Labor and the Sustainability of Output and Productivity Growth

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Revised draft: May 8, 2001

Prepared for the Sustainable Employment Initiative organized by the Russell Sage Foundation and the Century Foundation. Shapiro also acknowledges additional support from the National Institute on Aging (P01-AG10179) and from the National Science Foundation (SRB-9617437). We are grateful to Robert Shimer and Robert Solow for comments on an earlier draft. The authors thank Mark Long for outstanding research assistance.

ABSTRACT

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Output and productivity growth increased substantially over the second half of the 1990s. This paper investigates the contribution of labor to this increase in growth and assesses how labor-market outcomes affect the sustainability of these increases. The paper finds labor input and earnings had similar, sustained expansions during the 1960s, 1980s, and 1990s. While there is some evidence consistent with the "new economy," the similarities among recent expansions are more striking than the differences. The bulk of aggregate earnings growth came from wage increases, but a significant share came from population growth and, to a lesser extent, increases in employment. The earnings changes appear to be matched by close-to-equivalent changes in output and capital accumulation. These results suggest that the labor market will be able to sustain the increase in output and productivity seen in recent years. It may be harder to repeat these growth rates in the future due to expected smaller increases in female labor force participation and the aging of the baby boom.

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As the expansion of the 1990s has continued into the first year of the new century, there is ongoing interest in understanding the surge of output and productivity growth that this expansion has brought. The labor market plays a crucial role for both output and productivity. Labor is the most important factor of production in terms of value added. Labor is also substantially more easy to reallocate from old to new activities than capital, so the dynamics of the labor market should give it a leading role in the economic transition toward new industries and new technologies. On the other hand, the cost of change for labor is not negligible. Workers make investments in specific education and skills and choose to live in specific locations. Firms and workers together make employment matches and undertake match-specific investments. Hence, technological progress that leads to aggregate growth can still have adverse impacts on particular individuals or groups.

This paper provides an empirical framework for examining labor inputs and their relationship to output and productivity growth. Our basic approach is to decompose changes in the return to labor into its various components, including population growth, employment growth, growth in time worked among the employed, and growth in earnings. We compare the contribution of these components to aggregate earnings over the economic cycles of the 1960s, the 1980s, and the 1990s, all of which included a sustained expansion. The results provide us with insight about how the cycle that started in 1990 is similar to and different from other recent periods of economic growth.

We are particularly concerned with the sustainability of economic growth achieved in the 1990s. Our decomposition of labor input lets us separate components that are likely to be

cyclical from those that are likely to be sustainable. We also compare aggregate earnings growth with growth in output and growth in capital stock to see if recent earnings increases are moving together with these other measures. Finally, we evaluate the extent to which there is evidence for the "new economy" in the labor market, particularly in terms of the allocation of labor by occupation and industry, as well as the differential return to skilled versus unskilled workers.

To preview our main results, the market outcomes for labor in the 1990s are remarkably similar to those of the 1960s and 1980s. The growth in labor input over the cycle comes largely from population growth, with some increase in labor force participation. In the 1960s and the 1990s, the bulk of annual earnings growth comes from increased wages (weekly earnings in our calculations) and not from the expansion of labor inputs. There is a great deal of heterogeneity in the underlying level and composition of annual earnings increases among different demographic groups, however. Annual earnings gains among lower skill groups are much more reliant on growth in their labor inputs than in their wages.

There is strong evidence that these earnings increases can be sustained by concurrent increases in technology and capital. There are, of course, sources of output expansion in the 1990s expansion that cannot continue indefinitely. These are largely related to long-run trends in the labor market (e.g., deceleration in the growth of female labor force participation) rather than short-term unsustainable excesses of an overheated economy. Such factors may limit growth in future expansions, but do not threaten a reversal of recent gains. Future growth possibilities will also depend upon the levels of work and earnings among a growing group of older persons, immigration policy, continued high wage (and productivity) growth among more skilled workers, and the potential for future wage (and productivity) growth among less skilled workers.

I. Analytical Framework

A. A Decomposition of Growth in Labor, Earnings, and Output

We use an identity similar to Okun's Law that allows us to decompose total weeks of work into various margins of adjustment.[1] We consider the identity

$$W_t = N_t \cdot \frac{E_t}{N_t} \cdot \frac{W_t}{E_t} \tag{1}$$

where W_t is total weeks of work in year t, N_t denotes population, and E_t denotes employment. This representation of Okun's Law is abbreviated: the participation margin and the unemployment margin are not separated, but rather treated together in the employment/population ratio (E_t/N_t). Though we use equation (1) for many of our results, we will also present separate results on participation and unemployment. This identity can be thought of as applying to the aggregate economy, to specific demographic groups, or, abstracting from population, to an individual.

Equation (1) truncates Okun's Law at the quantity of labor margin. Though this margin is the focus of much of our analysis, we also take the further step of adding earnings or output to this equation. The standard implementation of Okun's Law focuses on output or productivity. In steady state with a constant labor share, output and earnings will move proportionally. We focus on the results based on earnings because these data are measured from the same source as our labor input data. Thus, we complete the Okun's Law identity by adding earnings per week (Y_t/W_t) to equation (1). We can examine the decomposition of total earnings as

$$Y_t = N_t \cdot \frac{E_t}{N_t} \cdot \frac{W_t}{E_t} \cdot \frac{Y_t}{W_t}. \tag{2}$$

Similarly, we can complete the identity in terms of output (Q_t) by adding productivity (Q_t/W_t) to equation (1). The difference between growth in earnings (Y_t) and growth in output (Q_t) is the

difference between the growth rates in weekly earnings (Y_t/W_t) versus weekly productivity (Q_t/W_t). This leads to the decomposition

$$Q_t = N_t \cdot \frac{E_t}{N_t} \cdot \frac{W_t}{E_t} \cdot \frac{Q_t}{W_t}. \tag{3}$$

Most of our results will be expressed in terms of growth rates. To a first order approximation the growth rate in aggregate earnings is the sum of the growth rates of its components. Hence, we will examine the decompositions

$$\Delta Y_t = \Delta N_t + \Delta\left(\frac{E_t}{N_t}\right) + \Delta\left(\frac{W_t}{E_t}\right) + \Delta\left(\frac{Y_t}{W_t}\right) \tag{4}$$

and

$$\Delta Q_t = \Delta N_t + \Delta\left(\frac{E_t}{N_t}\right) + \Delta\left(\frac{W_t}{E_t}\right) + \Delta\left(\frac{Q_t}{W_t}\right) \tag{5}$$

where ΔX_t denotes the growth rate in variable X_t. Because we compute these changes from sequential cross-sectional samples of individuals, the only meaningful results are for groups of individuals or aggregates.

The first step in the paper is to decompose the increase in aggregate earnings into its four components during each of the three recent sustained expansions in the 1960s, the 1980s, and the 1990s. We also decompose the growth in aggregate earnings among groups of workers identified by sex, race, age, education, and so on. The aim of these decompositions is to identify from what groups and along what margins labor is adjusting during the expansion.

B. Sustainable versus cyclical components

The decomposition presented in the previous section can be used to tell us something about the question of sustainability. Technological change, population change, and other

exogenous changes in labor supply are presumably secular and sustainable sources of long-run growth (Solow, 1956). The simple mechanics of a balanced growth model are as follows:

- Employment grows at rate n.
- Technology grows at rate g.
- Capital accumulation adjusts endogenously to grow at rate $n + g$.
- Consequently, output will grow at rate $n + g$, while labor productivity, per capita income and consumption, and real wages will grow at rate g.

Hence, the rate of expansion of the overall economy is driven by growth in factors of production (labor and capital) plus the growth in technology. The decomposition discussed in the previous section aims to quantify these growth rates. Growth in total labor input (measured as total work weeks W in our measurement framework) is decomposed into several sources: growth in population, the employment rate, and weeks worked per worker. Growth in technology is estimated from either the growth in wages (income per week) or productivity (output per week).

A key insight from the Solow model is that capital accumulation must respond endogenously to exogenous growth in labor and technology to maintain the economy at the steady-state growth rate warranted by growth in labor and technology. Growth in labor input and technology will translate one-for-one into growth in output and earnings only if it is accompanied by the necessary amount of capital accumulation. Hence, capital accumulation is critical to the sustainability of growth from technology and labor input. The boom of the 1990s is distinctive in the high and sustained level of investment that accompanied it. In Section VI, we will present aggregate and industry-level evidence about capital accumulation. Our assessment of whether capital accumulation is keeping up with pace of growth in labor and

technology is an important key to understanding whether growth in income and wages are sustainable.

Cyclical factors can contribute to observed growth rates of labor input, wages, and productivity. Of the four terms in our decomposition, population itself is the only term that is clearly secular (at least at horizons relevant for this analysis). The other components of labor input have both secular and cyclical components. There are important trends in labor force participation driven by forces beyond the business cycle. Yet, the cycle might accelerate and decelerate participation about this trend. Similarly, there have been notable changes in the unemployment rate in the 1990s, some of which might be sustainable (Katz and Krueger, 1999). More generally, the employment rate (E/N) and the intensity of employment (W/E) relate to work effort, which is likely to have a substantial cyclical component.

Likewise, real wage (Y/W) and productivity (Q/W) growth are not pure measures of the growth in technology. Starting with Solow's (1957) original work on productivity measurement, economists have recognized that measured productivity has components relating to factor utilization that cause procyclical deviations of measured productivity from technology. Procyclical changes in measured productivity can come from capital utilization or labor effort. Countercyclical changes can come from adjustment costs associated with changes in investment rates.[2] Wage rates have further cyclical complications as measures of productivity because wages are unlikely to reflect marginal products on a period-by-period basis. Over the horizon that we analyze the data, however, we do not expect this to be a problem.

The cyclicality of labor input and of deviations in measured productivity from technology confound each other. Cyclical movements in participation, employment, and intensity of work that drive labor input go hand-in-hand with cyclical movements in effort and factor utilization

that drive productivity. Indeed, the correlation between labor input and the cyclical component of productivity motivated the formulation of Okun's Law that output moves more than one-for-one with unemployment.

One key issue for sustainability of the current expansion is whether the recent acceleration in the growth in technology is cyclical or not. There is growing evidence that the increase in the pace of productivity growth during the second half of the 1990s is due to technology rather than cyclical factors (Oliner and Sichel, 2000; Jorgenson and Stiroh, 2000; Nordhaus, 2000). Basu, Fernald, and Shapiro (2000) specifically address the question of cyclical productivity. Using structural econometric techniques they find that technological change, not cyclical factors, explains the increase in productivity in the second half of the 1990s. Gordon (1999, 2000) – though a "new economy" skeptic – uses different techniques to conclude that the rebound of productivity in the late 1990s is not mainly a cyclical phenomenon.[3] Finally, there is yet no sign of the typical end-of-expansion slowdown in productivity growth (Gordon, 1979).

In this paper, we present peak-to-peak growth rates to abstract from cyclical factors rather than undertaking explicit cyclical adjustments. We also report results showing that the intensive margin of employment does not contribute much to growth over the cycles, which suggests that cyclical factors in productivity are not important over the entire cycle.[4] Nonetheless, there is substantial uncertainty about how much of the growth in the 1990s is cyclical, especially since the business-cycle peak was not in evidence going into 2000. In particular, we can only guess whether the decline in unemployment witnessed in the second half of the 1990s is sustainable.

C. Industry reallocation and the "New Economy"

Employment shifts into industries with relatively high productivity can be a source of aggregate productivity growth. The industrial revolutions of the 19th and early 20th century were

accompanied by shifts from agriculture to manufacturing. We can use our industry-specific results to look for evidence of similar shifts to electronics manufacturing and certain business services where the development and use of new technologies is concentrated. We can assess how broad-based any shifts in employment are, that is, the extent to which they are shared across demographic and educational groups.

We can also use industrial and occupational detail to look for evidence of the "new economy." We will examine whether growth in labor input has been particularly important in industries such as durable-goods manufacturing (i.e., computers and telecommunication equipment), telecommunications, and other computer-intensive industries. Similarly, we will examine whether there are distinct patterns in the changing occupation or industry mix that might indicate a departure from trends of past expansions.

II. Data

A. Labor force and earnings

Our primary data come from the Outgoing Rotation Groups (ORG) of the Current Population Survey (CPS), which are available from 1979 through 1999.[5] Our sample includes all non-institutionalized civilians who are aged 16 years or older. Because we want to abstract from cyclical changes, we use peak-to-peak data that bracket the cycles of the 1980s and 1990s. We choose the 12-month periods centered on NBER reference peaks as starting and ending points of the cycles. To bracket the peaks in January 1980 and July 1990, our data on the 1980s is measured from July 1979 to June 1980 (referred to as 1979-80) to calendar year 1990. Our data for the 1990s is measured from calendar year 1990 (which brackets the July 1990 peak of the previous cycle) to calendar year 1999. This endpoint is mandated by the availability of data at

the time this paper was written. It is not yet the peak. Whether the peak occurred in late 2000 or early 2001 remains to be seen. Our resulting samples have between 280,000 and 360,000 observations for the 12-month periods that serve as beginnings or ends of the cycles.

The CPS ORG data are not available for the 1960s. For this period, we use the March CPS data from March 1962 (which has annual earnings data for 1961 and is the earliest available CPS data) and March 1970 (which has annual earnings data for 1969).[6] These data are more limited, both in sample size and in variable detail. They also bracket only the expansion and do not adequately describe the entire cycle. Hence growth rates reported during the 1960s are larger than we would see if the entire cycle were included in the data.

In short, we focus on data comparisons between 1961 and 1969, 1979-80 and 1990, and 1990 and 1999. The 1960s brackets nine years of expansion, the 1990s brackets a 10-year cycle and the 1980s brackets an 11-1/2 year cycle. We report aggregate changes over these periods and do not adjust the data for different period lengths. Thus, we are understating the strength of the 1990s cycle relative to the 1980s cycle, both because we are truncating it before its peak and because we are reporting aggregate growth rates that are cumulated over a shorter number of years.

The ORG data provide information on employment, hours of work last week, and earnings last week. We deflate nominal earnings to 1999 dollars with the monthly personal consumption expenditures price index. To calculate annual earnings, we impute weeks of work to each individual observation, based on the average weeks of work over the year within their relevant subgroup (defined below). Mean weeks are calculated from the closest March CPS.[7] We can convert these individual data into economy-wide or group aggregates by adding them up, weighted by the relevant population weights.

While we are interested in the decomposition (introduced in the previous section) of aggregate earnings among all workers, we are also interested in the contributions of specific groups in the population as well. We analyze the contribution to growth in each of the components of earnings discussed in the previous section for the following groups:

- Sex (male; female)
- Race (Hispanic; non-Hispanic black; non-Hispanic white; non-Hispanic other)
- Age (16 to 29; 30 to 49; 50 and older)
- Education (no high school degree; high school degree only; more than high school, less than college; college degree or higher)
- Marital status (not married, no children; not married with children; married, no children; married with children)
- Region (Northeast; Midwest; South; West)

B. Productivity and capital data

The CPS data, of course, have no information about the output of workers' firms or their capital stock. In order to examine output, productivity, and capital by types of workers, we map industry-level data into the CPS data. Our basic procedure assigns the industry-level data to individual workers according to their industry and then constructs the relevant aggregates by demographic or occupational group. This procedure clearly glosses over heterogeneity of workers within industries, but it is the best that can be done using readily-available, published statistics.

The Bureau of Economic Analysis (BEA) provides data on output, labor input, and capital stocks on a consistent basis at the roughly two-digit SIC level. To map these data into our sample, we have the option of assigning BEA output and dividing by workers in the CPS or directly assigning BEA output per worker (productivity) to individual workers in the CPS. We

chose the latter approach because we felt it was better to measure the numerator and denominator of productivity from a consistent data source. Specifically, we take the ratio of BEA's real gross product originating (value added) to BEA's measure of persons engaged in production (i.e., full-time equivalent employees plus the self-employed). Each individual observation in our CPS sample is assigned a productivity based on productivity in their industry in the specific year. When we calculate output, these productivities are scaled by individuals' hours of work.[8] For the capital stock calculations, we assign BEA's industry estimate of the real net stock of capital per full-time equivalent worker to each worker in the CPS sample.

III. The Composition of Earnings Growth Across Three Cycles

In this section, we examine earnings growth and its components across the cycles of the 1960s, 1980s, and 1990s using the data from the Current Population Survey. We also examine the contribution of different groups to growth in earnings and its components.

A. Aggregate changes

Figure 1 shows the growth in aggregate annual earnings over the cycles of the 1960s, the 1980s, and the 1990s and its decomposition. As shown in the rightmost set of bars, earnings grew 46 percent in the expansion of the 1960s, but less than 30 percent during the 1980s and the 1990s cycles. The other sets of bars in the figure show the four components of earnings growth using the decomposition in equation (4). Population growth is very important in all decades and explains 28 percent of the 1960s earnings expansion (13.0/45.6), 45 percent of the 1980s expansion and 37 percent of the 1990s expansion. Growth in employment explains a relatively small share of the 1960s and 1990s annual earnings growth, but a larger share during the 1980s

cycle. Growth in the intensive margin, weeks worked, is minor over all three cycles. Hence, the peak-to-peak growth rate is doing a good job of abstracting from cyclical factors.

Growth in earnings per week is the most important component of annual earnings growth in the cycles of the 1960s and the 1990s. The 1960s saw particularly high earnings per week growth, explaining over 60 percent of the growth in total earnings and driving the higher annual earnings growth rates during that decade. Growth in earnings per week constituted just over half of the annual earnings growth in the 1990s, but only 32 percent of annual earnings growth in the 1980s, reflecting much more sluggish wage growth over that decade.

The 1990s cycle produced a sustained decrease in the unemployment rate. Well into the 1990s, most forecasters presumed that an unemployment rate of about 6 percent corresponded to full employment. Since the mid-1990s, the unemployment rate has fallen about 2 percentage points to around 4 percent with only a modest increase in inflation. Assuming that the decline in unemployment was entirely matched by an increase in employment, we can calculate how much additional growth occurred in employment rates. This additional employment growth is a measure of the extent to which non-labor market participants were drawn into the labor market during these cycles. The results shown in Table 1 suggest that the decline in unemployment explained over half of employment growth in the 1990s, but less than 20 percent of the employment growth in the 1980s, reflecting high unemployment rates throughout that decade. Additional labor force growth was stronger in the 1960s and the 1980s than in the 1990s. Much of this difference reflects higher growth in female labor force participation in these earlier decades. Other papers in the volume examine this decline in the unemployment rate. Since our results shed little light on the matching process for workers and jobs, we can say little about whether this decline in unemployment is sustainable.

B. Changes by demographic group

A key question for any expansion is who is most contributing to and benefiting from the growth in earnings and productivity? Some groups may receive a disproportionate share of the population growth, the employment share growth, or the earnings per week growth. In this section we examine how aggregate earnings growth is split among different groups in the population. We focus here on a comparison of the 1980s and the 1990s; the patterns in the 1960s are generally similar. A full set of results for each decade is available in the Appendix Tables.[9] We show summary information in the figures presented here.

Figure 2 shows annual earnings growth and its components, and separates the contributions of men and women. As in Figure 1, the rightmost bar shows the growth in annual earnings while the first four bars show the decomposition of earnings into its four components. Each of these bars is divided into two shaded areas that show the contribution of men and women to growth in each component. The share of men and women's contribution to growth in the component is noted to the right of the bars. The first four bars sum to total earnings growth, shown in the fifth bar. The contributions of each group to each component likewise sum to the total growth for that component. Figures 3 through 8 have the same structure for different subgroups in the sample.

Not surprisingly, Figure 2 shows that the contribution from population growth to total earnings is equally split between men and women in both expansions. On the other hand, almost all of the growth in employment rate occurred among women. Women contributed about half of the growth in earnings per week in the 1980s, and only 31 percent in the 1990s. The net result, shown in the rightmost bar, is that women contributed 56 percent of the annual earnings growth in the 1980s and 42 percent in the 1990s.

