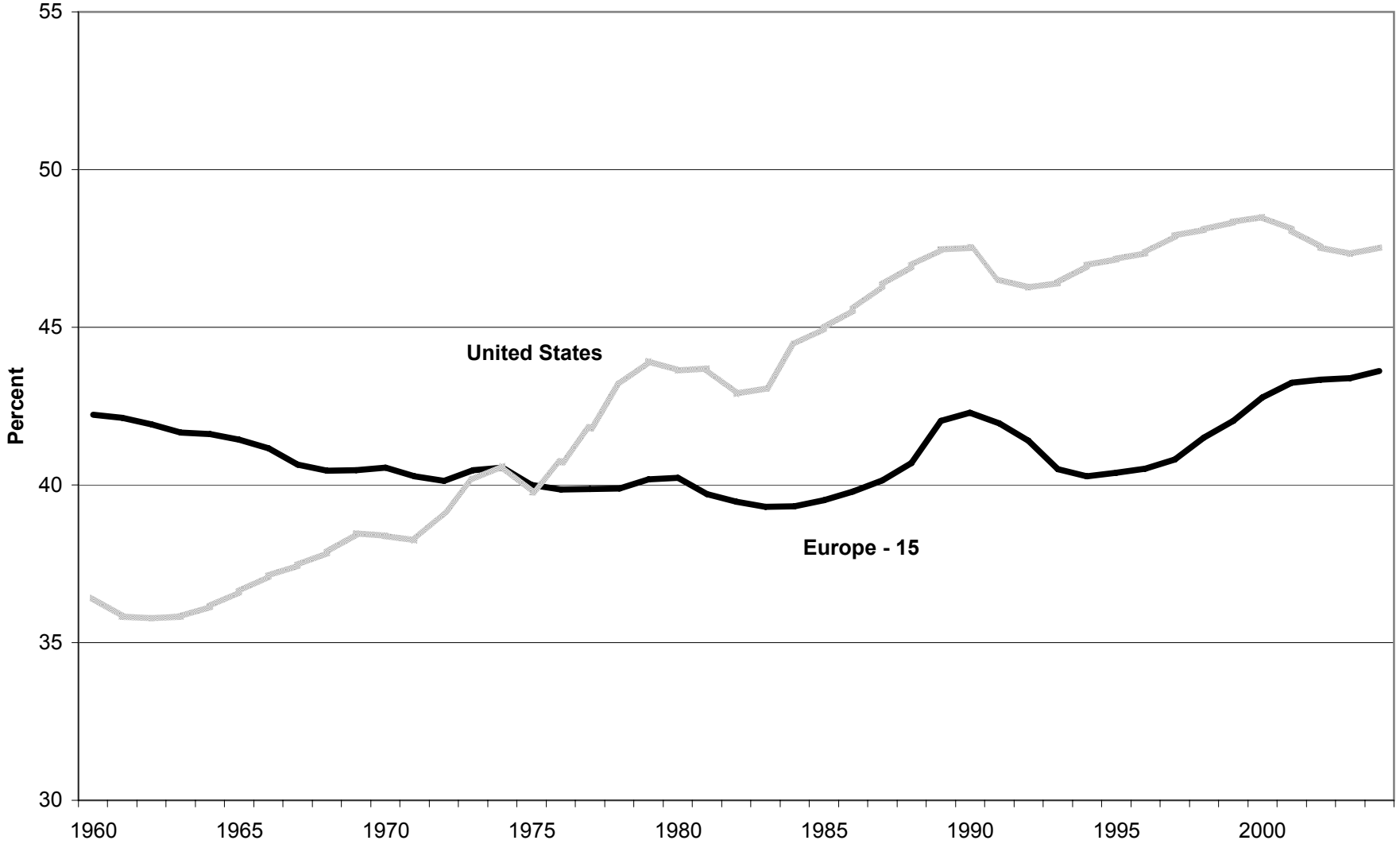

Figure 7. Unemployment Rates by Age Group, Europe-15 and United States, 2002

