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The unmeasured labor force: The growth in work hours

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The Jerome Levy Economics Institute of Bard College

Public Policy Brief

The Unmeasured Labor Force

The Growth in Work Hours

Barry Bluestone and Stephen Rose

LEVY INSTITUTE

No. 40, 1998

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Summary

Economic theory had long held that when unemployment rates are low, wage pressure increases and inflation soon follows. But the current state of the American economy—low unemployment and low inflation—seems to indicate that economists are wrong. Research Associate Barry Bluestone and Stephen Rose, of the Educational Testing Service, argue that the problem is not the theory but the method used to measure labor supply.

The unemployment rate is the traditional measure used by economists and policymakers to determine the tightness of the labor supply—the lower the rate, the tighter the labor market. Bluestone and Rose assert that a better measure of labor supply is the number of hours that people work. Others have taken this same approach, but the authors find that some measures of hours worked, such as the Current Population Survey, have not been entirely accurate. Using data from 1967 to 1989 that were collected by the University of Michigan's Panel Study of Income Dynamics and controlling for the effects of the business cycle, Bluestone and Rose find that Americans are working more hours now than they were two decades ago. At the same time their continuity of employment and connection to a long-term employer have decreased. This increased job instability and stagnating wages have made Americans willing to work extra hours and extra jobs at their current pay rate in order to build up nest eggs as protection against possible unemployment in the future.

This is true not only for individual workers, but also for families in which both husband and wife work. By 1988 prime-age working couples were putting in an average of 3,450 hours per year in combined employment, up from 2,850 hours two decades before. Bluestone and Rose find, however, that families are experiencing only modest income gains from their additional labor. For prime-age working couples as a group the increased work hours produced an increase of only slightly more than 1 percent per year from 1973 to 1988 in their material standard of living.

Bluestone and Rose conclude that it is unlikely that the current low unemployment rate will result in inflation because the labor market is not as tight as the unemployment statistics indicate. Current workers make up a largely unmeasured source of labor. Since they appear quite

willing to take on additional work, employers are in little danger of facing labor shortages. The authors see no sign of abatement in factors that contribute to worker insecurity—current trends in global competition, technological change, weakened labor unions, and industry deregulation. Therefore, the upward trend in hours worked is likely to continue, and this means that economic growth can continue without risk of inflation.

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Preface

As of April 1998 the official unemployment rate was at its lowest point since February 1970—running at 4.3 percent. With the rate that low, this should have been a good year for those seeking employment, including many former welfare recipients. At the same time, it should have been a worrisome year for those concerned that low unemployment will result in tight labor markets, leading to upward wage pressures and thus to inflation. But the reality is that employers have not been experiencing a shortage of labor and have not felt the pressure to raise wages as might be expected.

Despite this incongruity between the official statistics, inflation rates, and the apparent state of labor markets, many policymakers, especially members of the Federal Reserve Board, continue to have faith in a tenet of economics that says that the economy cannot experience low unemployment and low inflation simultaneously. Each time the unemployment figures show a decrease, discussion turns toward policies that would slow the economy and reduce employment opportunities.

The belief that the official unemployment statistics reflect the true degree of tightness of the labor market is used to buttress the push to reduce welfare expenditures by requiring that more recipients get a job. If jobs are plentiful, welfare recipients ought to be able to find one. Barry Bluestone and Stephen Rose take a close look at the American worker and argue that the reality does not match the official unemployment statistics. Despite the low official unemployment rate the labor market is not tight because already employed workers are working more hours and at their current wage rates as the demand for labor expands. Corporate downsizing and the massive layoffs that resulted are fresh in the minds of American workers and they fear losing their job. This insecurity makes

them reluctant to ask for wage increases and leads many to work extra hours to build a financial cushion. The employment picture is not much better for prospective workers. Welfare recipients seeking work are finding that jobs are not plentiful; employers can hire from a pool of current workers, many of whom have more experience than the unemployed welfare recipients.

If the picture painted by Bluestone and Rose is much closer to the true situation than that indicated by official unemployment rates, then, as they argue, the debate that has preoccupied policymakers regarding whether or not the economy should be slowed to prevent inflation becomes meaningless. It is difficult to say at this point whether or not there can be both low unemployment and low inflation for a longer extended period because the labor market is not yet tight enough to cause any wage pressure. What is known, according to Bluestone and Rose, is that the current labor market does not justify policies that will limit employment opportunities.