Table 2 provides further context for these results and shows initial population share and weekly earnings levels, as well as growth rates in each of the components of annual earnings. The contribution to aggregate annual earnings growth of men and women, shown in the rightmost bar in Figure 2, is affected by the initial male/female population ratio, differential growth rates in each component, and different starting levels in each component. For instance, although men capture a higher share of weekly earnings growth (69 percent in Figure 2B) over the cycle of the 1990s, their growth rate in earnings is less than that of women (14 percent versus 16 percent). Their higher overall share of earnings growth owes to their much higher starting level of weekly earnings ($502 versus $340). Table 2 also demonstrates how very unusual the high female contributions to earnings growth (shown in Figure 2) were in the 1980s. Women capture almost half of the growth in weekly earnings and more than half of the overall growth in annual earnings. Women's far lower weekly wage levels are offset by their very high levels of employment growth and weekly earnings growth. In both decades, women's annual earnings growth was disproportionately due to their relatively larger increases in employment, while men's annual earnings growth was disproportionately due to their increases in weekly earnings.

Figures 3A and 3B provide a similar picture for the 1980s and 1990s expansions for non-Hispanic whites, non-Hispanic blacks, Hispanics, and other non-Hispanics (largely persons whose background is Asian or Pacific Islander). In both decades, the growth in annual earnings among the three non-white groups (shown in the final column of Table 2) is larger than their initial population share (shown in the first column of Table 2).

Among Hispanics, the vast majority of their total earnings growth in both decades is coming from population growth. Around a third of total population growth in both decades is due to growth in the Hispanic population. Blacks and non-Hispanic others also had

disproportionately high population growth, indicating the growing diversity in the population as the share of non-Hispanic whites declined. In contrast, whites contribute a vastly disproportionate share of the earnings per week growth in both decades relative to their population share. Table 2 shows that much higher starting wage levels among white workers, combined with high growth rates in weekly wages among white workers, account for their disproportionate share of earnings growth. In summary, the annual earnings gains to white workers were disproportionately coming from wage increases among these workers; the gains among non-white workers were disproportionately coming from population growth and (to a lesser extent) employment share growth.

Figures 4A and 4B decompose the expansions of the 1980s and 1990s by education level. Workers with college degrees or graduate education account disproportionately for the expansion in annual earnings. Although they are only 19 percent of the population in 1990 and only 14 percent in 1979-80, they contribute more than two-thirds of the growth in earnings per week during both cycles and almost two-thirds of the growth in annual earnings. Annual earnings gains among workers with some college result largely from growth in population and the employment rate. Those with a high school degree or less are shrinking as a share of the population in both decades and are responsible for very small shares of the growth in annual earnings. Table 2 indicates that this is both because those with less education have much lower starting wages and much slower wage growth over these two decades.

Figures 5A and 5B provide the results by age. Over these two expansions, the baby boom is moving from ages 18-33 (in 1980) to ages 37-52 (in 1999). The importance of the baby boom is clearly apparent in the figures. Figure 5A indicates that 92 percent of the population growth over the cycle of the 1980s comes from growth in the population aged 30-49. In the

1990s cycle, population growth is split evenly between the 30-49 year olds and those older than age 50. In both decades, the middle age group, which is dominated by the baby boom cohort, exhibits the largest gains in earnings per week and in annual earnings, although by the 1990s the over-50 group is receiving a growing share of annual earnings gains.

Figures 6A and 6B show the results by family status. (The data on children are not available in the ORG data during the 1980s.) In the 1990s, married persons with and without children are responsible for a disproportionate share of the increase in annual earnings, largely because of their much higher starting wage levels (see Table 2). Those who are single with children experienced very large employment and population gains in the 1990s, but their small starting share of the population and their low earnings levels meant that their share of aggregate earnings growth was small. This finding is consistent with other evidence showing that employment rates among single mothers have increased rapidly over the past decade (Blank and Schmidt, 2001).

Finally, Figures 7A and 7B decompose earnings growth by the four Census regions. In the 1980s, the West contributes a high share of annual earnings growth, largely because of greater population growth. In the 1990s, the West is still exhibiting much higher population growth, but it receives a smaller share of the growth in weekly earnings. These two effects offset each other. The Northeast contributes a relatively small share of annual earnings gains in the 1990s, while the south gains a great deal.

IV. Quantity of Labor: A Closer Look

Figures 2 through 7 clearly show that both population growth and employment rate growth within the population have played an important role in increasing total earnings and

productivity. This finding appears to be particularly true among less skilled and lower wage workers. In the cycles of both the 1980s and the 1990s, a disproportionate share of growth in earnings among more disadvantaged workers came from population and employment growth rather than from weekly wage growth. In this section we explore these changes in labor quantity more closely.

A. Age distribution

As figures 5A and 5B make clear, the age distribution of the population has been an important contributor to the increase in earnings. The baby boom bulge in both the 1980s and the 1990s was primarily situated in the 30 to 50 year age range, an age when many persons work steadily and reap real wage increases due to their growing experience. But even putting wage increases aside, this group experienced disproportionately large population and employment share growth in both expansions.

As this population ages, we may have stronger offsetting effects as aging workers start reducing their employment share and perhaps accept lower real wages. These effects are already visible among the current over-age-65 population. In both the 1980s and 1990s, population growth was strong among those over age 65, but their share of employment growth and of weekly earnings growth declined in both cycles. The net effect is that the over-65 population contributed almost nothing to the growth in annual earnings in either of these cycles.

Offsetting the negative effects of an aging baby boom are several other factors. First, the baby boom echo is as large a cohort as the baby boom itself was, and will be moving into their prime earning years over the next several decades. Second, continued work and earnings among many in the baby boom generation may be possible. Wage levels among those over 65 have actually grown strongly during the past two decades. In addition, employment among older

workers has been rising recently. Table 3, which shows labor force participation rates by sex, education level, and age over the past three decades, indicates that the downward trend in labor force participation of individuals aged 65 years and above ceased in the 1990s, and even reversed for women. There has also been a notable increase over the last decade in labor force participation among individuals ages 50-65. This increase in labor force might be sustainable, especially with increases in health and longevity. The very low levels of unemployment surely have facilitated it in recent years.

B. Labor force participation changes within demographic groups

As we have seen, growth in employment rates has been an important component of earnings growth. In this section, we ask how much of this change is due to changes in labor force participation. Table 3 indicates that female labor force participation rates increased from 49 percent to 72 percent between 1969 and 1999. The pattern of increase among different groups has varied over time, however. More skilled women showed strong increases in the 1970s and 1980s, but their participation has leveled off at around 82 percent over the 1990s. Less skilled women, whose labor force participation was almost flat in earlier decades, have experienced strong labor force participation growth in the 1990s. This trend has been correlated with economic growth, with welfare reform, and with expansions in the minimum wage and the Earned Income Tax Credit (see Blank and Schmidt, 2001).

In contrast, overall men's labor force participation has declined slightly over these decades. This decline is most noticeable over the 1970s among less skilled men. Labor force participation among more skilled men has been essentially flat over these decades. With earlier retirement, older men have also shown a marked decline in labor force participation.

Most of the recent growth in labor force participation has clearly come from women. If one takes men's labor force participation rates as the highest rate potentially attainable by women, then there is still some room for labor force participation growth among women, but much less than there has been in the past. If one believes that women's labor force participation rates are likely to be somewhat below men's because of child-bearing as well as social norms and marital sorting, then there may be little room for substantial labor force participation increases in the next few decades. The lack of growth in labor force participation among more skilled women over the expansion of the 1990s may be an indication that at least these women are not likely to experience further employment rate increases. In more disaggregate data, the group with the greatest potential to experience large labor force participation increases are Hispanic women, who tend to have lower skill levels and participate at a much lower level than other women. Hispanic women are only 5 percent of the adult population, however, so that even large increases in their labor force participation are not likely to increase overall labor force participation greatly.

In general, we believe that the potential for increased labor force participation as a significant component in future economic cycles is more limited than it has been in the past, largely because we do not expect women's labor force participation rates to expand substantially in future decades. If female labor force participation had not increased in recent decades, this would have shaved almost 5 points off the growth rates in annual earnings in the 1980s, and almost 2 points over the growth rates in annual earnings in the 1990s.

It is an interesting question whether the decline in men's labor force participation is permanent. To the extent that it is connected to more extended years of schooling and earlier retirement, it is likely to be permanent. To the extent that it reflects deteriorating labor market

conditions among less skilled men, this group may increase work effort if wages among the less skilled rise in the future. But these effects are likely to be small.

C. Immigrants

The last two decades have seen high immigration rates to the United States. We can investigate how much these immigrants have spurred growth in aggregate earnings. The 1999 ORG CPS data explicitly ask respondents if they immigrated between 1990 and 1999. We take this as a rough measure of immigration over the cycle of the 1990s. Population growth over the expansion was 19.7 million; immigration was 8.5 million, indicating that 43 percent of the population growth was due to immigration. The effects over the 1980s were of a slightly smaller magnitude, with 32 percent of the 12.2 percent growth in population due to immigration.[10]

One might assume that immigration affects not just population growth, but other categories in our decomposition as well, particularly if immigrants are disproportionately employed or experience lower real wage growth. Table 4 presents the decomposition for the 1990s if all those who report immigrating over that decade were removed from the data. This calculation quantifies the direct impact of immigrants. It completely abstracts from changes in employment and wages of non-immigrants that would results if there were no immigration. Net of immigration, earnings growth in the 1990s would have been 23.8 percent rather than 26.9 percent, all other things equal. This large effect is mainly due to the increased population growth resulting from immigration, which is slightly offset by the fact that immigrants earn substantially lower wages than non-immigrants.

D. Armed forces

Our calculations are based on the civilian population. Since the last two decades have seen a substantial reduction in the size of the armed forces, it is worth investigating what the

effect of this reduction is on civilian earnings. We can produce a rough, upper bound estimate by calculating how much smaller the military was in 1999 versus 1990 and assuming this number was added to civilian employment. Between 1990 and 1999, the size of the armed forces fell by over a third. In the absence of this change, civilian population would have grown only 9.5 percent rather than 10.0 percent. The civilian employment-to-population rate would have grown only 2.2 percent rather than 2.4 percent. The net effect is that aggregate earnings would have grown only 26.2 percent rather than 26.9 percent if armed forces size had stayed constant. Over the 1980s, the effect is slightly smaller. These are not large effects.

Our overall assessment in this section is that several population trends, including increased female labor force participation, high immigration, and the age distribution of the population, have helped raise growth rates over the past two decades. If these trends shift in upcoming decades, this will limit the growth potential of future expansions.

V. Wages and Their Distribution: A Closer Look

In most cycles, one of the largest sources of growth in annual earnings is growth in weekly wages. This section explores changes in wages and annual earnings in more detail. Sustained increases in wages due to increases in technology and capital accumulation unambiguously increase economic wellbeing, in contrast to increases in annual earnings due to longer hours of work, higher employment rates, or rising population.

A. Comparing the early and late expansion in the 1990s

Other evidence indicating that wage patterns post-1995 were different than pre-1995 suggests that it might be interesting to examine a comparison of patterns in the first versus the second half of the cycle. Figure 8 presents the contributions to earnings growth and its

components from 1980-86 and 1986-90 (Figure 8A) and from 1990-95 and 1995-99 (Figure 8B). These data indicate very clearly that the expansion in the first half of the 1990s was relatively sluggish. Only 28 percent of the annual earnings growth between 1990 and 1999 occurred in the first five years. Furthermore, there was very little growth in real weekly earnings over this time period. It is only after 1995 that the expansion really booms, with strong growth in real weekly wages and in employment growth rates as well. In contrast, the expansion of the 1980s was more evenly spread over all years. Weekly earnings grow only slightly less between 1980-86 (which includes 4 years of expansion) than between 1986-90, while annual earnings grew slightly more during these earlier years. We return to this issue below when we discuss other productivity measures and show how the timing of annual earnings growth diverges from growth in productivity and capital over the 1990s.

B. Earnings inequality

During the 1980s average wage growth was an inadequate descriptor of wage changes. Decreasing wages at the low end of the wage distribution and increasing wages at the high end led to increases in inequality. Evidence suggests that these trends continued through the mid-1990s, but around 1995 wages started to rise even among the less skilled population (Council of Economic Advisers, 1999). Wages continued to rise among the more skilled as well, however, so wage inequality is not likely to have fallen over the 1990s.

Table 5 shows the share of annual earnings by quintile of the earnings distribution at the beginning and end of the expansions of the 1980s and the 1990s; the last column shows the share of annual earning growth within each quintile. If a quintile captures the same fraction of annual earnings growth as its share at the beginning of the cycle, then its share will not change. As it

turns out, quintile shares are shifting in similar ways across both decades in Table 5, with ongoing widening inequality.

While the shares of earnings by quintile do not change rapidly, the shares of growth in annual earnings experienced by those at the top and the bottom of the distribution are markedly different, with the top 20 percent enjoying around 50 percent of the annual earnings growth over each of these expansions, while the bottom 20 percent captured only four percent of the increase. In both decades, the share of annual earnings in the bottom four quintiles falls while the share of the top quintile rises. The data discussed above indicate that sources of aggregate earnings growth were quite different among the top versus the bottom of the earnings distribution, with growth at the bottom coming largely from population and employment rate increases while growth at the top came from real wage increases.

These data suggest that earnings inequality widened over the 1980s and over the 1990s by about the same amount. The 1980s may have felt different for low-wage workers since widening inequality occurred along with falling wages, while in the latter part of the 1990s wages rose among the less-skilled. This stronger wage growth among more disadvantaged workers did not help these workers make gains in their share of earnings, however.

VI. Earnings, Productivity, and Capital Accumulation

A. Balanced growth?

The previous sections document substantial growth in earnings during the sustained expansions of the 1980s and 1990s. They decompose this growth in earnings into growth in the quantity of labor – population, employment rates, and intensity of employment – and growth in the rewards to labor – the wage rate. This increase in the wage rate is the dual of the increase in

labor productivity. Labor productivity, however, will grow at the rate of technological progress only if the growth in technology and labor input is accompanied by the warranted amount of capital accumulation. Specifically, if the economy is close to steady state, we should expect to see capital increasing at the $n + g$ rate of growth to balance increases in labor and technology. Otherwise, diminishing marginal product may attenuate the growth in output and earnings.

The boom of the 1990s is distinguished by the high and sustained level of investment that accompanied it. Unlike the booms of the 1960s and 1980s, the pace of investment relative to total output remained high late into the expansion (see Basu, Fernald, Shapiro, 2000). If this rapid pace of investment pushed the capital stock ahead of its steady-state value, the return to labor might be temporarily high. On the other hand, as discussed in Section I, the second half of the 1990s did see an increase in the rate of technological progress. This acceleration in technology requires a more rapid growth of the capital stock in steady state, so the acceleration of investment may be the response to the improved prospects for long-run growth.

In this section, we ask whether the economy appears to be approximately in steady state. Figure 9 addresses this issue by comparing the growth in real annual earnings from our CPS data and the growth in real value added and real capital from the BEA data (reaggregated as described above). Though fundamentally an aggregative comparison, matching the BEA industry-specific data with our CPS sample gives us comparable measures in these three categories. Strikingly, for both the 1980s and the 1990s, real aggregate earnings grow at a rate that is very close to the rate of growth in real value added output. Both of these in turn grow at a rate similar to the growth in capital stock. This result suggests that the earnings increases experienced in both the 1980s and the 1990s were sustainable at the rate of technological progress.[11] In contrast, the 1960s show much greater earnings gains than either the growth of value added or the capital

stock growth would justify. Such an increase might have been caused by an increase in labor's bargaining power or by an increase in wages in anticipation of future gains in productivity. In any case, it did turn out that the 1960s growth rate of earnings was not sustainable. Had technology and capital accumulation in the 1970s caught up with the earnings growth of the 1960s, the earnings growth might have been sustained. But the slowdown in the pace of technological change in the 1970s is a well-known tale. The non-steady-state outcome exhibited in the 1961 to 1969 columns of Figure 9, taken together with the productivity slowdown of the 1970s, is perhaps part of the explanation of the 1970s stagflation.[12]

Figure 8, discussed above, shows that earnings accelerated in the second half of the 1990s. Figure 10 compares the time path of earnings to that of output and capital over the 1980s and 1990s. During the earlier more sluggish part of the 1990s cycle, real earnings gains lagged behind gains in real output, and both lagged gains in capital stock. In the second part of the cycle, however, these patterns are reversed. Since 1995, earnings gains have outstripped output gains and output gains have been larger than capital stock gains. Figure 10 provides a further explanation for the strong boom of the late 1990s in earnings growth by suggesting that workers were (with a lag) reaping the rewards of growth in the capital stock.

While Figures 9 and 10 show data for the entire economy, we can calculate similar data for any of the demographic subgroups that we examined in Figures 2 through 7. Recall that these attributions of capital are less reliable than the aggregate or industry-specific figures because they assume all workers in an industry are equally productive. Hence, we relegate them to the appendix tables, where we show changes in average capital per week worked by subgroup.

Turning first to the industry-specific data, where capital is accurately assigned, the $\Delta(Q/K)$ column of Appendix Table 2c shows substantial heterogeneity in capital deepening in

the 1990s. In most of the services in the 1990s, the capital-output ratio is increasing (i.e., negative numbers in the last column of the table). There is no reason to expect capital-output ratios to be constant industry-by-industry. This fact fits "new economy" stories based on capital/skilled-labor complementarities (see Hall, 2000). There appears to be relatively strong capital deepening in trade, business, and legal and professional services, but not in telecommunications and utilities. The 1980s (Appendix Table 2b), however, show similar patterns, so if these facts are indicative of a change in technology, it has been ongoing for longer than the late 1990s.

There are some interesting findings by demographic groups. Female employment grew in capital-intensity (K/W) at a higher rate than male employment in the 1990s. The 1980s saw even a larger disparity. This mainly reflects women moving into highly capital-intensive industries traditionally occupied by men and it reflects the increased capital intensity of services, where women have a greater employment share. The trend toward equalization of capital-labor ratios by sex is part of the long-term trend toward increasing similarity in women and men's labor-market activities.

There are also interesting patterns by race. In the 1990s, rates of capital deepening were somewhat greater for whites than for others. In contrast, the 1980s saw greater capital deepening among blacks than among whites, but a very low rate for Hispanics. These findings indicate slow and uneven convergence of labor-market outcomes across the races.

The most striking result among these demographic groups is the rapid growth in the capital intensity of industries that employ highly educated workers relative to less educated workers. In the 1990s, the capital per week of work among the highest educated workers grew by 34 percent; among college graduates it grew at 14 percent. For workers with high school

degrees and dropouts, the increases were 9 or 10 percent. These results parallel those of Hall (2000), who emphasizes the complementarity of highly-educated workers and new investments. Moreover, if within-industry heterogeneity is similar to across-industry heterogeneity, these results understate the changes in capital-intensity across educational groups. Note, however, that the positive correlation between educational attainment and capital deepening is not only a feature of the 1990s. The pattern is even stronger in the 1980s, when the capital-intensity of jobs worked by high school dropouts actually fell. Hence, the differential capital deepening by education level does not appear to be a distinct feature of the 1990s or the "new economy," but instead a concomitant force with the increasing skill-intensity and increasing wage-inequality seen since the 1980s.

B. Are workers moving into high productivity industries?

Reallocation of workers across industries can be an important source of increased productivity. It might be especially important when the economy is undergoing structural changes, e.g., these reallocations might be related to the increasing importance of information technology.

In this section, we decompose productivity growth into that due to workers shifting among industries with different levels of productivity and that due to different productivity growth rates within industries. There are a number of ways to carry out this decomposition. Table 6 presents one such decomposition for the expansions of the 1990s and 1980s. As with capital, we attribute productivity to individual workers according to the value for their industry. The first row is the actual growth in productivity (output per week). The other two rows consider counterfactuals.

The second row gives the growth in output per week where workers at the end of the expansion are assigned the beginning of expansion level of productivity, that is, the effect on the level of productivity coming solely from the reallocation of workers across industries. Hence, the –2.1 percent value for all workers during the 1990s means workers on average moved into industries that had relatively low productivity at the beginning of the decade.

The third row assigns productivity to workers at the end of the expansion as if their industries' productivities had grown at the average rate rather than at their actual rates. Hence, the fact that this counterfactual growth rate of 11.8 percent for all workers in 1990s is lower than the actual growth rate of 15.0 percent implies that workers in the 1990s switched into faster growing industries. To summarize, the typical worker in the 1990s moved to an industry with slightly lower productivity levels at the beginning of the cycle, but was more than compensated for this by rapid productivity growth in these industries. This pattern does suggest the importance of industrial reallocation for growth in the 1990s.

Table 6 shows the opposite pattern for the 1980s. On average, workers shifted to industries with high initial productivity; overall productivity would have grown 4.0 percent due to this reallocation alone. They shifted, however, to industries with slower than average growth; the actual 10.0 percent productivity growth is less than the 16.5 percent productivity growth workers would have experienced with uniform growth in all industries. Hence, in the 1980s, industry reallocation did not contribute to productivity growth.