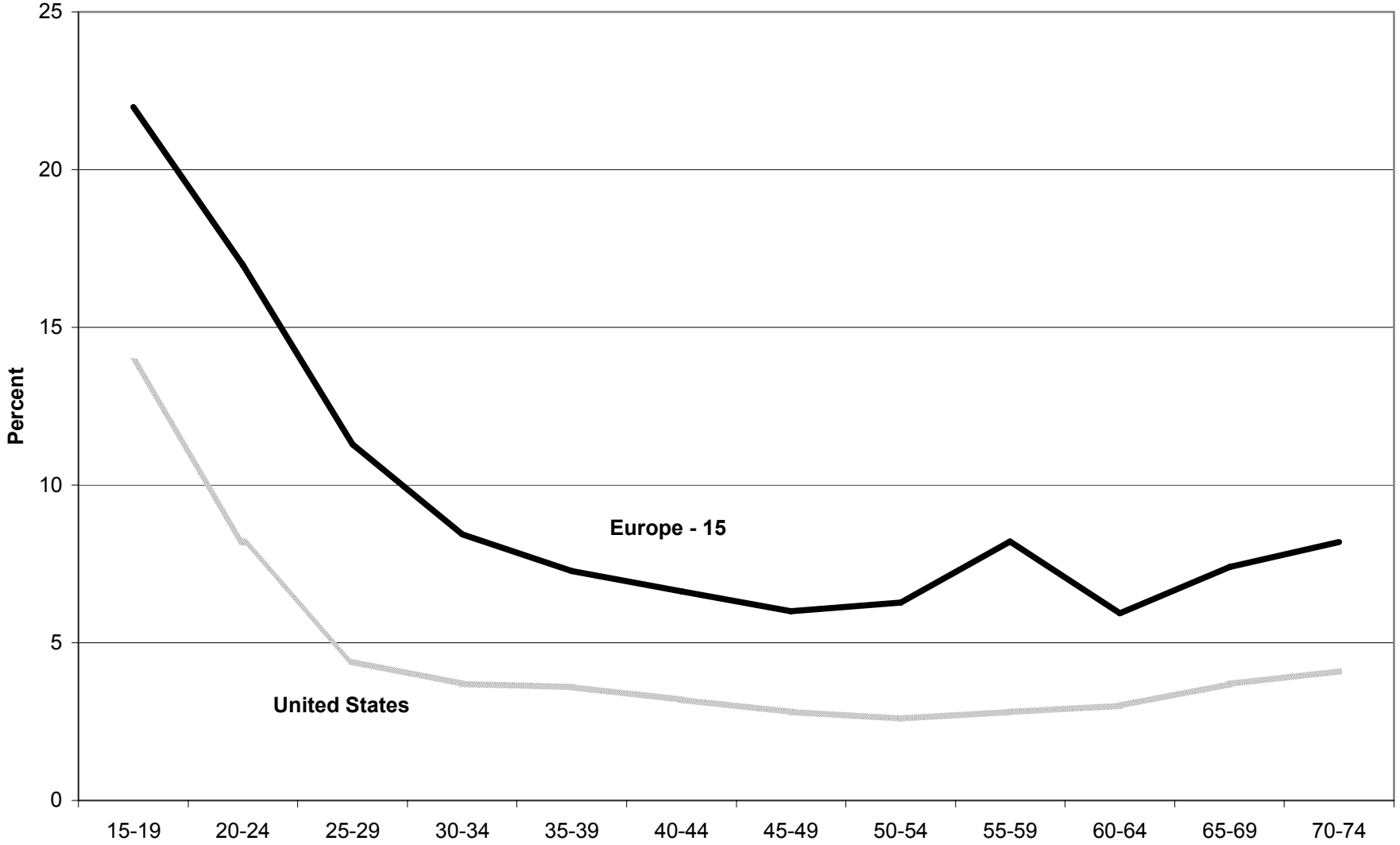

Figure 8. Labor-force Participation Rates by Age Group, Europe-15 and United States, 2002

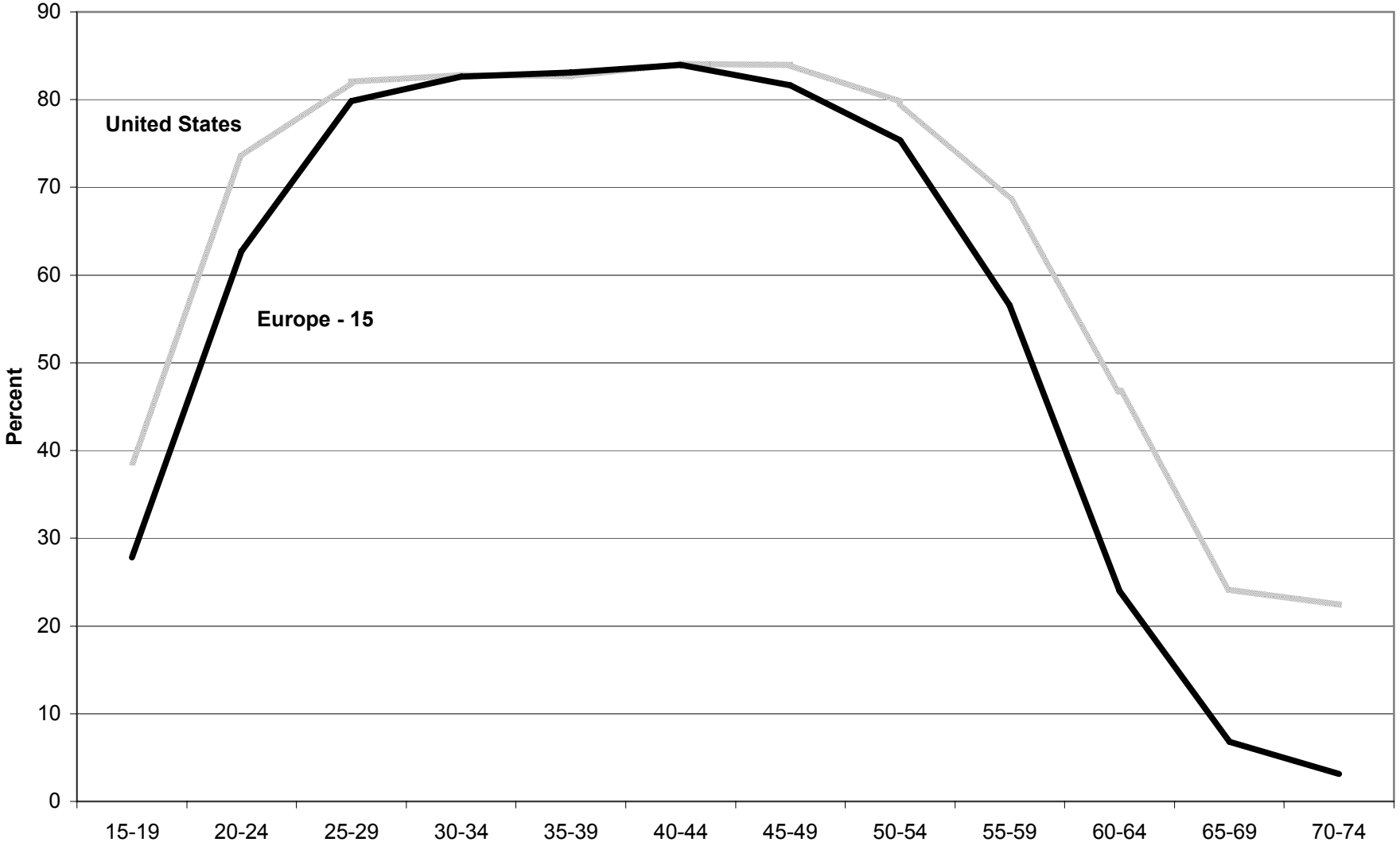

Figure 9. Employment-Population Ratios by Age Group, Europe-15 and United States, 2002