Appendix Table 1c makes clear that both output and productivity growth are particularly strong in durable manufacturing, telecommunications, and finance, insurance, and real estate. These industries are closely linked to the "new economy," through the production or use of information technology. Nordhaus (2000) makes the same observation. Hence, we see not just

high productivity growth in some industries, but a high share of output concentrated in these industries as well. High productivity growth and high output growth need not lead to an increase in employment. Indeed, employment (sum of the first two columns in Table 1c) fell in durable manufacturing during the 1990s, though it rose considerably in the telecommunications and service sectors.

VII. Summary and Conclusions

The 1990s were a period of remarkable economic expansion. The unemployment rate returned to the low levels of the 1960s while inflation remained in check. During the second half of the decade, the pace of productivity change increased substantially – equaling the peak rates of productivity change experienced during the whole post-World War II period. This superb economic performance took place in the context of a booming stock market and sustained high levels of fixed investment, especially in information technology equipment.

The shift in the composition of investment toward information technology, the run up of stock market values, especially for companies in technology-creating industries, and the increased rate of technological change together could signal a distinct shift in the structure of production and demand, that is, a "new economy." What lessons do our research provide for assessing the claims for a "new economy" based on the performance of the labor market? We do find substantial evidence of changes in the labor market that suggest a transformation of the economy:

- Workers are shifting to occupations and industries with high output growth, often identified with the new economy.

- The capital intensity of work in these industries and occupations is increasing relative to average for the economy.
- A disproportionate share of capital accumulation is directed to workers with high levels of education attainment.
- These high educational attainment workers are also getting disproportionate increases in earnings per week.

While these findings appear consistent with a structural shift towards "new economy" employment, that interpretation is not supported by a longer view. With the exception of the first point, the same findings also characterize the expansion of the 1980s. Hence, while changes in the labor market facilitate a shift of production and demand to industries with new technologies, these changes are part of longer-term trends in the labor market rather than a distinctive break in the 1990s.

Other features of the expansion of labor input in the 1990s that affect the sustainability of growth are also related to longer-term developments in the labor market.

- The 1990s continued the convergence of the labor-market outcomes of men and women. Increasing female labor force participation is likely to be a less important source of growth in the future. (This accounted for two to five points in annual earnings growth over the cycles of the past two decades.) Similarly, women's experience, educational outcomes, and occupational choices are becoming more like men's, so closing this gap will become less important for wage growth. Convergence in labor market outcomes across races could have similar growth-enhancing effects in the future, but this is proceeding slowly and unevenly at present.

- The age distribution of the population placed the baby boom in its prime earning years over the cycles of the 1980s and 1990s, which contributed to aggregate earning and productivity growth. The negative effects of an aging population on future growth may not be large, however, as the baby boom echo moves into its prime earning years in the decades head. Ongoing higher labor force participation rates and earnings rates of today's baby boomers as they enter their 50s and 60s would also substantially reduce any negative effects.
- Immigration remains an important source of labor supply. Whether or not this trend continues depends heavily upon political support for open immigration policies in the face of a rising immigrant population share.
- There have been remarkable increases in employment over the 1990s among some groups, especially single mothers. Although these groups are small enough to have little impact on the aggregate, the shift in labor force participation has important implications for members of those groups.
- Skilled workers continue to be increasingly important for aggregate earnings growth, largely because of their continuing wage increases. Though the bottom of the income and skill distribution did better in the late 1990s than any time in the last twenty years, there was no decline in inequality because the top rose even faster. Future growth rates will depend upon continued strong wage growth among more skilled workers and/or the potential for future wage increases among the less skilled.

Our analysis leads us to believe that the U.S. labor force is well poised to sustain the gains in output and productivity seen during the current expansion. In part, these gains reflect population and labor force changes that represent long-term trends and not cyclical changes. In

part, they reflect earnings gains that are well supported by productivity gains and capital deepening.

Whether or not the U.S. economy can expect to repeat such stellar growth in the decades ahead is a little less clear.

- The increase in female labor force participation appears to reaching an end, except for some possible increases at the low end of the skill distribution.
- The baby boom generation is aging. Ellwood (2001) shows an increasing shortage of labor, especially of skilled workers.
- The drop in the unemployment rate to around 4 percent from what was thought to be a 6 percent natural rate may or may not be sustainable in the long run. If the current rates are temporarily low, some of the gains in employment, output, and earnings of the 1990s will be reversed.
- In some industries, notably manufacturing, hours of work are high relative to historical norms at the end of expansions. A return to more normal levels would lead to further reversal of some of the gains of the 1990s.
- A high rate of capital accumulation has accompanied the increase in technology and labor in the 1990s. A substantial amount of the saving to sustain this rate of investment has come from abroad. If this pattern were to reverse, either national saving would have to increase or growth in capital decline.

Finally, we note that distributional issues were as important in the 1990s expansion as in the 1980s expansion. The upper income quintile disproportionately gained over the 1990s, while the bottom four quintiles lost income share. Less skilled and low wage workers experienced substantial aggregate earnings gains, but these occurred more because of population and

employment growth rather than wage growth, a more ambiguous signal about increases in well-being. The ongoing growth in productivity, capital intensity, and returns to education among highly-skilled workers suggests that they will continue to reap disproportionate earnings gains in the years ahead.

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Notes

[1] Our use of weeks worked rather than hours worked as the intensive margin for employment is dictated by our judgment that these data are more accurate given our dataset and our measurement framework.

[2] When factors of production are diverted from production to adjustment, measured output can understate actual output. See Basu, Fernald, and Shapiro (2000).

[3] Gordon's view is that the increase in technological change witnessed in the late 1990s, though genuine, is not evidence of a technological revolution. Moreover, he argues that the burst in technology is mainly confined to the make, rather than the use, of information technology. Oliner and Sichel (2000) and Basu, Fernald, and Shapiro (2000), in contrast, find a substantial acceleration of technology outside of the IT-producing sector.

[4] Basu and Kimball (1997) argue that there is a correlation between observed intensity of work and potentially unobserved effort or factor utilization and that intensity of work is a sufficient statistic for the unobservables.

[5] The ORG data are collected among the outgoing rotation groups in the CPS in each month and include weekly wage information (which is not available for other persons in the CPS sample). We combine the ORG monthly samples to create annual samples. A data appendix is available from the authors upon request that describes in detail how all of our data are coded.

[6] The trough and peak of the 1960s expansion were February 1962 and December 1969. The previous peak was April 1960, before the CPS data are available.

[7] Since we only report earnings at the subgroup level, imputing mean weeks of work within each subgroup should not induce error.

[8] Full-time hours are defined by industry, so a worker who reports 30 hours of work per week in an industry whose average hours are 40 hours per week would be assigned output equal to 0.75 (30/40) of that industry's average output per full-time equivalent worker.

[9] Appendix Tables 1a through 1c show share-weighted growth rates by population subgroup (i.e., the contribution of each group to aggregate growth, the same data used in Figures 1 through 7). Appendix Tables 2a through 2c show growth rates by population subgroup (the data used in Table 2).

[10] These population data refer to persons aged 16 years or more. The CPS has no questions about immigration in the 1980s. We use the Census data from 1990 on the number of persons who report immigrating between 1980-90. This indicates that immigrant growth accounted for 3.9 percent of the overall 12.2 percent population growth.

[11] Recall that our earnings data are wages, not total compensation. In the 1980s, benefits increases ran substantially ahead of wage increases, so the 1980s would look somewhat less sustainable than the 1990s if we were examining total compensation.

[12] Another source of deviation between earnings growth and output growth is differential growth rates in GDP prices and consumption prices, i.e., a deviation of the product wage from the consumption wage. This will arise because GDP is less service-intensive than consumption and the relative price of services is increasing. See Bosworth and Perry (1994) and Shapiro (1994). Note, however, that this phenomena goes the wrong way as an explanation of the 1960s and that Bosworth and Perry find it has been a relatively steady factor for the post-war period.

Table 1

Growth in Employment Rate

	1961-69	1980-90	1990-99
Total growth in employment/population	4.8%	4.8%	2.4%
Growth due to decline in unemployment	1.6	0.9	1.4
Additional growth in employment rate	3.2	3.9	1.0

Table 2

Components of Growth in Earnings
A: 1979-80 to 1990

	Initial Share of Population	Initial Level of Earnings Per Week in 1999 Dollars (Y/W)	Growth Rates: Population Δ(N)	Employed / Population Δ(E/N)	Weeks Worked / Employed Δ(W/E)	Earnings / Weeks Worked Δ(Y/W)	Annual Earnings Δ(Y)
Total	1.00	391	12%	5%	2%	9%	27%
Male	0.47	482	13	-2	3	4	18
Female	0.53	275	12	13	1	20	46
White (Non-Hispanic)	0.82	402	7	5	2	10	24
Black (Non-Hispanic)	0.10	330	19	5	4	5	33
Hispanic	0.05	335	53	6	-1	3	61
Other (Non-Hispanic)	0.02	381	49	-1	7	11	65
Age Less than 30	0.34	319	-7	4	3	1	2
Age 30 to 49	0.32	469	32	6	1	7	46
Age 50 or More	0.34	405	0	2	0	5	6
Northeast	0.23	398	4	6	1	18	28
Midwest	0.26	396	3	4	2	3	13
South	0.32	367	19	5	3	7	33
West	0.19	415	22	4	1	8	35
High School or Less	0.66	334	0	1	3	-2	2
Some College	0.19	396	27	5	1	5	38
Bachelors or More	0.14	587	39	2	0	13	54
Married	0.61	439	6	5	2	8	21
Not Married	0.39	315	21	5	3	13	42

B: 1990 to 1999

Total	1.00	427	10%	2%	0%	14%	27%
Male	0.48	502	11	0	1	14	25
Female	0.52	340	9	5	0	16	31
White (Non-Hispanic)	0.78	446	4	2	0	16	22
Black (Non-Hispanic)	0.11	347	14	7	-1	17	37
Hispanic	0.08	348	41	3	2	7	53
Other (Non-Hispanic)	0.03	428	45	3	1	14	63
Age Less than 30	0.28	323	0	-1	-1	5	3
Age 30 to 49	0.39	507	13	2	1	13	28
Age 50 or More	0.33	419	14	10	0	20	44
Northeast	0.21	475	2	1	2	9	14
Midwest	0.24	409	5	5	-1	19	28
South	0.34	396	13	3	-1	17	33
West	0.21	450	17	1	2	9	29
High School or Less	0.59	328	-3	1	0	7	6
Some College	0.22	417	24	0	1	8	33
Bachelors or More	0.19	672	27	-2	2	15	42
Married with Kids	0.28	491	4	3	1	17	25
Married without Kids	0.29	457	7	3	-1	16	25
Not Married with Kids	0.05	370	18	15	-1	13	44
Not Married without Kids	0.38	358	15	1	1	12	29

Source: Current Population Survey, Outgoing Rotation Groups
Based on civilian population, age 16 and over.
1979-80 refers to the period of July 1979 to June 1980.

Table 3

Labor Force Participation Rates
by Sex, Year, Education Level, and Age

	1969	1979	1989	1999
I. Women				
Total	48.6%	59.2%	67.7%	72.2%
By Education				
H.S. Dropout	41.6	43.7	44.5	50.3
H.S. Diploma	51.4	61.2	68.0	70.1
Some College	51.1	65.9	74.3	75.9
College Diploma	62.0	73.3	81.1	81.9
By Age				
16-25	47.7	60.7	61.2	61.9
25-49	48.0	63.1	74.1	77.3
50-65	45.6	46.2	50.2	59.2
>65	9.4	7.7	7.5	9.0
II. Men				
Total	89.4	87.2	86.3	85.3
Education				
H.S. Dropout	88.6	79.4	75.4	74.3
H.S. Diploma	93.2	90.7	88.2	85.5
Some College	85.6	87.2	86.9	84.7
College Diploma	91.2	92.8	92.3	91.5
Age				
16-25	62.1	70.8	69.2	64.7
25-49	94.3	93.6	92.2	90.7
50-65	85.9	76.7	72.1	74.4
>65	24.9	18.3	15.5	14.9

Source: March Current Population Survey data; based on labor force status in the week of survey.
All persons ages 20-65, except in specified age categories.

Table 4

Growth in Earnings Including and Excluding Recent Immigrants: 1990 to 1999

	Population Δ(N)	Employed / Population Δ(E/N)	Weeks Worked / Employed Δ(W/E)	Earnings / Weeks Worked Δ(Y/W)	Annual Earnings Δ(Y)
All civilians age 16+	10.0%	2.4%	0.4%	14.1%	26.9%
Excluding recent immigrants	5.8	2.6	0.4	14.9	23.8

Table 5

Share of Annual Earnings by Quintile and Annual Earnings Growth within Quintiles

Quintile	Quintile Share 1979-80	Quintile Share 1990	1980-90, Share of Annual Earnings Growth
Bottom 20%	5.5%	5.1%	3.9%
20-40	11.8	10.9	8.1
40-60	17.1	16.4	14.2
60-80	24.2	23.8	22.3
Top 20%	41.4	43.7	51.6

Quintile	Quintile Share 1990	Quintile Share 1999	1990-99, Share of Annual Earnings Growth
Bottom 20%	5.1%	4.9%	4.3%
20-40	10.9	10.5	9.2
40-60	16.4	15.8	13.7
60-80	23.8	23.2	21.3
Top 20%	43.7	45.6	51.5

Table 6

Productivity Growth: Effect of Reallocation Across Industries

	1979-80 to 1990	1990 to 1999
Actual	10.0%	15.0%
No productivity growth[a]	4.0	-2.1
Uniform growth rate[b]	16.5	11.8

Note: Productivity is measured as output per full-time equivalent employee as defined using BEA data reaggregated to match the CPS data as described in text.

[a] Growth in output per worker from shift in industrial composition holding productivity *level* equal to beginning of period levels.

[b] Growth in output per worker from shift in industrial composition holding productivity *growth* equal to base-period weighted average growth in output per worker.

Appendix: Table 1a
Share-Weighted Growth in Real Earnings and Capital: 1961 to 1969

		Population Δ(N)	Employed / Population Δ(E/N)	Annual Weeks Worked / Employed Δ(W/E)	Annual Earnings / Annual Weeks Worked Δ(Y/W)	Annual Earnings Δ(Y)	Capital / Annual Weeks Worked Δ(K/W)	Capital Δ(K)
	Total Population	**13.0%**	**4.8%**	**0.4%**	**27.5%**	**45.6%**	**14.9%**	**33.1%**
Sex	Male	5.7	1.7	0.5	25.3	33.1	12.6	20.5
	Female	7.3	3.1	-0.2	2.2	12.5	2.3	12.6
Race	White: (Including Hispanic)	11.1	4.4	0.5	25.1	41.1	13.4	29.4
	Black: (Including Hispanic)	1.7	0.5	-0.1	2.1	4.1	1.5	3.5
	Other: (Including Hispanic)	0.2	-0.1	0.0	0.2	0.4	0.1	0.2
Age	<20	3.0	-0.2	0.0	-1.3	1.4	-1.6	1.2
	20-29	5.6	2.7	0.2	3.2	11.8	2.0	10.5
	30-39	-1.1	1.5	-0.3	7.1	7.2	3.3	3.4
	40-49	1.0	1.4	0.2	9.0	11.6	4.8	7.4
	50-59	1.9	1.0	0.3	6.8	10.0	5.0	8.2
	60-65	1.0	0.0	-0.2	2.3	3.1	1.2	2.0
	>65	1.6	-1.7	0.2	0.3	0.5	0.2	0.4
Census Region	Northeast	2.7	1.1	0.0	6.9	10.6	2.3	6.0
	Midwest	3.6	1.8	-0.1	8.5	13.7	4.2	9.4
	South	5.3	1.7	0.4	7.6	15.0	5.1	12.5
	West	1.5	0.2	0.1	4.4	6.3	3.4	5.2
Schooling	No HS Diploma	-2.3	-0.6	0.1	7.8	5.0	0.8	-1.9
	Just HS diploma	7.8	3.4	0.0	8.3	19.5	5.3	16.4
	Some College/AA	4.7	1.0	0.2	4.1	10.0	2.5	8.4
	BA	1.8	0.4	0.1	4.8	7.1	4.1	6.5
	>=18 years, or >=Masters	1.0	0.5	0.0	2.5	4.0	2.1	3.6
Industry	Agriculture	-1.2	-0.9	0.1	1.9	0.0	2.1	0.2
	Forestry and Fisheries	0.0	0.0	0.0	0.0	0.1	0.0	0.0
	Mining	-0.1	-0.1	-0.1	0.2	-0.1	-0.2	-0.5
	Construction	0.3	0.6	-0.1	2.6	3.5	-0.7	0.2
	Durable Goods Manufacturing	2.5	1.9	0.2	6.0	10.5	-1.8	2.7
	Nondurable Goods Manufacturing	0.9	0.8	0.0	2.5	4.2	0.6	2.4
	Transportation, Communication, and Public Utilities	0.8	0.7	-0.2	2.7	4.0	5.6	6.9
	Wholesale Trade	0.0	0.1	-0.1	1.4	1.4	0.4	0.5
	Retail Trade	1.3	1.1	-0.6	2.4	4.2	-1.1	0.7
	FIRE	0.7	0.5	-0.1	1.7	2.8	1.9	2.9
	Business Services	0.4	0.3	-0.1	0.5	1.1	-0.3	0.3
	Repair Services	0.1	0.1	0.0	0.3	0.4	0.1	0.3
	Private Households	-0.5	-0.3	0.3	0.3	-0.1	0.4	0.0
	Hotels, Lodging, and Personal Services other than Private Household	-0.1	0.1	-0.1	0.0	-0.1	0.9	0.8
	Entertainment and Recreation	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1
	Hospitals	0.7	0.6	-0.1	0.4	1.6	-0.9	0.2
	Medical Excluding Hospitals	0.6	0.4	-0.2	0.0	0.8	-0.7	0.2
	Legal, Educational, Social, Religious, and other Professional Services	2.4	1.8	-0.2	2.4	6.3	7.1	11.1
	Public Administration (excl. Postal)	0.7	0.5	0.0	1.7	2.8	3.2	4.4
Marital	Never Married	5.3	-0.2	0.3	0.3	5.6	-0.2	5.1
	Married	5.7	5.4	0.1	25.3	36.5	14.1	25.3
	Widowed, Divorced, or Separated	2.0	-0.4	0.0	1.9	3.5	1.0	2.6

Within each population subgroup, each cell represents the subgroup's share of variable x multiplied by the subgroup's growth rate in variable x, where x is defined by the column heads. Unweighted growth rates are shown in Appendix Table 2a.

Source: March Current Population Survey

Based on civilian population, age 16 and over.

Appendix: Table 1b
Share-Weighted Growth in Real Earnings, Output, and Capital: 1979-80 to 1990

		Population Δ(N)	Employed / Population Δ(E/N)	Annual Weeks Worked / Employed Δ(W/E)	Annual Earnings / Annual Weeks Worked Δ(Y/W)	Annual Earnings Δ(Y)	Annual Output / Annual Weeks Worked Δ(Q/W)	Annual Output Δ(Q)	Capital / Annual Weeks Worked Δ(K/W)	Capital Δ(K)	Annual Production / Capital Δ(Q/K)
	Total Population	**12.2%**	**4.8%**	**1.8%**	**8.7%**	**27.4%**	**10.0%**	**28.8%**	**19.1%**	**37.9%**	**-9.1%**
Sex	Male	6.1	0.1	1.5	4.3	12.0	7.8	15.6	11.0	18.7	-3.1
	Female	6.1	4.6	0.4	4.1	15.1	2.2	13.2	8.1	19.2	-6.0
Race/Ethnicity	White (Non-Hispanic)	5.4	4.2	1.4	9.0	20.1	8.8	19.9	16.2	27.3	-7.5
	Black (Non-Hispanic)	2.0	0.3	0.3	-0.1	2.6	0.6	3.2	2.5	5.2	-1.9
	Hispanic	3.4	0.3	-0.1	-0.4	3.1	0.5	4.1	0.2	3.8	0.3
	Other (Non-Hispanic)	1.3	0.0	0.2	0.3	1.7	0.2	1.6	0.2	1.6	0.0
Age	<20	-1.7	0.1	0.6	0.4	-0.7	-0.1	-1.1	0.2	-0.9	-0.2
	20-29	-0.4	1.0	0.5	0.0	1.0	1.3	2.4	1.1	2.2	0.2
	30-39	6.3	3.3	0.3	3.0	12.8	3.4	13.3	6.6	16.5	-3.2
	40-49	5.0	2.8	0.2	4.7	12.6	3.2	11.2	7.3	15.2	-4.0
	50-59	-0.6	0.7	0.0	0.9	1.0	1.8	1.8	2.9	2.9	-1.1
	60-65	0.6	-0.4	0.0	0.1	0.3	0.5	0.8	1.0	1.2	-0.4
	>65	3.0	-2.7	0.2	-0.2	0.3	0.0	0.5	0.2	0.7	-0.2
Census Region	Northeast	0.9	1.3	0.1	4.2	6.5	2.5	4.8	4.9	7.2	-2.4
	Midwest	0.8	1.2	0.6	0.8	3.4	2.3	4.9	3.8	6.4	-1.5
	South	6.2	1.4	0.8	1.7	10.2	3.3	11.7	7.2	15.6	-3.9
	West	4.4	0.9	0.2	2.0	7.4	1.9	7.3	3.2	8.6	-1.3
Schooling	No HS Diploma	-4.9	0.4	0.7	-0.1	-3.9	1.7	-2.0	0.9	-2.9	0.9
	Just HS diploma	4.8	0.1	0.7	-1.1	4.5	2.6	8.3	4.6	10.3	-2.0
	Some College/AA	5.7	1.8	0.2	1.2	8.9	2.3	9.9	5.3	13.0	-3.0
	BA	4.0	1.6	0.1	5.0	10.8	2.9	8.7	5.9	11.7	-3.0
	>=18 years, or >=Masters	2.5	0.8	0.1	4.4	7.8	0.5	3.9	2.5	5.9	-2.0
Occupation	Executive, Administrative and Managerial Occupations	1.5	0.9	0.1	4.1	6.5	3.7	6.1	5.5	7.9	-1.8
	Professional Specialty Occupations	2.0	1.3	0.0	4.5	7.8	0.1	3.4	3.7	7.0	-3.6
	Technicians and Related Support Occupations	0.9	0.5	0.0	0.7	2.2	0.4	1.9	0.1	1.5	0.3
	Sales Occupations	3.5	2.0	0.1	-0.1	5.5	0.8	6.4	0.5	6.1	0.3
	Administrative Support Occupations, Including Clerical	1.1	0.7	0.5	0.4	2.7	-0.1	2.2	3.8	6.2	-3.9
	Private Household Service Occupations	-0.2	-0.1	0.2	0.2	0.0	0.1	0.0	0.1	0.0	0.0
	Protective Service Occupations	0.3	0.2	0.0	0.3	0.8	0.1	0.6	0.9	1.4	-0.8
	Service Occupations (excl. Private House & Protective)	1.6	0.9	0.2	-1.1	1.6	-0.9	1.8	-0.4	2.2	-0.5
	Farming, Forestry and Fishing Occupations	-0.2	-0.1	0.0	0.3	0.1	1.1	0.9	0.2	-0.1	1.0
	Precision Production, Craft and Repair Occupations	0.8	0.4	0.2	-0.6	0.8	2.0	3.4	2.0	3.4	0.0
	Machine Operators, Assemblers and Inspectors	-1.7	-0.7	0.3	0.1	-2.0	2.1	0.0	2.3	0.3	-0.3
	Transportation and Material Moving Occupations	0.3	0.2	0.0	-0.2	0.3	0.6	1.0	1.2	1.6	-0.6
	Handlers, Equipment Cleaners, Helpers, and Laborers	0.6	0.3	0.1	-0.6	0.4	0.0	1.0	-0.7	0.3	0.6
Industry	Agriculture	-0.1	-0.1	0.1	0.2	0.1	0.9	0.8	0.0	-0.1	1.0
	Forestry and Fisheries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mining	-0.1	0.0	0.0	-0.1	-0.3	0.6	0.5	1.6	1.5	-1.0
	Construction	0.8	0.4	0.2	-0.2	1.1	-0.6	0.8	-1.4	-0.1	0.8
	Durable Goods Manufacturing	-0.7	-0.2	0.2	0.9	0.3	3.7	3.0	2.5	1.8	1.2
	Nondurable Goods Manufacturing	-0.3	0.0	0.2	0.5	0.4	1.9	1.8	1.2	1.1	0.7
	Non-Specified Manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Transportation, Communication, and Public Utilities	0.5	0.3	0.1	0.7	1.6	2.6	3.5	6.2	7.1	-3.6
	Wholesale Trade	0.5	0.3	0.1	0.4	1.2	1.0	1.9	0.5	1.3	0.6
	Retail Trade	2.1	1.1	0.3	-0.9	2.6	-1.0	2.6	-2.3	1.2	1.3
	FIRE	1.2	0.7	0.1	1.9	3.9	4.2	6.2	8.9	11.0	-4.7
	Business Services	1.8	0.9	0.0	0.0	2.8	-0.4	2.3	-2.2	0.6	1.7
	Repair Services	0.4	0.2	0.0	-0.1	0.4	-0.2	0.4	-0.4	0.2	0.2
	Private Households	-0.2	-0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.0
	Hotels, Lodging, and Personal Services other than Private Household	0.6	0.4	0.0	-0.4	0.6	-0.5	0.5	-0.3	0.7	-0.2
	Entertainment and Recreation	0.3	0.1	0.0	0.0	0.4	-0.1	0.3	-0.4	0.1	0.3
	Hospitals	0.4	0.3	0.1	1.3	2.0	-0.6	0.1	-0.5	0.3	-0.1
	Medical Excluding Hospitals	0.9	0.5	0.1	0.3	1.8	-0.5	1.0	-1.1	0.3	0.6
	Legal, Educational, Social, Religious, and other Professional Services	2.0	1.3	-0.1	2.0	5.3	-1.4	1.9	3.2	6.5	-4.6
	Public Administration (excl. Postal)	0.5	0.4	0.1	1.3	2.3	0.1	1.1	3.3	4.4	-3.3
Family Structure	Never Married	4.0	1.2	0.9	0.6	6.8	1.1	7.3	1.6	7.8	-0.5
	Married	3.5	3.3	1.0	6.7	14.4	7.2	15.0	14.2	21.9	-7.0
	Widowed, Divorced, Separated, or Spouse Absent	4.7	0.2	-0.1	1.4	6.2	1.8	6.6	3.4	8.1	-1.6

Within each population subgroup, each cell represents the subgroup's share of variable x multiplied by the subgroup's growth rate in variable x, where x is defined by the column heads. Unweighted growth rates are shown in Appendix Table 2b.

Source: Current Population Survey, Outgoing Rotations Group
Based on civilian population, age 16 and over
1979-80 refers to the period of July 1979 to June 1980.

Appendix: Table 1c
Share-Weighted Growth in Real Earnings, Output, and Capital: 1990 to 1999

		Population Δ(N)	Employed / Population Δ(E/N)	Annual Weeks Worked / Employed Δ(W/E)	Annual Earnings / Annual Weeks Worked Δ(Y/W)	Annual Earnings Δ(Y)	Annual Output / Annual Weeks Worked Δ(Q/W)	Annual Output Δ(Q)	Capital / Annual Weeks Worked Δ(K/W)	Capital Δ(K)	Annual Production / Capital Δ(Q/K)
	Total Population	**10.0%**	**2.4%**	**0.4%**	**14.1%**	**26.9%**	**15.0%**	**27.8%**	**15.8%**	**28.6%**	**-0.8%**
Sex	Male	5.1	0.5	0.4	9.9	15.8	10.8	16.8	9.3	15.2	1.5
	Female	4.9	1.9	0.1	4.4	11.2	4.2	11.0	6.5	13.3	-2.3
Race/Ethnicity	White (Non-Hispanic)	2.9	1.5	0.3	12.8	17.6	12.2	17.0	13.2	18.0	-1.0
	Black (Non-Hispanic)	1.6	0.7	-0.1	1.1	3.2	1.5	3.6	1.7	3.8	-0.2
	Hispanic	3.7	0.2	0.1	-0.3	3.7	0.9	4.9	0.6	4.6	0.3
	Other (Non-Hispanic)	1.7	0.1	0.1	0.6	2.4	0.4	2.3	0.2	2.1	0.2
Age	<20	1.1	-0.4	-0.3	-0.2	0.2	0.3	0.7	0.1	0.5	0.2
	20-29	-1.2	0.1	0.2	1.3	0.4	2.4	1.5	2.4	1.6	-0.1
	30-39	0.1	0.5	0.2	3.8	4.7	3.6	4.5	1.8	2.7	1.8
	40-49	5.2	1.8	0.2	5.3	12.5	4.4	11.6	5.8	13.0	-1.3
	50-59	3.5	1.3	0.3	4.2	9.3	3.0	8.1	4.7	9.7	-1.6
	60-65	-0.4	0.3	0.1	0.4	0.5	0.6	0.7	0.5	0.6	0.1
	>65	1.6	-1.2	-0.1	0.0	0.4	0.4	0.7	0.3	0.6	0.1
Census Region	Northeast	0.4	0.2	0.4	2.0	2.9	2.3	3.2	2.3	3.3	-0.1
	Midwest	1.2	1.3	-0.3	4.7	6.9	4.7	6.9	4.4	6.6	0.3
	South	4.6	0.8	-0.2	5.4	10.6	5.8	11.0	6.4	11.7	-0.6
	West	3.7	0.2	0.5	2.1	6.4	2.2	6.6	2.6	7.0	-0.4
Schooling	No HS Diploma	-2.3	1.6	-0.4	0.5	-0.6	2.1	1.0	1.1	0.0	1.0
	Just HS diploma	0.9	-0.8	0.5	2.0	2.5	4.7	5.2	3.4	3.9	1.3
	Some College/AA	5.8	0.8	0.3	1.7	8.6	4.1	11.0	4.0	10.9	0.0
	BA	3.9	0.7	0.4	5.6	10.5	2.8	7.7	3.7	8.6	-0.9
	>=18 years, or >=Masters	1.7	0.3	0.1	4.7	6.8	0.9	3.0	3.1	5.2	-2.2
Occupation	Executive, Administrative and Managerial Occupations	2.4	1.4	0.0	5.3	9.1	4.0	7.8	4.1	7.8	-0.1
	Professional Specialty Occupations	2.6	1.4	0.1	4.8	8.9	0.2	4.3	3.5	7.6	-3.3
	Technicians and Related Support Occupations	0.2	0.1	0.0	0.4	0.8	0.5	0.8	0.3	0.6	0.2
	Sales Occupations	0.9	0.5	-0.1	1.5	2.9	3.1	4.4	0.8	2.2	2.2
	Administrative Support Occupations, Including Clerical	-0.2	0.0	-0.2	0.8	0.5	2.2	1.8	3.2	2.8	-1.0
	Private Household Service Occupations	0.1	0.0	0.0	0.0	0.1	0.0	0.0	-0.1	0.0	0.0
	Protective Service Occupations	0.3	0.1	0.0	0.2	0.6	0.1	0.5	1.3	1.7	-1.2
	Service Occupations (excl. Private House & Protective)	0.9	0.5	0.0	-0.2	1.2	-0.1	1.4	-0.3	1.1	0.3
	Farming, Forestry and Fishing Occupations	0.0	0.0	0.0	0.2	0.2	0.2	0.2	-0.2	-0.1	0.4
	Precision Production, Craft and Repair Occupations	0.3	0.4	0.1	1.1	1.9	2.5	3.4	1.8	2.6	0.8
	Machine Operators, Assemblers and Inspectors	-0.4	-0.1	0.0	0.6	0.1	1.7	1.2	1.1	0.7	0.5
	Transportation and Material Moving Occupations	0.3	0.3	0.0	0.2	0.7	0.6	1.1	0.6	1.1	0.0
	Handlers, Equipment Cleaners, Helpers, and Laborers	0.1	0.2	-0.1	0.1	0.4	0.6	0.8	0.2	0.4	0.4
Industry	Agriculture	0.0	0.0	-0.1	0.2	0.2	0.2	0.2	-0.2	-0.1	0.4
	Forestry and Fisheries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mining	-0.1	0.0	0.0	0.0	-0.1	0.3	0.2	0.4	0.3	-0.1
	Construction	0.5	0.5	0.0	0.4	1.4	-0.1	1.0	-0.7	0.3	0.7
	Durable Goods Manufacturing	-0.4	0.0	0.0	1.7	1.3	4.7	4.4	1.6	1.3	3.1
	Nondurable Goods Manufacturing	-0.5	-0.1	0.1	1.1	0.6	0.8	0.3	1.8	1.3	-1.0
	Non-Specified Manufacturing	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0
	Transportation, Communication, and Public Utilities	0.7	0.4	0.0	0.9	2.1	3.2	4.4	5.1	6.3	-1.9
	Wholesale Trade	0.2	0.2	0.0	0.7	1.1	2.4	2.8	0.7	1.1	1.7
	Retail Trade	1.3	0.8	-0.1	1.1	3.1	1.1	3.2	-0.8	1.2	2.0
	FIRE	0.4	0.2	0.1	1.5	2.2	5.0	5.7	3.6	4.3	1.4
	Business Services	0.9	0.5	0.0	1.3	2.7	-0.1	1.3	-0.8	0.6	0.7
	Repair Services	0.0	0.0	0.0	0.1	0.1	0.0	-0.1	0.4	0.4	-0.4
	Private Households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Hotels, Lodging, and Personal Services other than Private Household	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0
	Entertainment and Recreation	0.6	0.3	-0.1	-0.1	0.8	-0.3	0.5	-0.5	0.4	0.2
	Hospitals	0.2	0.1	0.0	0.7	1.1	-0.4	-0.1	-0.2	0.2	-0.2
	Medical Excluding Hospitals	0.9	0.5	0.0	0.8	2.2	-0.7	0.7	-1.1	0.3	0.4
	Legal, Educational, Social, Religious, and other Professional Services	2.4	1.3	-0.1	2.9	6.5	-1.2	2.5	3.4	7.1	-4.6
	Public Administration (excl. Postal)	0.2	0.1	0.0	0.9	1.2	0.3	0.6	3.3	3.7	-3.0
Family Structure	Never Married, Without Kids	3.6	0.1	-0.2	1.3	4.8	2.7	6.2	2.4	5.9	0.3
	Never Married, With Kids	0.7	0.5	0.0	-0.3	0.9	0.0	1.3	-0.1	1.1	0.1
	Married, Without Kids	2.0	0.4	-0.1	4.5	6.9	4.8	7.1	5.5	7.8	-0.7
	Married, With Kids	1.1	1.3	0.3	7.1	9.8	5.4	8.1	5.6	8.3	-0.2
	Widowed, Divorced, or Separated, Without Kids	2.3	-0.4	0.5	1.1	3.5	1.5	3.9	1.7	4.1	-0.2
	Widowed, Divorced, or Separated, With Kids	0.2	0.5	0.0	0.7	1.3	0.5	1.1	0.6	1.2	-0.1

Within each population subgroup, each cell represents the subgroup's share of variable x multiplied by the subgroup's growth rate in variable x, where x is defined by the column heads. Unweighted growth rates are shown in Appendix Table 2c.

Source: Current Population Survey, Outgoing Rotations Groups
Based on civilian population, age 16 and over.

Appendix: Table 2a
Growth in Real Earnings and Capital: 1961 to 1969

		Population Δ(N)	Employed / Population Δ(E/N)	Annual Weeks Worked / Employed Δ(W/E)	Annual Earnings / Annual Weeks Worked Δ(Y/W)	Annual Earnings Δ(Y)	Capital / Annual Weeks Worked Δ(K/W)	Capital Δ(K)
	Total Population	**13.0%**	**4.8%**	**0.4%**	**27.5%**	**45.6%**	**14.9%**	**33.1%**
Sex	Male	12.0	-0.6	0.7	30.8	43.0	15.4	27.6
	Female	13.9	15.0	-0.1	25.4	54.1	19.8	48.6
Race	White: (Including Hispanic)	12.5	4.9	0.5	26.6	44.4	14.7	32.5
	Black: (Including Hispanic)	17.3	4.9	-1.0	41.5	62.7	19.5	40.7
	Other: (Including Hispanic)	20.5	-8.0	-0.2	28.8	41.1	4.9	17.2
Age	<20	30.9	12.3	1.2	27.0	71.4	-7.2	37.2
	20-29	29.3	10.1	-1.2	21.0	59.3	11.4	49.6
	30-39	-6.3	8.1	-1.4	29.7	30.0	14.8	15.2
	40-49	5.4	5.1	1.1	33.7	45.3	19.4	31.1
	50-59	12.5	3.2	1.9	32.9	50.4	22.7	40.3
	60-65	13.3	2.1	-2.9	33.5	46.0	17.3	29.8
	>65	12.7	-14.6	5.8	21.6	25.6	11.2	15.1
Census Region	Northeast	10.6	4.2	-0.2	23.7	38.3	10.4	25.0
	Midwest	12.6	6.2	-0.7	29.1	47.2	16.2	34.3
	South	17.8	6.2	1.6	36.0	61.6	15.7	41.3
	West	8.9	0.9	0.8	22.4	33.1	17.5	28.2
Schooling	No HS Diploma	-4.7	-2.3	0.3	22.8	16.0	1.2	-5.6
	Just HS diploma	26.6	7.6	0.0	24.7	58.9	12.7	46.9
	Some College/AA	34.7	4.8	0.6	21.5	61.7	13.3	53.5
	BA	27.7	-1.6	2.0	24.6	52.7	32.5	60.6
	>=18 years, or >=Masters	42.4	-0.8	1.7	25.7	68.9	44.3	87.6
Industry	Agriculture	-36.8	-0.2	0.2	38.0	1.3	41.3	4.6
	Forestry and Fisheries	18.3	12.1	-1.9	52.3	80.8	4.9	33.4
	Mining	-29.7	3.4	-11.8	32.1	-6.0	24.1	-14.0
	Construction	9.0	7.8	-2.2	36.5	51.1	1.7	16.3
	Durable Goods Manufacturing	26.7	1.1	2.4	20.0	50.3	4.6	34.9
	Nondurable Goods Manufacturing	14.8	1.4	0.8	17.3	34.3	17.0	34.1
	Transportation, Communication, and Public Utilities	18.1	1.6	-1.7	22.9	40.8	1.3	19.2
	Wholesale Trade	0.4	2.5	-1.4	31.2	32.7	49.8	51.2
	Retail Trade	14.3	1.0	-2.4	29.9	42.8	7.1	20.0
	FIRE	23.1	0.2	-0.2	29.8	53.0	7.6	30.8
	Business Services	45.3	-1.1	-2.5	19.9	61.6	20.5	62.2
	Repair Services	9.5	0.8	-1.1	34.5	43.7	24.4	33.6
	Private Households	-27.0	0.7	5.1	5.0	-16.2	-2.2	-23.3
	Hotels, Lodging, and Personal Services other than Private Household	-2.5	2.5	-3.1	-1.2	-4.2	90.9	87.8
	Entertainment and Recreation	2.7	1.1	-0.8	10.3	13.4	-21.9	-18.8
	Hospitals	40.3	1.1	1.6	20.0	63.0	9.4	52.4
	Medical Excluding Hospitals	56.9	0.2	-2.4	31.1	85.8	13.8	68.4
	Legal, Educational, Social, Religious, and other Professional Services	41.0	-0.4	4.5	19.3	64.4	58.7	103.8
	Public Administration (excl. Postal)	25.5	-0.2	0.6	19.3	45.2	8.5	34.4
Marital	Never Married	27.6	-0.3	2.3	15.7	45.3	4.9	34.5
	Married	8.4	7.0	0.1	30.2	45.7	17.2	32.7
	Widowed, Divorced, or Separated	15.3	1.4	-0.5	28.8	45.1	17.3	33.5

Source: March Current Population Survey
Based on civilian population, age 16 and over.