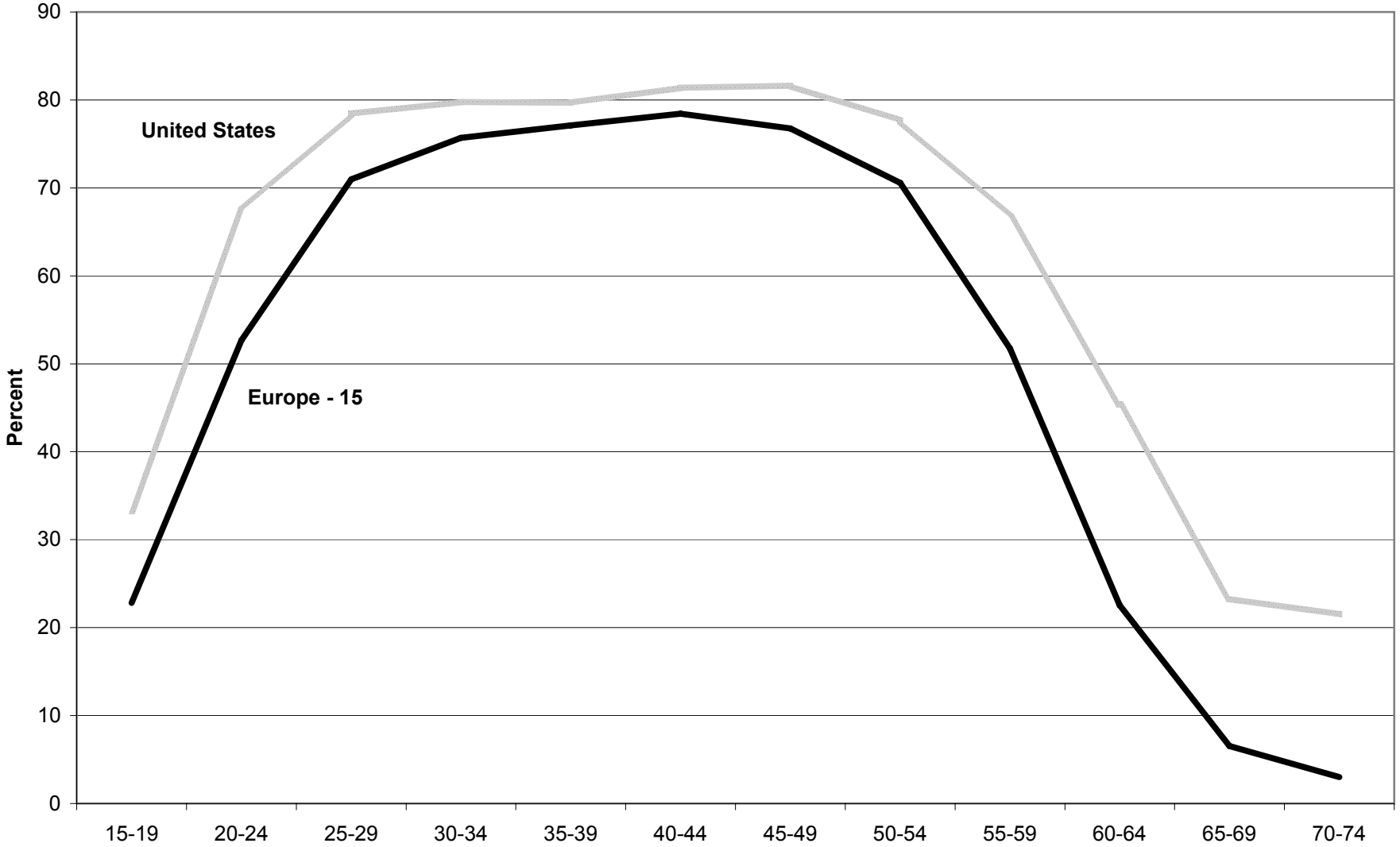

Figure 10. Share of Population by Age Group, Europe-15 and United States, 2002