Appendix: Table 2b
Growth in Real Earnings, Output, and Capital: 1979-80 to 1990

		Population Δ(N)	Employed / Population Δ(E/N)	Annual Weeks Worked / Employed Δ(W/E)	Annual Earnings / Annual Weeks Worked Δ(Y/W)	Annual Earnings Δ(Y)	Annual Output / Annual Weeks Worked Δ(Q/W)	Annual Output Δ(Q)	Capital / Annual Weeks Worked Δ(K/W)	Capital Δ(K)	Annual Production / Capital Δ(Q/K)
	Total Population	**12.2%**	**4.8%**	**1.8%**	**8.7%**	**27.4%**	**10.0%**	**28.8%**	**19.1%**	**37.9%**	**-9.1%**
Sex	Male	12.9	-1.7	2.5	4.0	17.7	11.9	25.7	14.3	28.1	-2.4
	Female	11.5	12.8	1.0	20.4	45.7	8.2	33.6	32.1	57.5	-23.9
Race/Ethnicity	White (Non-Hispanic)	6.8	5.1	1.7	10.2	23.8	10.5	24.1	19.7	33.3	-9.2
	Black (Non-Hispanic)	18.8	5.2	3.7	4.9	32.6	7.0	34.7	23.3	51.0	-16.3
	Hispanic	53.3	5.7	-0.9	3.2	61.5	11.7	69.9	10.6	68.8	1.1
	Other (Non-Hispanic)	48.5	-0.9	7.1	10.7	65.3	8.5	63.1	14.7	69.3	-6.2
Age	<20	-19.4	-5.2	4.4	-17.7	-38.0	-11.8	-32.0	-13.2	-33.5	1.5
	20-29	-1.8	4.1	1.9	0.4	4.6	5.0	9.2	5.2	9.4	-0.1
	30-39	30.8	5.8	0.9	4.1	41.6	9.5	47.0	18.7	56.2	-9.2
	40-49	32.6	7.2	0.0	11.4	51.2	12.0	51.8	26.0	65.7	-13.9
	50-59	-4.7	5.2	-0.2	5.4	5.7	11.8	12.1	18.4	18.7	-6.6
	60-65	8.1	-4.1	0.3	2.2	6.3	12.6	16.8	22.5	26.7	-9.9
	>65	21.8	-6.3	5.9	10.8	32.2	8.6	30.0	25.4	46.7	-16.8
Census Region	Northeast	4.0	6.2	0.5	17.6	28.4	12.2	23.0	26.5	37.3	-14.3
	Midwest	3.1	4.5	2.4	3.3	13.3	10.0	19.9	16.6	26.6	-6.7
	South	18.6	4.7	2.6	7.5	33.3	9.0	34.9	17.3	43.2	-8.3
	West	22.0	3.7	1.4	8.0	35.0	8.0	35.1	15.3	42.4	-7.2
Schooling	No HS Diploma	-17.1	-6.8	2.7	-13.9	-35.1	6.6	-14.6	-1.7	-22.9	8.3
	Just HS diploma	14.3	-0.5	1.7	-1.5	13.9	7.8	23.2	12.5	27.9	-4.7
	Some College/AA	27.2	4.6	0.6	5.2	37.5	7.2	39.6	17.8	50.2	-10.6
	BA	35.2	3.7	0.3	11.2	50.4	11.4	50.7	29.1	68.3	-17.6
	>=18 years, or >=Masters	47.1	-1.1	0.7	14.4	61.1	0.7	47.4	30.6	77.3	-29.9
Occupation	Executive, Administrative and Managerial Occupations	18.8	-0.1	0.9	14.2	33.8	18.5	38.1	30.5	50.2	-12.1
	Professional Specialty Occupations	24.8	0.5	0.9	15.5	41.8	2.4	28.6	36.9	63.1	-34.6
	Technicians and Related Support Occupations	50.6	-0.3	1.8	0.7	52.8	7.7	59.7	-3.4	48.7	11.1
	Sales Occupations	53.0	0.4	4.7	5.9	63.9	-6.1	51.9	17.7	75.8	-23.8
	Administrative Support Occupations, Including Clerical	10.9	0.3	3.9	4.0	19.1	-2.6	12.5	16.8	32.0	-19.4
	Private Household Service Occupations	-36.1	0.0	11.8	36.1	11.8	-2.5	-26.7	-0.5	-24.7	-2.0
	Protective Service Occupations	29.3	0.7	2.1	7.0	39.1	1.1	33.2	5.4	37.5	-4.3
	Service Occupations (excl. Private House & Protective)	22.0	0.9	5.7	3.1	31.7	-5.0	23.7	16.9	45.6	-21.9
	Farming, Forestry and Fishing Occupations	-7.4	-0.3	0.3	15.7	8.4	52.3	44.9	5.9	-1.5	46.4
	Precision Production, Craft and Repair Occupations	10.9	-0.6	1.6	-6.5	5.5	15.1	27.0	10.0	21.9	5.1
	Machine Operators, Assemblers and Inspectors	-29.7	2.0	3.3	-0.8	-25.1	24.9	0.6	29.5	5.2	-4.6
	Transportation and Material Moving Occupations	9.2	1.0	0.9	-5.6	5.5	16.0	27.1	20.3	31.5	-4.4
	Handlers, Equipment Cleaners, Helpers, and Laborers	21.7	1.6	3.5	-11.5	15.3	1.7	28.6	-17.7	9.2	19.4
Industry	Agriculture	-5.5	-1.1	1.9	16.0	11.4	58.1	53.4	0.6	-4.0	57.5
	Forestry and Fisheries	-5.6	3.8	0.3	-2.8	-4.4	31.3	29.8	-19.7	-21.3	51.1
	Mining	-22.5	1.2	0.8	-0.8	-21.4	50.2	29.7	51.6	31.1	-1.4
	Construction	17.6	0.5	3.3	-3.3	18.0	-6.6	14.8	-26.7	-5.4	20.2
	Durable Goods Manufacturing	-8.5	1.0	2.1	6.9	1.5	35.3	29.9	30.2	24.8	5.1
	Nondurable Goods Manufacturing	-5.3	1.3	2.1	5.9	4.0	21.6	19.7	18.7	16.8	3.0
	Non-Specified Manufacturing	64.4	-1.3	5.6	-68.3	0.5	20.8	89.5	13.3	82.1	7.4
	Transportation, Communication, and Public Utilities	10.9	0.3	1.4	3.1	15.7	18.2	30.8	10.8	23.4	7.4
	Wholesale Trade	18.7	-0.1	3.1	4.4	26.1	26.0	47.7	48.5	70.2	-22.5
	Retail Trade	19.2	0.2	4.0	3.6	27.0	10.4	33.8	12.6	36.0	-2.2
	FIRE	29.0	0.4	2.6	17.9	49.9	-3.4	28.6	40.3	72.3	-43.7
	Business Services	80.0	-0.5	5.2	5.3	90.0	-3.8	80.9	-8.5	76.2	4.7
	Repair Services	33.3	0.2	2.5	3.9	39.9	-6.2	29.8	-12.2	23.8	6.0
	Private Households	-24.9	0.1	12.0	40.4	27.7	1.9	-10.8	4.0	-8.7	-2.2
	Hotels, Lodging, and Personal Services other than Private Household	33.2	1.1	5.2	9.8	49.4	-4.1	35.4	21.1	60.6	-25.2
	Entertainment and Recreation	33.0	1.2	5.5	11.7	51.3	5.7	45.3	-25.7	13.9	31.5
	Hospitals	15.0	0.7	3.6	22.9	42.2	-15.9	3.4	29.4	48.7	-45.3
	Medical Excluding Hospitals	36.7	0.7	4.7	19.6	61.8	-15.7	26.5	27.7	69.8	-43.3
	Legal, Educational, Social, Religious, and other Professional Services	24.7	1.2	1.5	11.3	38.6	-5.8	21.6	49.1	76.5	-54.9
	Public Administration (excl. Postal)	18.4	1.6	2.6	10.6	33.2	1.7	24.3	11.0	33.6	-9.3
Family Structure	Never Married	16.5	4.5	5.4	12.8	39.2	7.6	34.1	14.6	41.1	-7.0
	Married	5.9	5.2	1.6	7.8	20.5	10.5	23.2	19.7	32.4	-9.3
	Widowed, Divorced, Separated, or Spouse Absent	27.4	8.7	-1.6	11.4	45.9	11.8	46.3	26.2	60.8	-14.4

Source: Current Population Survey, Outgoing Rotations Group
Based on civilian population, age 16 and over
1979-80 refers to the period of July 1979 to June 1980.

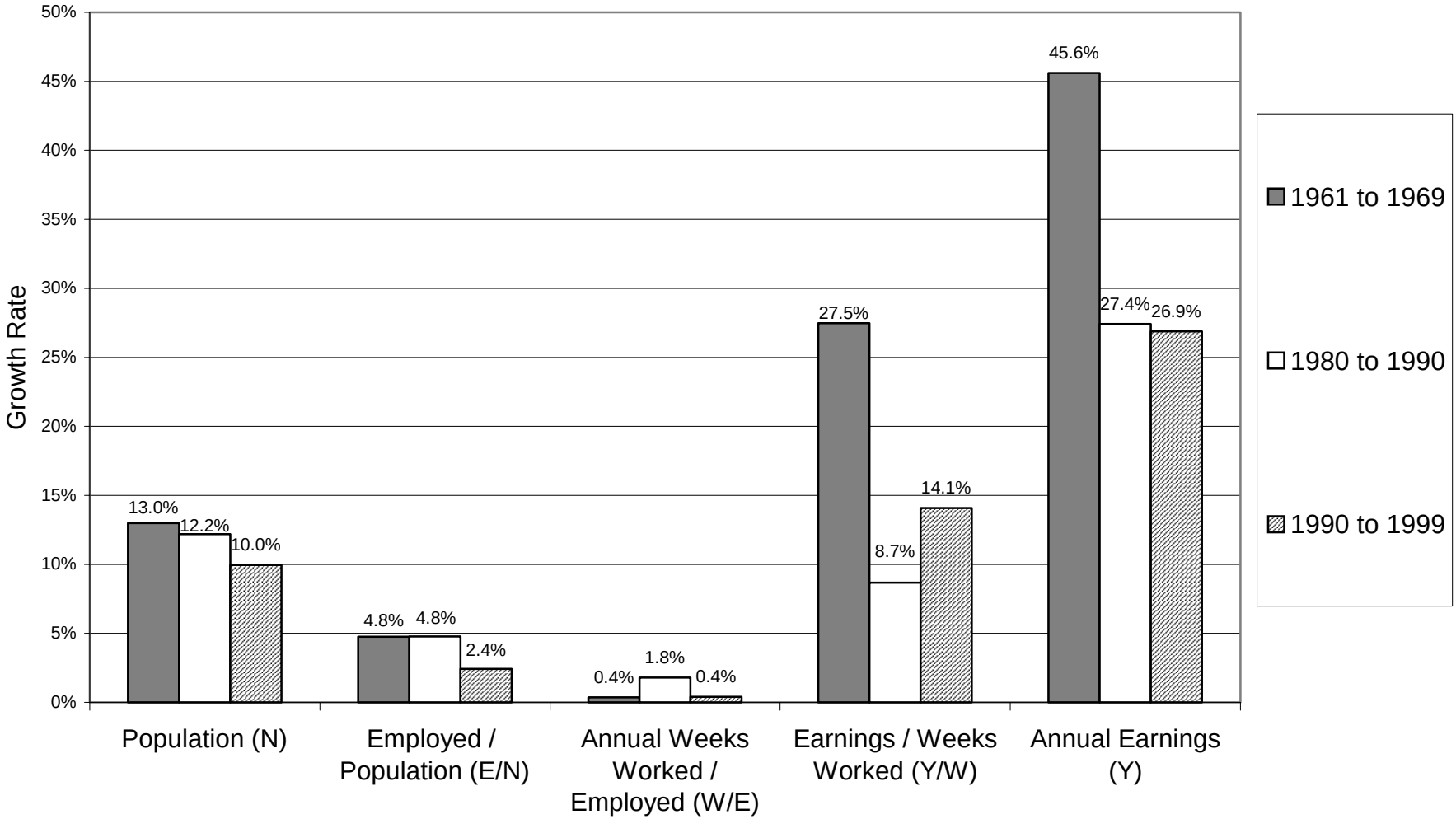
Appendix: Table 2c
Growth in Real Earnings, Output, and Capital: 1990 to 1999

		Population Δ(N)	Employed / Population Δ(E/N)	Annual Weeks Worked / Employed Δ(W/E)	Annual Earnings / Annual Weeks Worked Δ(Y/W)	Annual Earnings Δ(Y)	Annual Output / Annual Weeks Worked Δ(Q/W)	Annual Output Δ(Q)	Capital / Annual Weeks Worked Δ(K/W)	Capital Δ(K)	Annual Production / Capital Δ(Q/K)
	Total Population	**10.0%**	**2.4%**	**0.4%**	**14.1%**	**26.9%**	**15.0%**	**27.8%**	**15.8%**	**28.6%**	**-0.8%**
Sex	Male	10.6	-0.3	0.6	13.8	24.8	17.0	28.0	13.0	23.9	4.1
	Female	9.3	5.5	0.3	15.6	30.7	12.4	27.5	21.6	36.7	-9.2
Race/Ethnicity	White (Non-Hispanic)	3.9	1.9	0.4	15.5	21.7	15.6	21.8	16.9	23.1	-1.4
	Black (Non-Hispanic)	13.8	7.4	-0.9	17.1	37.4	15.9	36.2	14.3	34.6	1.6
	Hispanic	40.8	2.6	2.3	7.2	52.9	13.2	58.9	14.1	59.8	-0.9
	Other (Non-Hispanic)	44.9	3.4	0.9	13.5	62.7	12.6	61.8	14.8	64.0	-2.2
Age	<20	15.0	-1.5	-3.1	6.9	17.4	18.4	28.8	17.7	28.2	0.7
	20-29	-6.3	1.7	0.7	6.4	2.4	11.2	7.2	12.4	8.5	-1.2
	30-39	0.6	1.8	0.8	12.0	15.3	12.5	15.7	6.3	9.5	6.2
	40-49	28.2	1.1	0.5	12.2	42.0	14.5	44.3	15.9	45.7	-1.5
	50-59	27.0	5.4	0.9	18.4	51.8	17.4	50.7	23.3	56.7	-5.9
	60-65	-5.7	4.7	2.7	11.5	13.3	15.3	17.0	12.3	14.1	3.0
	>65	10.6	4.9	-3.4	21.5	33.5	25.1	37.1	21.8	33.8	3.3
Census Region	Northeast	1.9	0.9	2.2	8.8	13.8	11.9	16.9	13.3	18.3	-1.4
	Midwest	5.1	5.2	-1.3	19.5	28.5	20.2	29.2	19.7	28.7	0.4
	South	13.3	2.6	-0.6	17.4	32.7	16.0	31.3	15.8	31.1	0.2
	West	17.3	0.5	2.4	8.8	29.1	10.0	30.3	12.5	32.8	-2.5
Schooling	No HS Diploma	-10.4	5.0	-3.1	-0.6	-9.2	18.1	9.5	8.8	0.2	9.3
	Just HS diploma	2.7	-2.6	1.4	7.6	9.1	14.5	16.1	10.3	11.8	4.2
	Some College/AA	24.0	0.5	1.0	8.0	33.4	13.5	38.9	12.0	37.4	1.5
	BA	27.6	-1.4	2.0	13.0	41.1	10.3	38.5	14.1	42.3	-3.8
	>=18 years, or >=Masters	25.2	-2.4	0.8	18.6	42.1	8.7	32.2	33.7	57.2	-25.0
Occupation	Executive, Administrative and Managerial Occupations	27.1	0.4	0.1	14.2	41.8	14.6	42.3	15.1	42.8	-0.5
	Professional Specialty Occupations	27.6	0.0	1.3	12.0	40.9	5.9	34.7	33.0	61.9	-27.1
	Technicians and Related Support Occupations	10.1	0.9	0.3	7.2	18.5	12.8	24.1	8.4	19.7	4.4
	Sales Occupations	11.4	0.4	0.1	16.8	28.8	19.8	31.8	11.2	23.2	8.6
	Administrative Support Occupations, Including Clerical	-1.8	0.6	-1.3	6.4	3.8	14.6	12.0	18.8	16.2	-4.2
	Private Household Service Occupations	11.7	-2.0	4.2	26.4	40.4	12.6	26.6	14.4	28.3	-1.7
	Protective Service Occupations	22.0	0.5	0.4	5.5	28.4	5.1	28.0	18.0	40.9	-12.9
	Service Occupations (excl. Private House & Protective)	11.9	1.0	1.8	10.1	24.8	4.9	19.6	8.5	23.3	-3.6
	Farming, Forestry and Fishing Occupations	1.1	-0.9	0.6	22.8	23.7	11.3	12.1	-5.0	-4.2	16.3
	Precision Production, Craft and Repair Occupations	4.4	2.3	0.8	8.0	15.5	19.3	26.8	10.8	18.3	8.5
	Machine Operators, Assemblers and Inspectors	-10.5	2.4	0.3	10.7	2.8	27.2	19.3	21.3	13.4	5.9
	Transportation and Material Moving Occupations	10.7	2.7	-0.6	4.9	17.7	16.8	29.6	9.3	22.1	7.5
	Handlers, Equipment Cleaners, Helpers, and Laborers	5.2	2.9	-0.9	9.2	16.4	18.1	25.3	7.0	14.2	11.1
Industry	Agriculture	2.9	0.1	-1.9	28.3	29.4	13.1	14.2	-5.7	-4.6	18.9
	Forestry and Fisheries	-17.0	1.6	6.6	18.3	9.5	-17.7	-26.5	16.4	7.6	-34.1
	Mining	-25.2	-1.0	4.6	8.5	-13.0	36.8	15.3	30.0	8.4	6.8
	Construction	11.3	3.9	0.6	8.7	24.5	5.1	20.9	15.8	31.6	-10.7
	Durable Goods Manufacturing	-5.7	2.4	0.2	13.0	9.9	43.0	39.9	21.1	18.0	21.9
	Nondurable Goods Manufacturing	-10.7	1.7	1.3	15.3	7.6	12.2	4.5	28.4	20.7	-16.2
	Non-Specified Manufacturing	105.2	4.7	0.2	50.3	160.4	29.3	139.4	24.9	135.0	4.4
	Transportation, Communication, and Public Utilities	15.7	0.8	-0.1	4.9	21.3	20.3	36.7	5.8	22.2	14.5
	Wholesale Trade	9.1	1.6	-0.5	14.6	24.8	45.3	55.6	36.7	47.0	8.6
	Retail Trade	11.8	1.0	0.3	18.5	31.6	25.2	38.3	18.0	31.1	7.2
	FIRE	8.8	0.4	1.1	15.1	25.4	16.0	26.3	13.9	24.2	2.1
	Business Services	27.0	0.6	1.3	27.5	56.5	6.2	35.1	28.5	57.4	-22.3
	Repair Services	-2.1	1.0	-0.6	11.4	9.8	-3.5	-5.1	44.4	42.8	-47.8
	Private Households	-4.4	-2.2	5.7	17.6	16.7	9.8	8.9	11.5	10.7	-1.8
	Hotels, Lodging, and Personal Services other than Private Household	-1.9	1.1	0.2	24.8	24.2	1.7	1.2	3.4	2.9	-1.7
	Entertainment and Recreation	53.9	1.4	0.5	12.4	68.2	-1.7	54.1	11.0	66.8	-12.7
	Hospitals	7.6	0.6	0.4	12.6	21.2	-10.9	-2.3	18.1	26.8	-29.0
	Medical Excluding Hospitals	30.8	0.8	0.8	23.1	55.4	-11.8	20.5	16.5	48.8	-28.3
	Legal, Educational, Social, Religious, and other Professional Services	25.6	0.1	1.0	14.9	41.7	1.6	28.3	60.3	87.1	-58.7
	Public Administration (excl. Postal)	5.6	0.7	0.3	11.1	17.7	7.9	14.5	20.2	26.8	-12.3
Family Structure	Never Married, Without Kids	15.1	0.1	-0.1	12.5	27.6	27.6	14.5	16.7	31.7	31.7
	Never Married, With Kids	45.4	30.1	-1.3	7.4	81.6	81.6	12.9	14.1	88.3	88.3
	Married, Without Kids	7.1	2.6	-0.6	15.8	24.9	24.9	18.0	20.0	29.1	29.1
	Married, With Kids	4.0	3.2	0.7	16.8	24.8	24.8	14.9	14.1	22.0	22.0
	Widowed, Divorced, or Separated, Without Kids	15.2	2.4	3.6	10.4	31.5	31.5	13.2	15.8	36.9	36.9
	Widowed, Divorced, or Separated, With Kids	5.4	10.2	-0.8	18.2	33.0	33.0	12.3	15.0	29.9	29.9

Source: Current Population Survey, Outgoing Rotations Groups
Based on civilian population, age 16 and over.