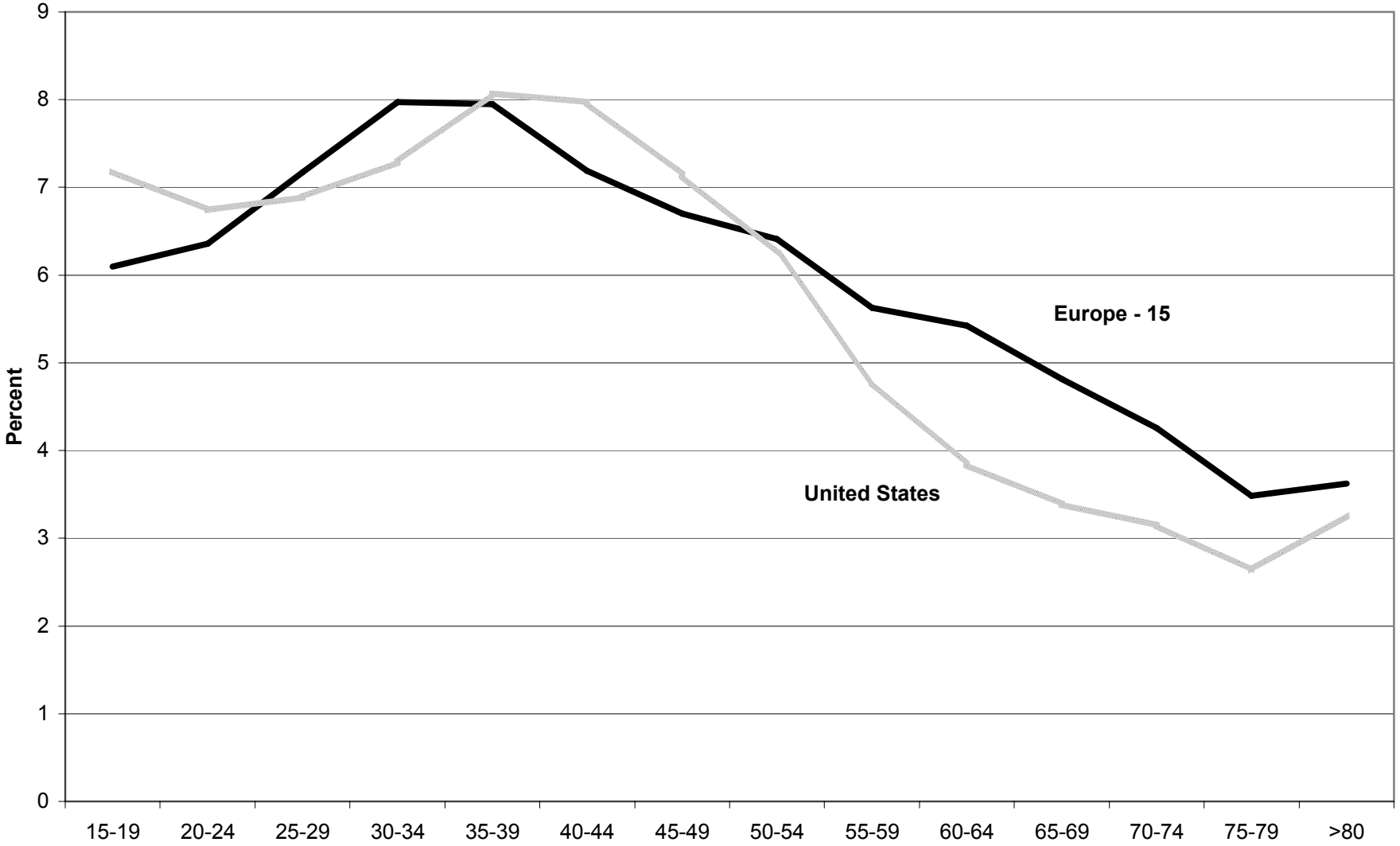

Figure 11. Labor Demand and Supply

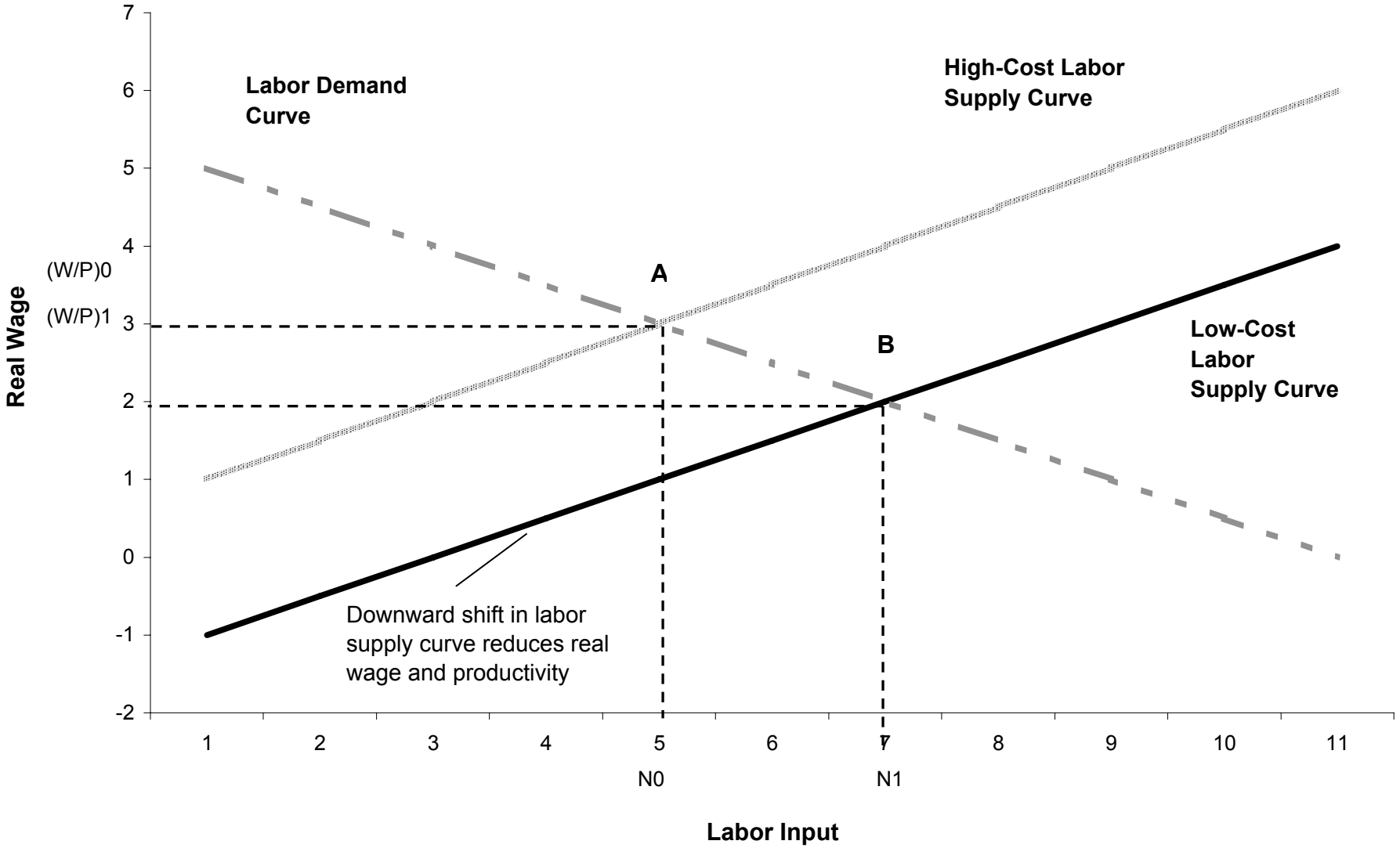

Figure 12. BTUs of Energy Consumption per Dollar of GDP, Europe-15 vs. United States, 1980-2002