Figure 1

Real Earnings Growth and its Components: Three Expansions

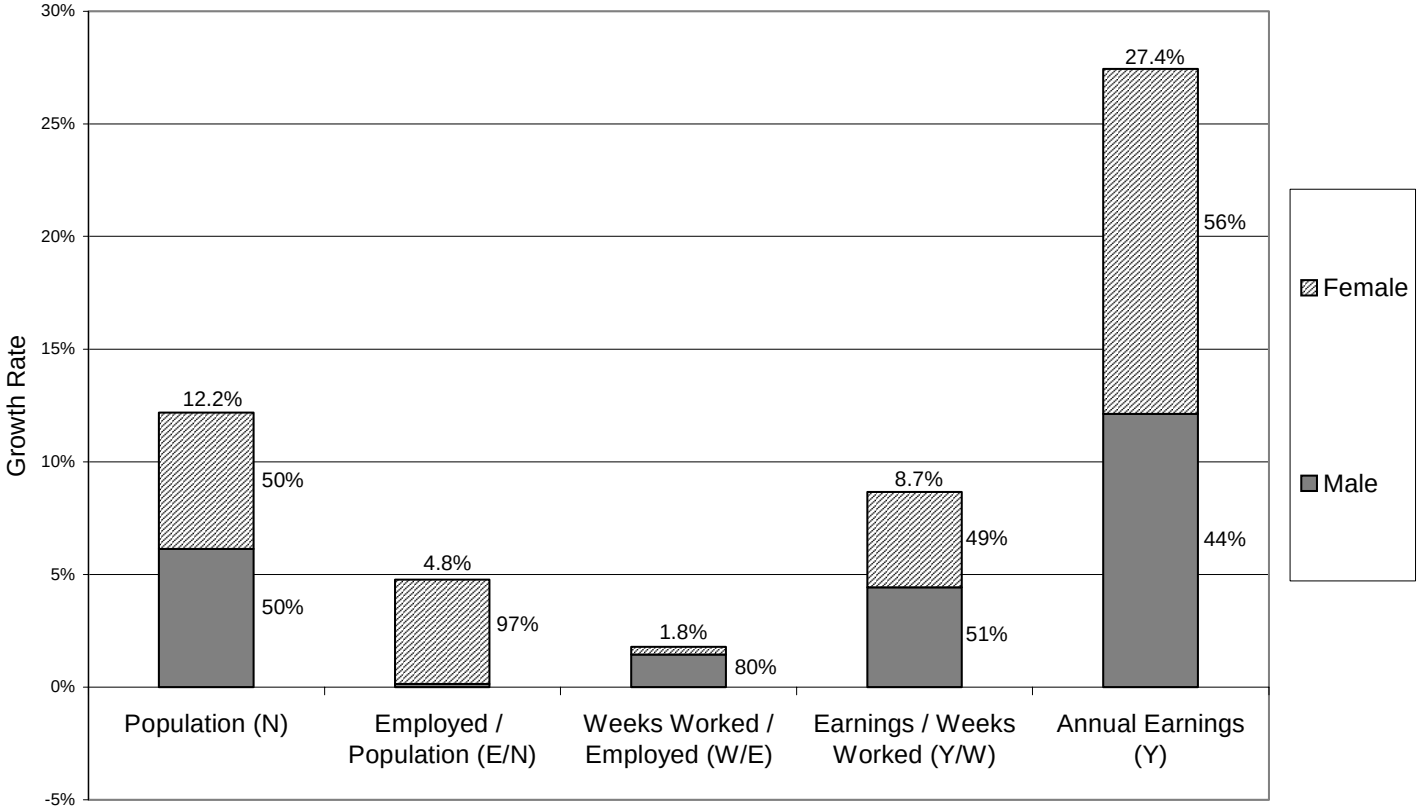


Based on civilian population, age 16 and over. Earnings are deflated by the PCE price index.
1980 refers to the period of July 1979 to June 1980.

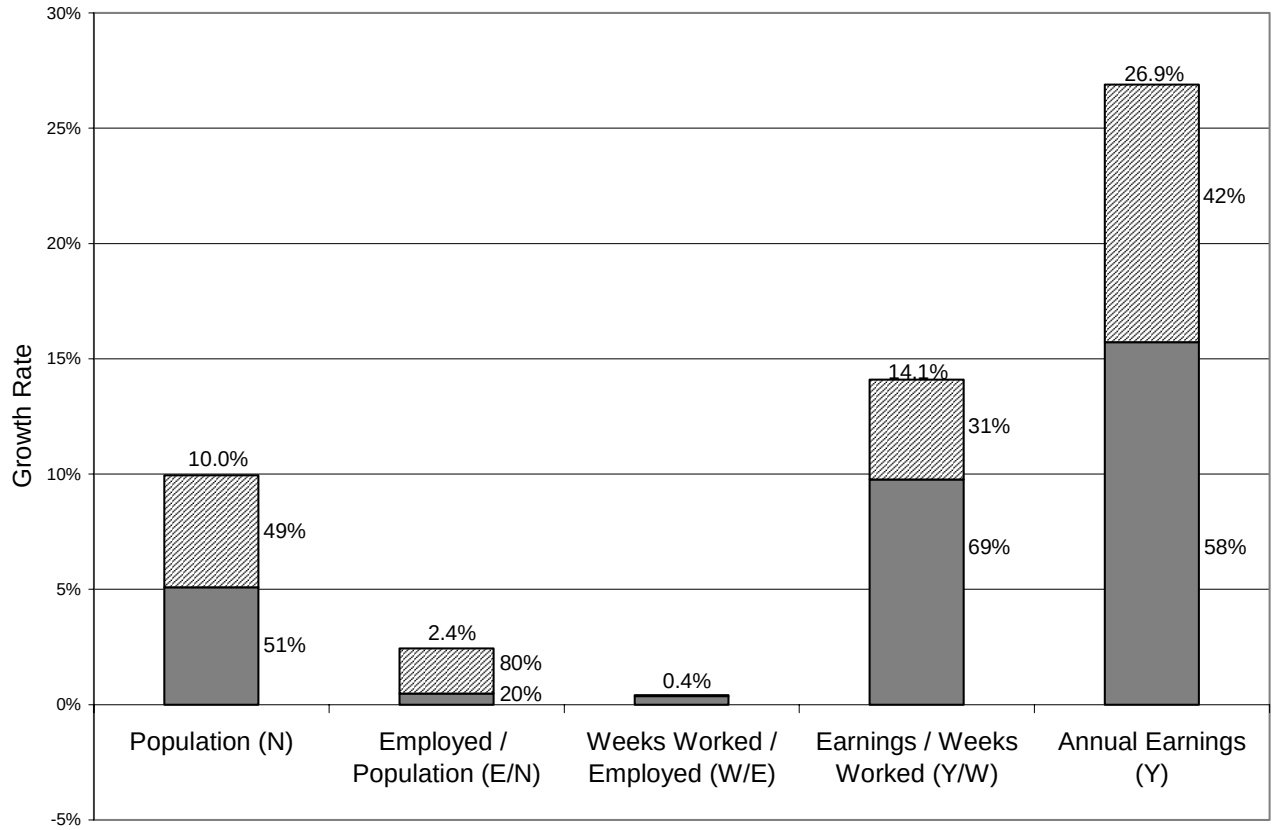
Figure 2

Contributions to Real Earnings Growth and Its Components: Sex

A: 1980-1990



B: 1990-1999

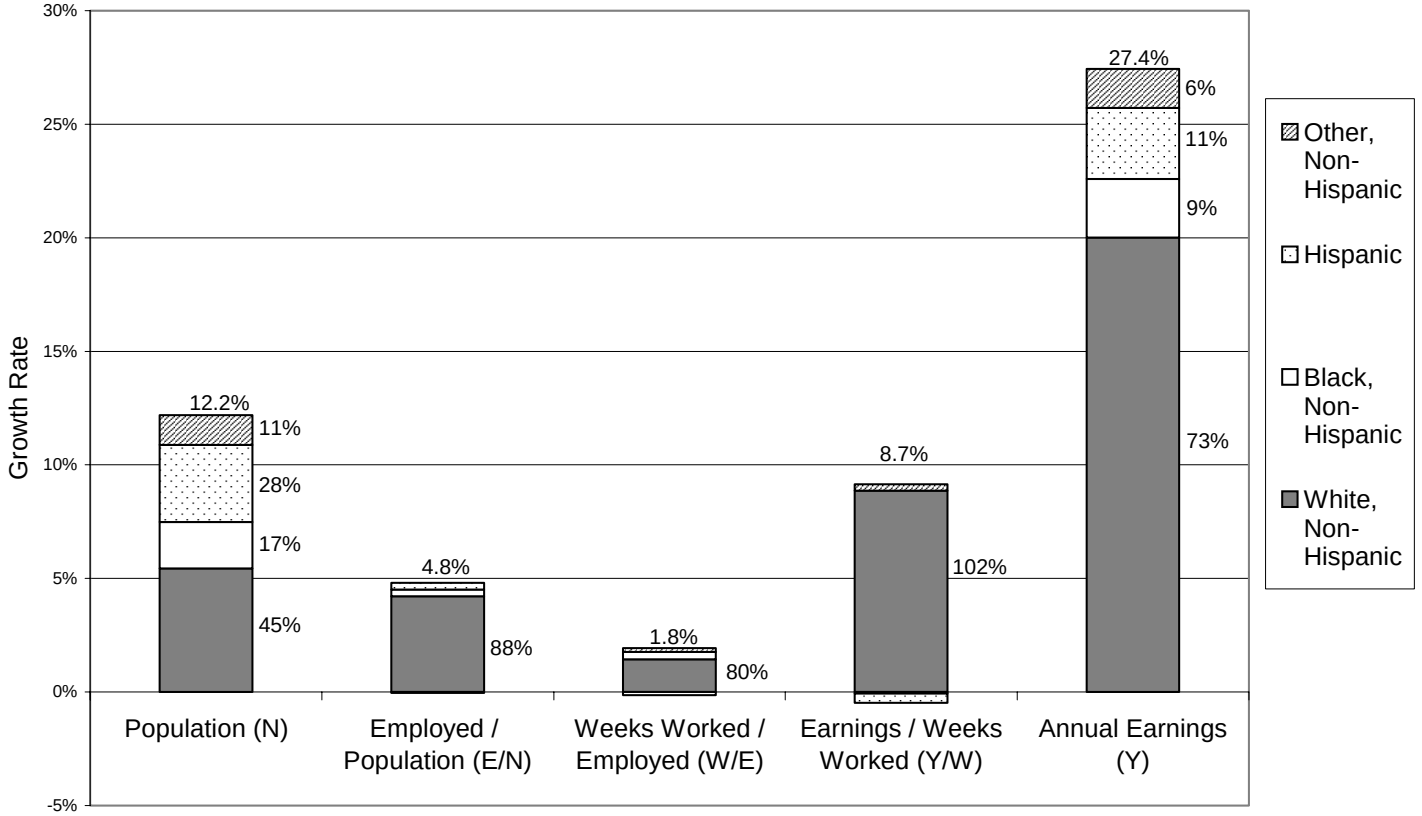


Based on civilian population, age 16 and over. Earnings are deflated by the PCE price index.
1980 refers to the period of July 1979 to June 1980.
Each group's share of the contribution to growth is given to the right of the bars.

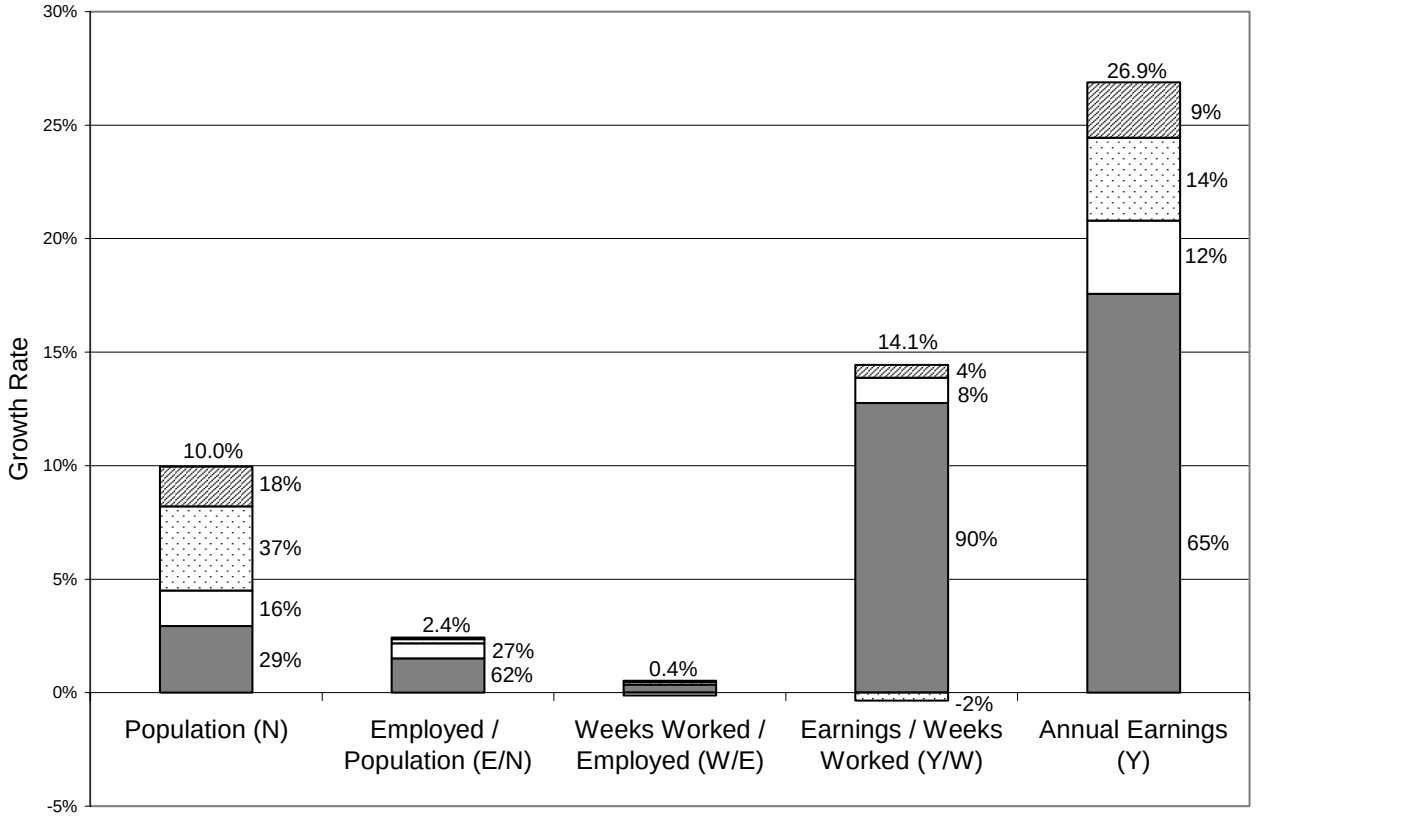
Figure 3

Contributions to Real Earnings Growth and Its Components: Race/Ethnicity

A: 1980-1990



B: 1990-99

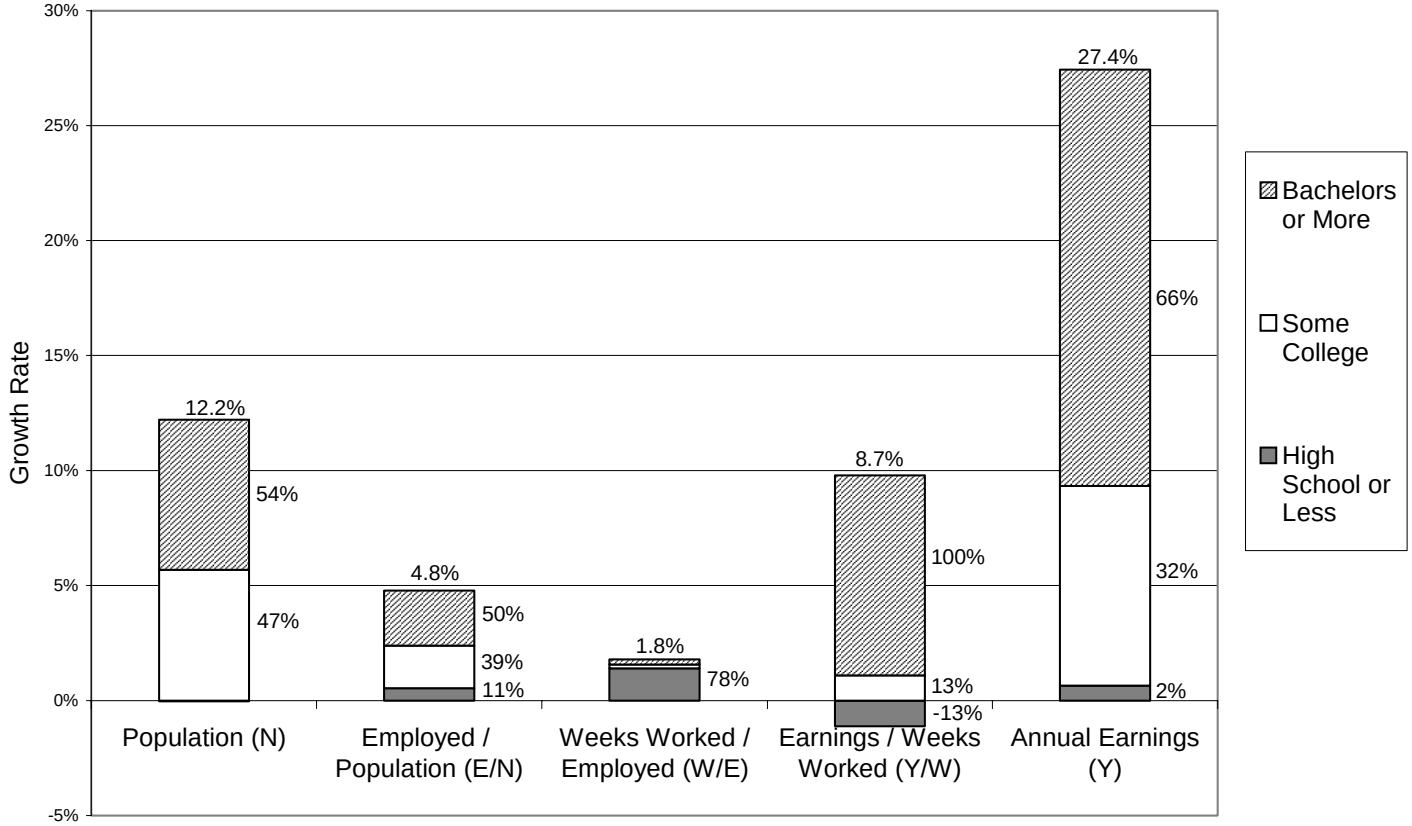


Based on civilian population, age 16 and over. Earnings are deflated by the PCE price index.
1980 refers to the period of July 1979 to June 1980.
Each group's share of the contribution to growth is given to the right of the bars.

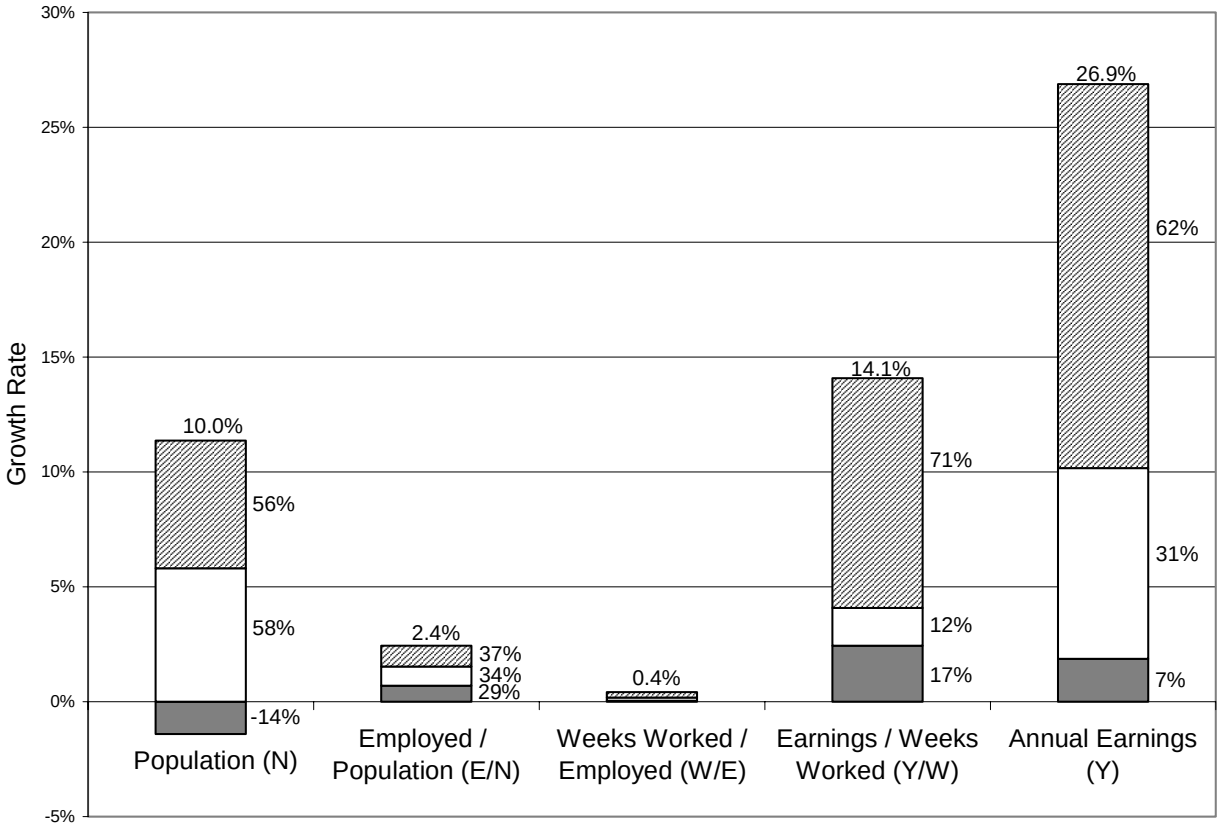
Figure 4

Contributions to Real Earnings Growth and Its Components: Education

A: 1980-1990



B: 1990-1999

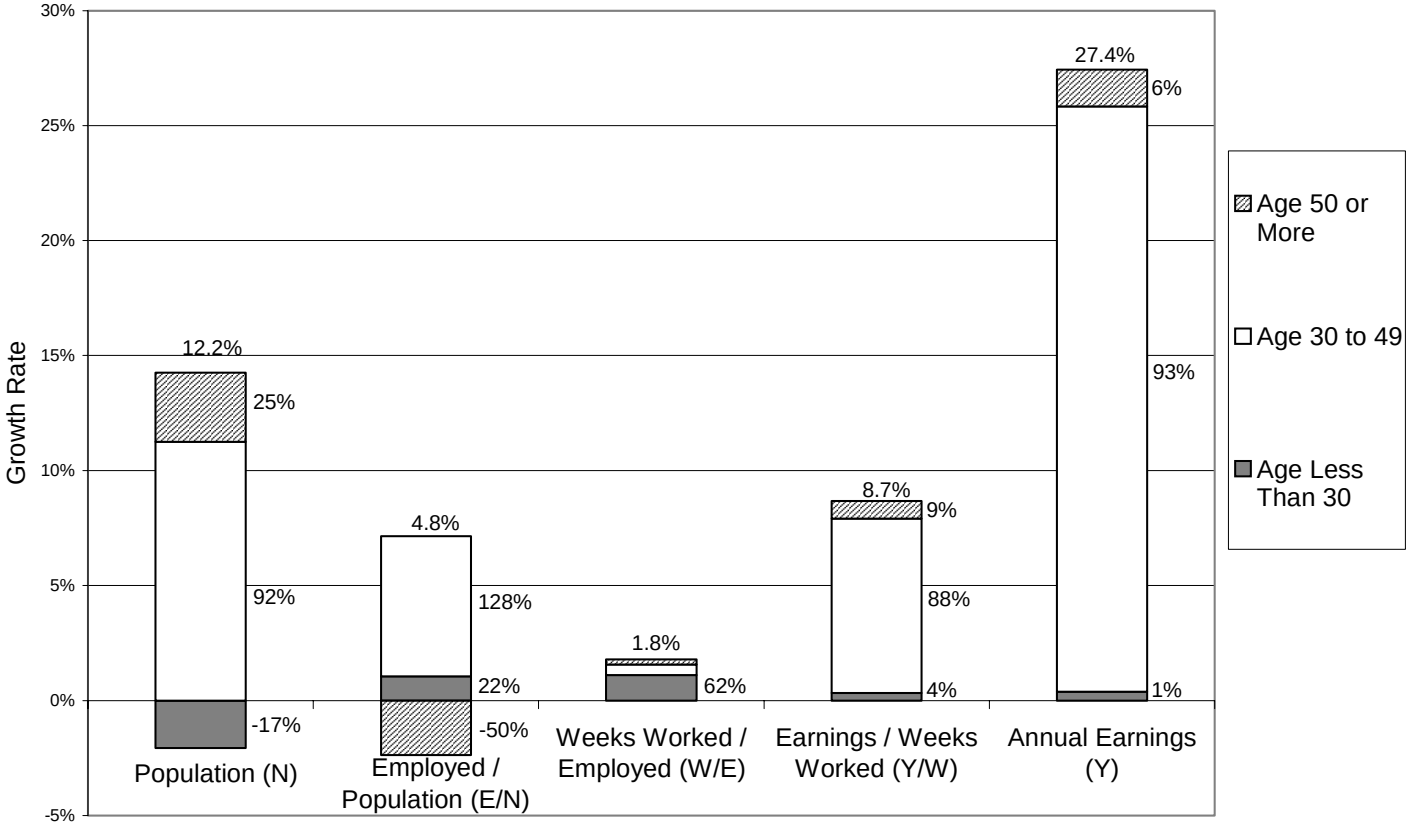


Based on civilian population, age 16 and over. Earnings are deflated by the PCE price index.
1980 refers to the period of July 1979 to June 1980.
Each group's share of the contribution to growth is given to the right of the bars.

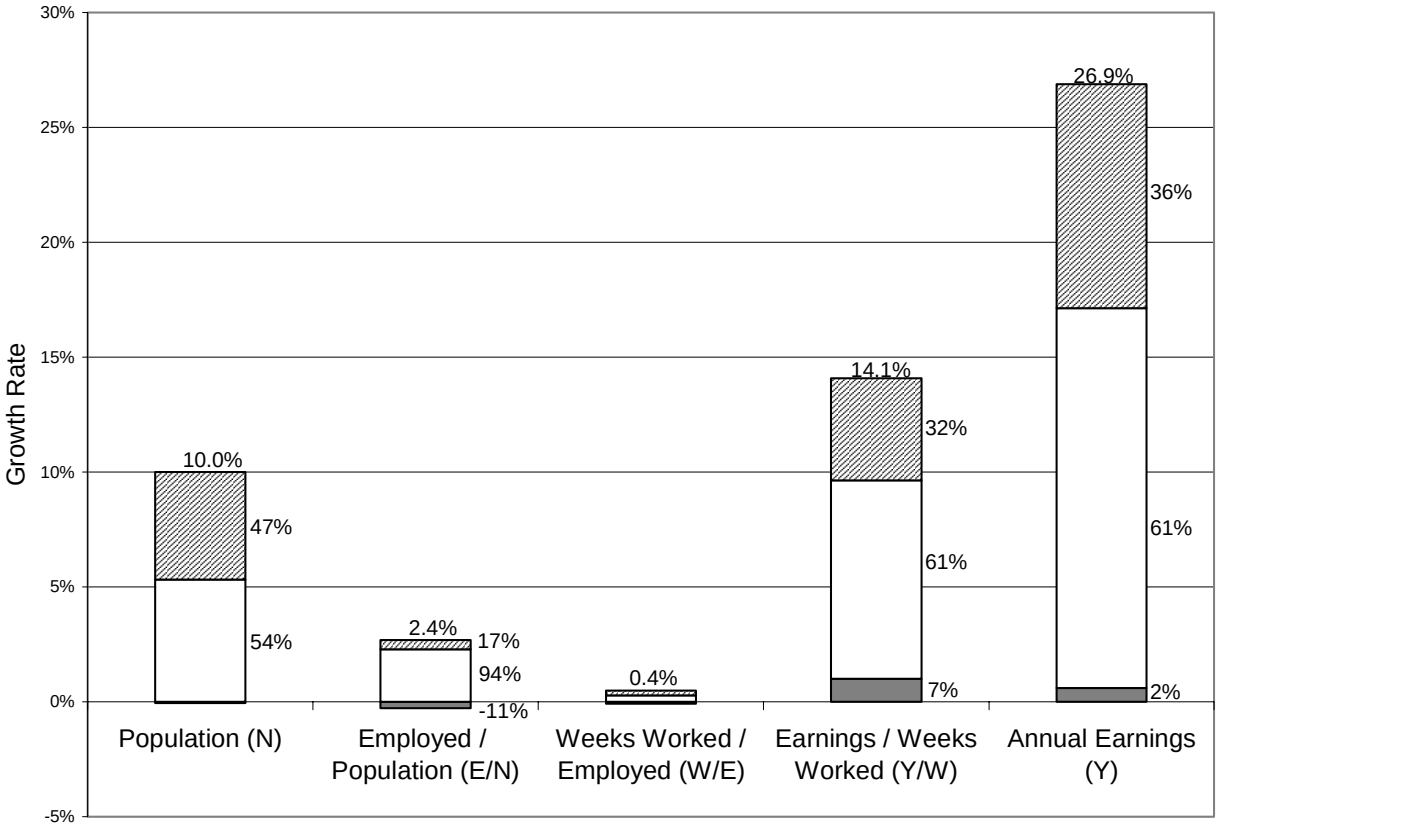
Figure 5

Contributions to Real Earnings Growth and Its Components: Age

A: 1980-1990



B: 1990-1999

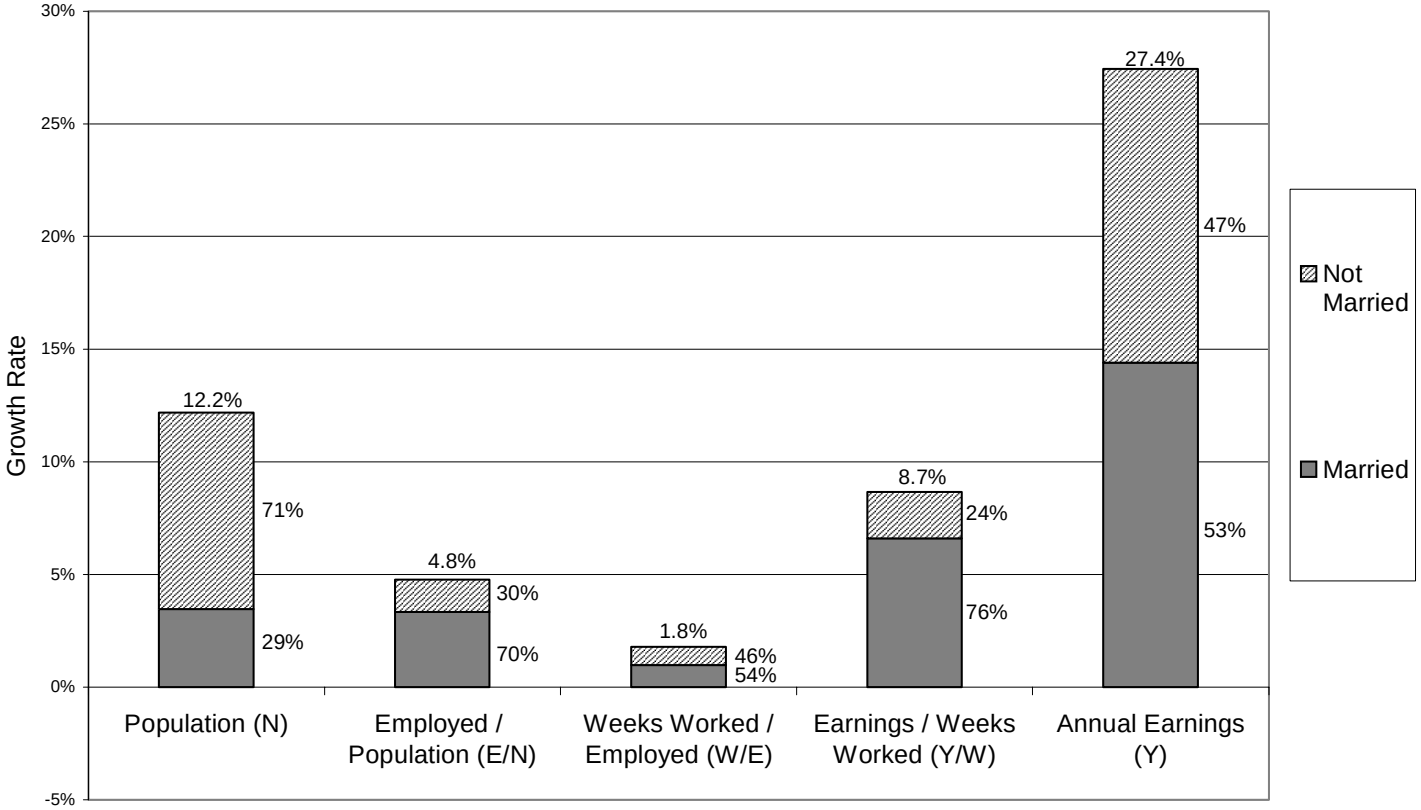


Based on civilian population, age 16 and over. Earnings are deflated by the PCE price index.
1980 refers to the period of July 1979 to June 1980.
Each group's share of the contribution to growth is given to the right of the bars.

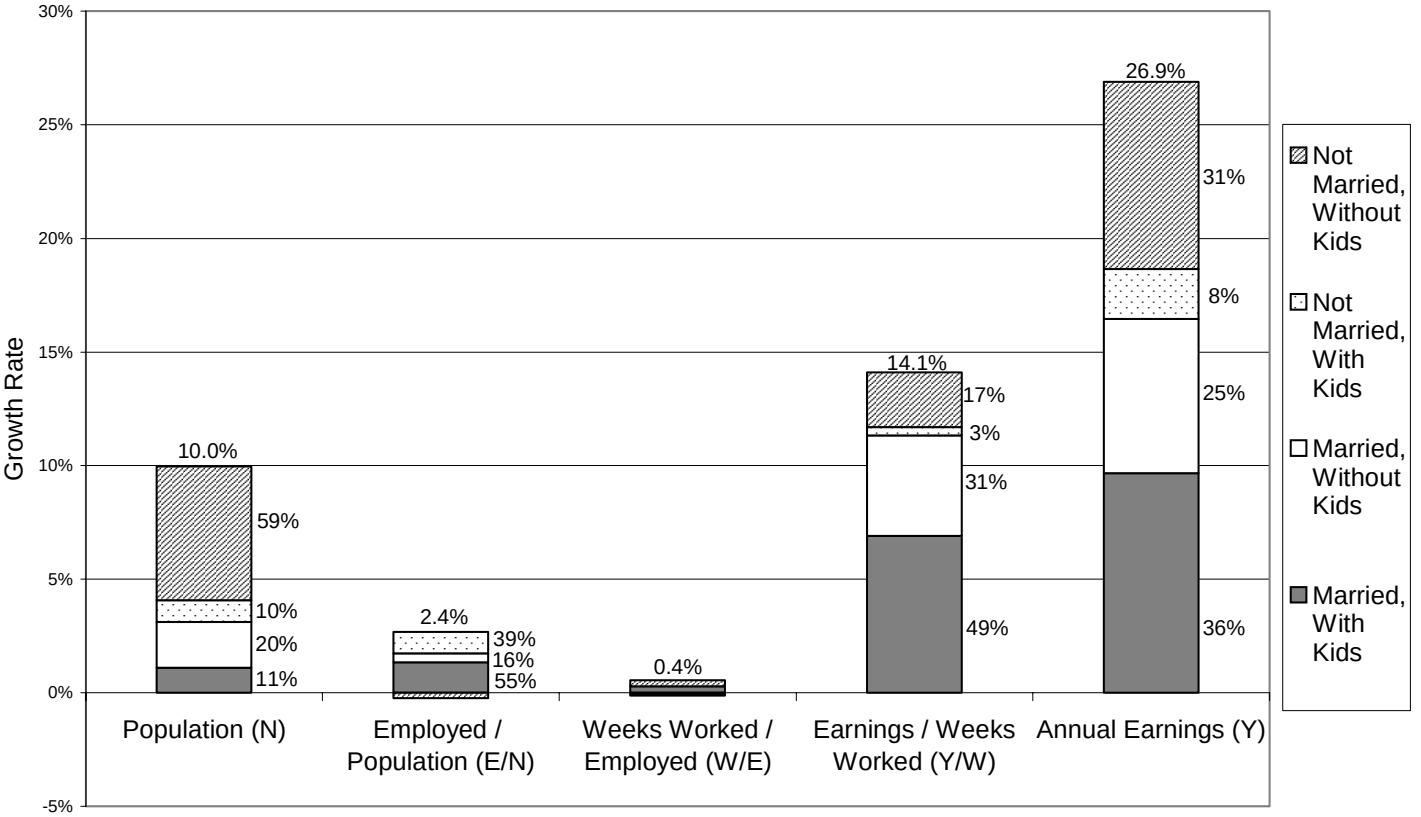
Figure 6

Contributions to Real Earnings Growth and Its Components: Marital Status

A: 1980-1990



B: 1990-1999

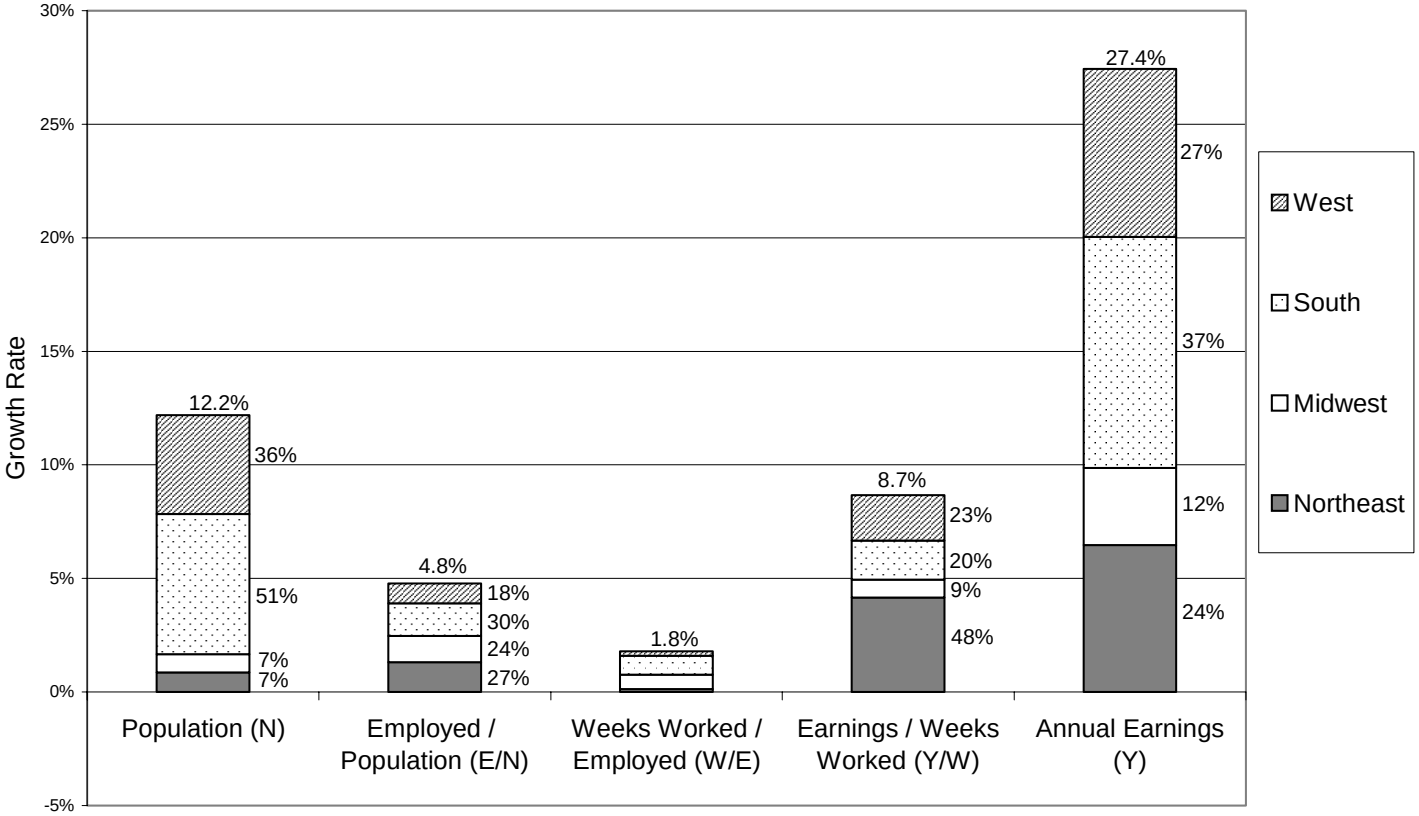


Based on civilian population, age 16 and over. Earnings are deflated by the PCE price index.
1980 refers to the period of July 1979 to June 1980.
Each group's share of the contribution to growth is given to the right of the bars.

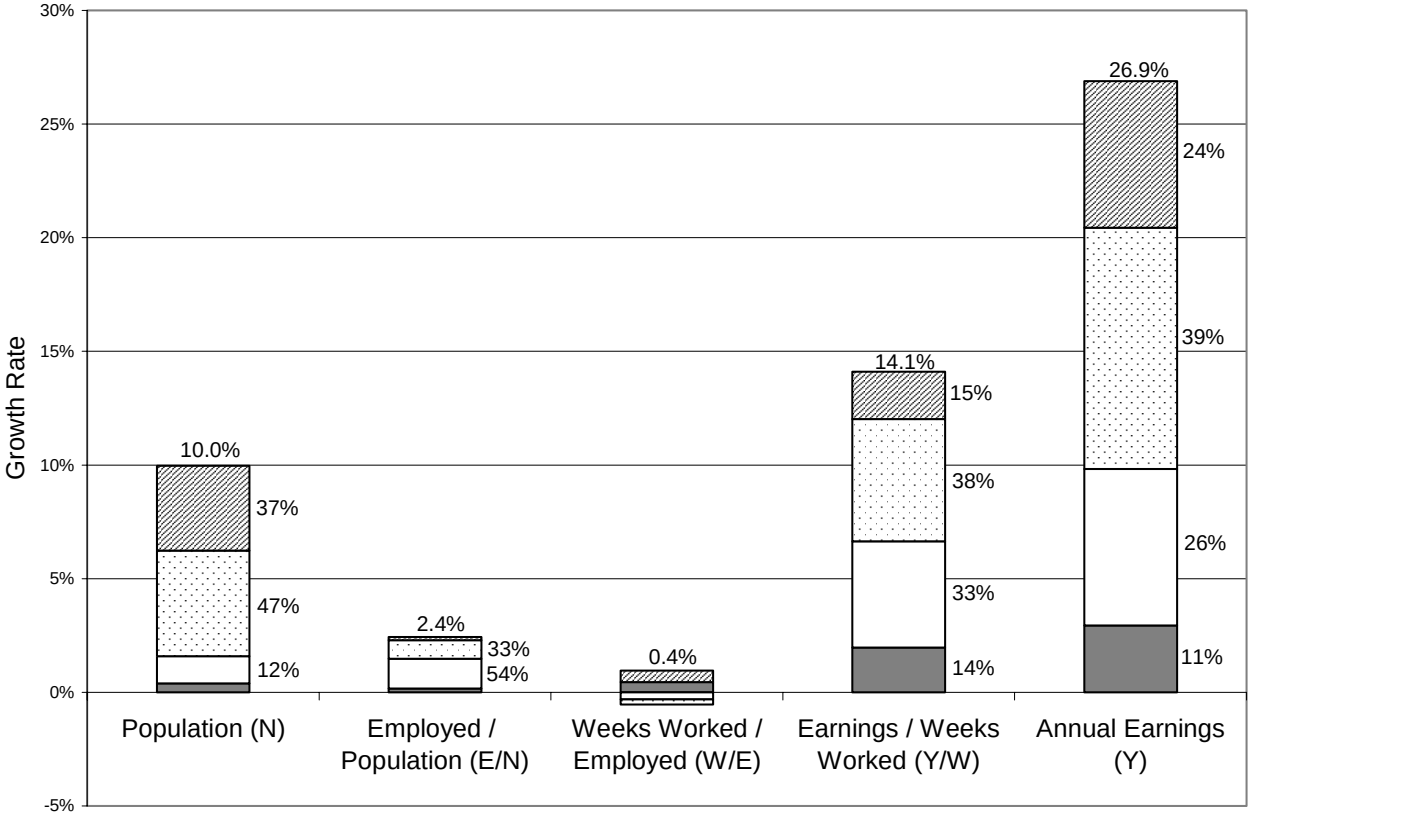
Figure 7

Contributions to Real Earnings Growth and Its Components: Region

A: 1980-1990



B: 1990-1999

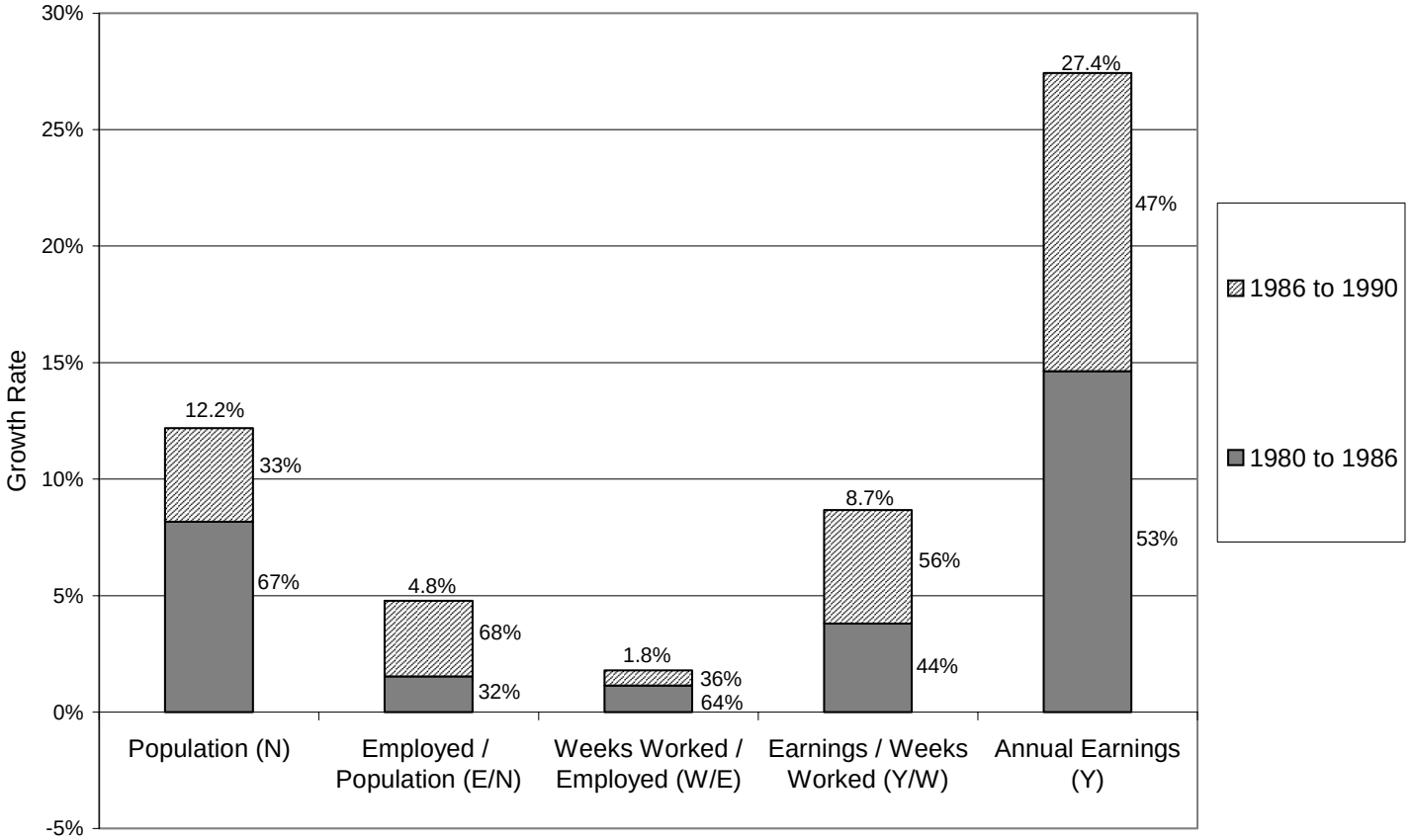


Based on civilian population, age 16 and over. Earnings are deflated by the PCE price index.
1980 refers to the period of July 1979 to June 1980.
Each group's share of the contribution to growth is given to the right of the bars.

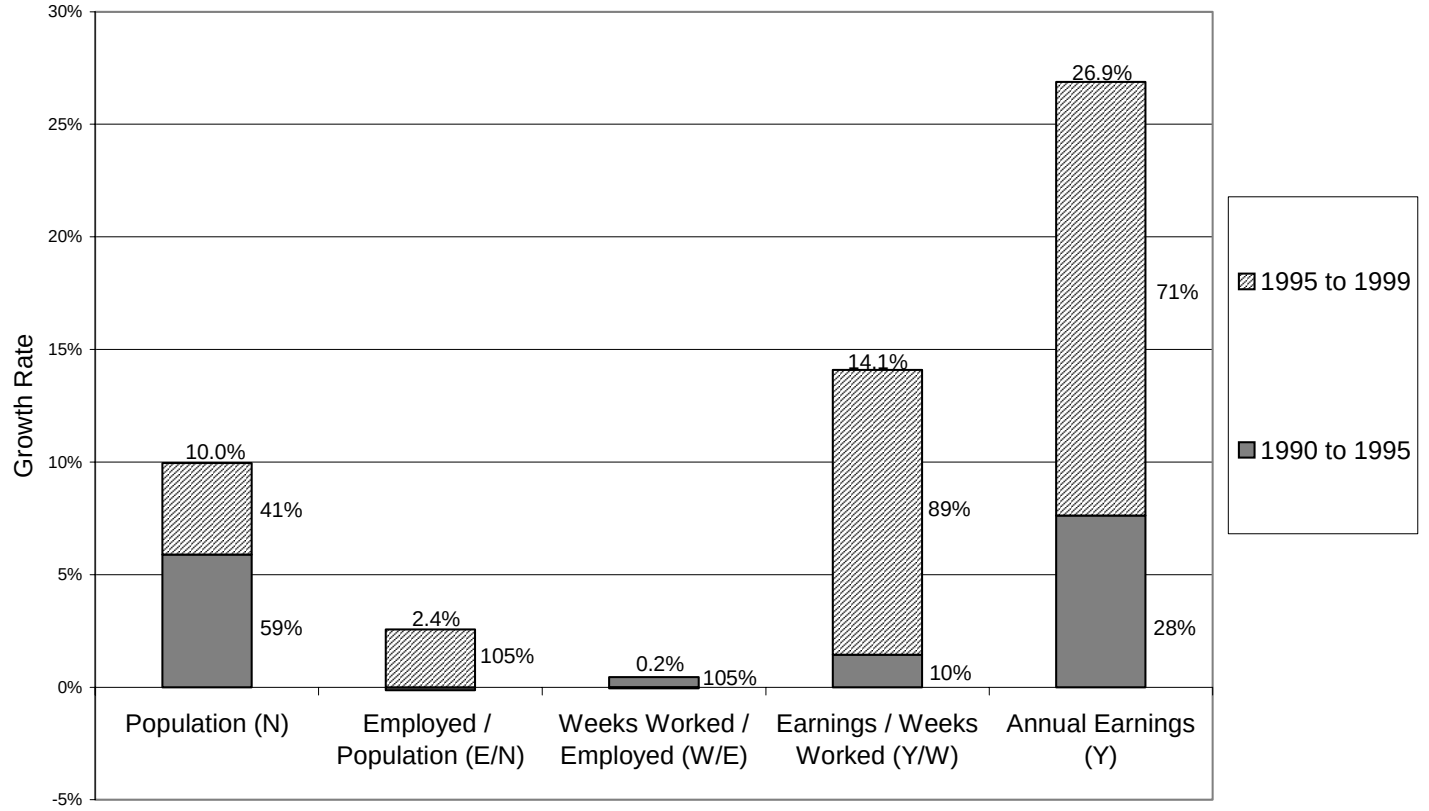
Figure 8

Contributions to Real Earnings Growth and Its Components: Time Period

A: 1980-1990



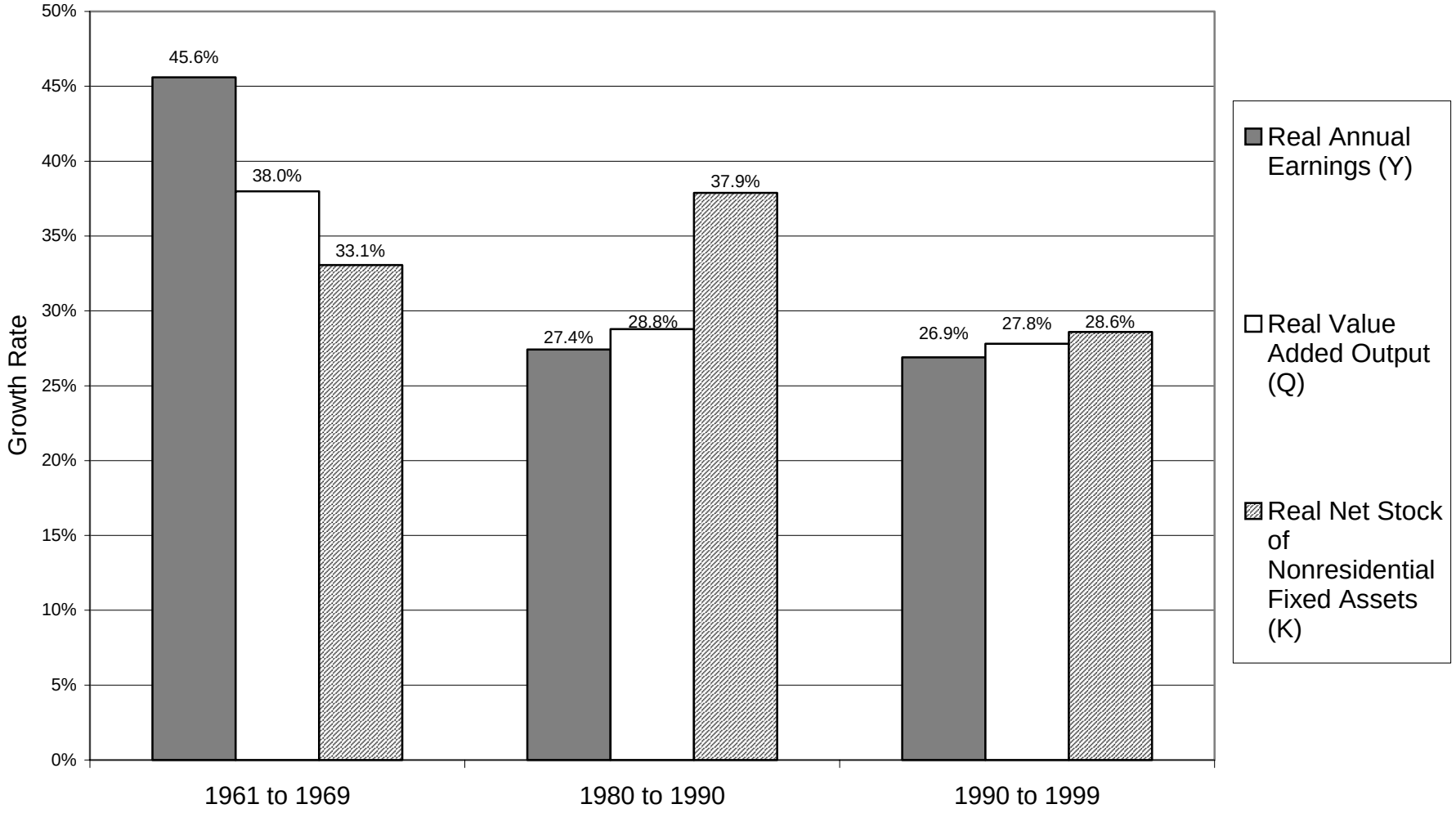
B: 1990-1999



Based on civilian population, age 16 and over. Earnings are deflated by the PCE price index.
1980 refers to the period of July 1979 to June 1980.
Each time period's share of the contribution to growth is given to the right of the bars.

Figure 9

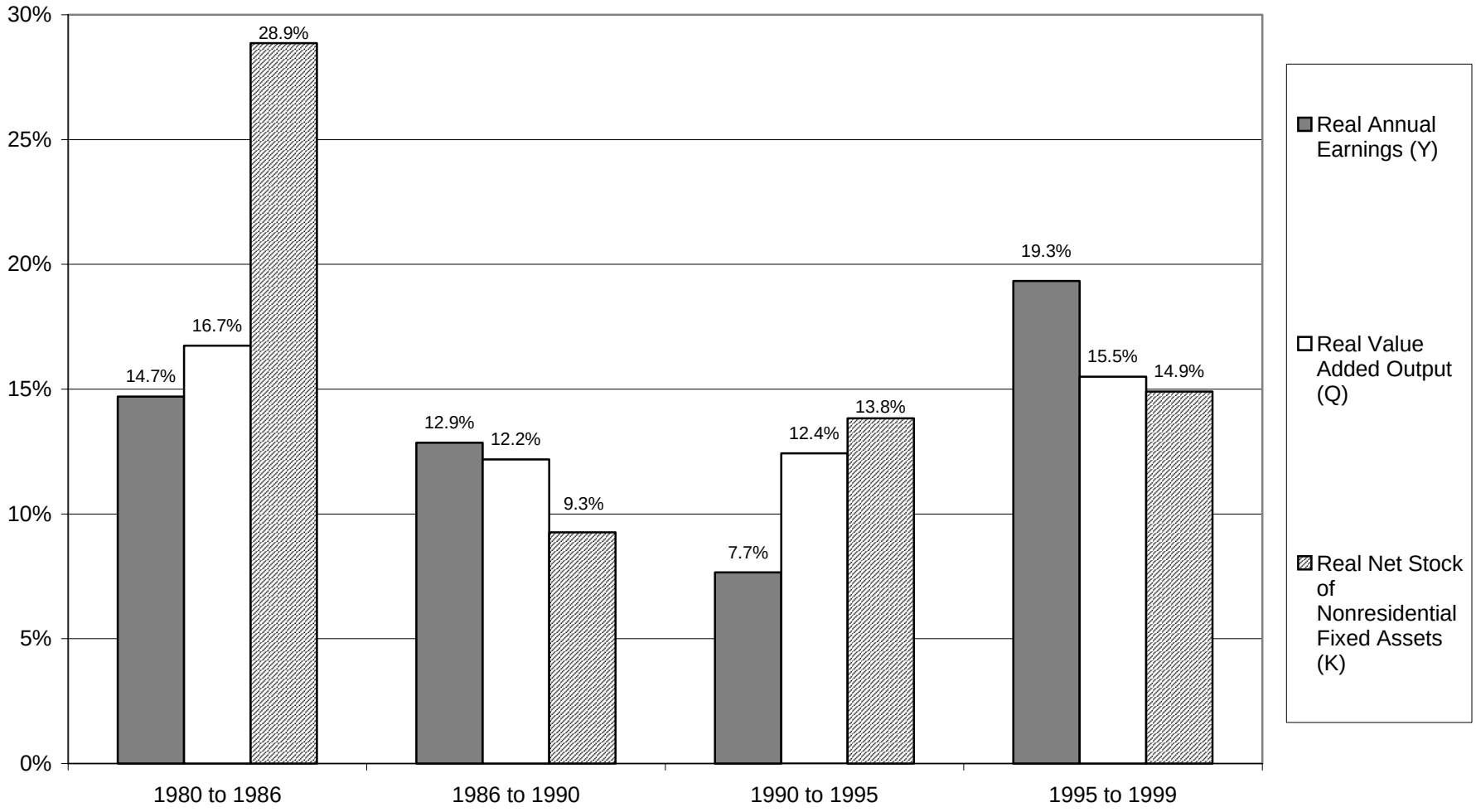
Growth in Real Earnings, Production, and Capital: Three Expansions



1960s growth in Q is calculated as percent change in real GDP.
1980 refers to the period of July 1979 to June 1980.

Figure 10

Growth in Real Earnings, Production, and Capital: Timing Within Expansions



Based on civilian population, age 16 and over.
1980 refers to the period of July 1979 to June 1980.