Dimitri B. Papadimitriou

Executive Director

May 1998

The Growth in Work Hours

By April 1998 the official unemployment rate reported by the U.S. Bureau of Labor Statistics (BLS) was 4.3 percent, the lowest rate since February 1970. Not since the era of President Richard Nixon had the jobless rate been this low. The BLS also reported that unemployment had remained at or below 5 percent for 13 months running. Not long ago most economists would have considered such an unemployment record impossible to achieve, or at least impossible without igniting an explosive cycle of wage-led inflation. Yet prices have remained under control. During the past three years the consumer price index has risen only 2.6 percent a year—less than half the average annual inflation rate of the 1980s. Moreover, instead of accelerating as the jobless rate dropped, monthly price increases in 1997 were smaller than in the preceding year. In the first quarter of 1997, when the economy was growing at a red-hot 4.9 percent annual rate, inflation was trending downward toward 2.3 percent.

Such a sanguine unemployment-inflation environment has forced economists back to the drawing boards to try to figure out why reality has seemingly so conspicuously trumped economic theory. As Steven Pearlstein (1997) reports, “A decade ago, if you’d predicted [this] kind of economic development, many economists and business leaders would have laughed.” Federal Reserve Board chairman Alan Greenspan, in his biennial report to Congress in July 1997, proclaimed that the current state of the economy was superb. He conceded that, despite the official low unemployment rate, there were no signs of inflation on the horizon.

Many business writers have been forced to abandon the old orthodoxy and talk of a “new paradigm” in which rising inflation is no longer set off

by unemployment rates as low as 5 percent. Since this is uncharted territory, no one knows how low the unemployment rate can go and still not cause prices to rise. Is it 4.5 percent? Or 4.2 percent? Or perhaps even 4.0 percent? Some analysts have noted that some states and regional labor markets have maintained local unemployment rates of 4 percent or less without any signs of upward wage pressures.

There is no end to speculation about the causes of this new benign economic climate. Improved productivity, particularly in manufacturing, is given credit for helping to keep a lid on prices. Output per hour in the goods-producing sector has been growing at nearly 3 percent a year since 1989—a level nearly half again as large as during the 1970s and equal to the rate during the “golden years” of the 1960s. This has helped contain costs in many industries. In some industries prices are even falling.¹ A decline in transportation costs is another factor. While freight volume continues to grow, its cost as a percentage of GDP has fallen from about 7 percent in 1990 to under 6 percent today. This is due in part to the rapid diffusion of high-tech equipment throughout transportation industries. The use of electronic scanners for tracking shipments and of more fuel-efficient trucks, locomotives, and aircraft has reduced the cost of transporting goods and thereby the final cost of producing and distributing them (Matthews 1997).

Most surprisingly, other services (outside of transportation) are doing their part in keeping prices down. Until recently economists believed that service sector price increases were inevitable because of “Baumol’s disease,” a reference to the theoretical work of New York University economist William Baumol. In the 1960s Baumol (1967) postulated that the rate of inflation would tend to increase over time as the economy moved into the postindustrial age and services became a larger part of national output. This increase would occur because services, unlike manufacturing, are essentially labor intensive and presumably cannot count on automation to boost productivity. After all, how can anyone boost the efficiency with which the New York Philharmonic plays Beethoven’s Ninth?

Today the “cost disease” in such sectors as health care, education, and even legal services is proving susceptible to treatment, if not cure, by new medical and educational technologies and by information technologies more generally. The inflation rates for housing, medical care,

college tuition, and auto insurance are all on a downward path.² Prices in the nonenergy services sector as a whole rose by only 2.3 percent in 1996. By comparison, the lowest rate of increase at any time during the 1980s was 4.7 percent. Michael Mandel (1997b) reports that nearly 70 percent of the entire drop in inflation since 1986 has come from services, a rather startling finding given that manufacturing is usually credited with keeping inflation at bay.

All of these factors clearly play a role in creating the present low-unemployment–low-inflation environment. But we believe there is something much deeper at work. It has to do with how the expansion of global markets, the deregulation of key industries, the weakening of labor unions, and corporate downsizing have fundamentally changed the structure of labor supply. These factors have generated a greater sense of job insecurity and stagnating or, in many cases, declining family income. Even Alan Greenspan has alluded to this phenomenon, suggesting that prices have been held in check because workers have forgone wage hikes for job security and unions have increasingly pledged themselves to five- and six-year contracts in an attempt to lock in job security at the expense of higher wages (Greenspan 1996).

We think that the Federal Reserve chairman is largely correct; job insecurity is a critical factor, often overlooked in the past. But the mechanism that links job insecurity (and stagnating incomes) to price stability has less to do with union contracts than with a fundamental shift in the nation's "labor supply regime." This policy brief will present evidence that increased job insecurity and stagnating incomes have kept inflation in check by creating a situation in which an increase in the demand for labor as the economy expands is met by an increase in the supply of labor *from incumbent workers*, that is, from workers who are already employed. The key point is that in this new labor supply regime Say's venerable law, "Supply creates its own demand," has been turned on its head to become "Increased demand creates its own supply." In the face of heightened job insecurity and declining income, workers now toil as many hours as possible when jobs are plentiful in anticipation of downsizing and job loss—and they do so at existing wage rates. Moreover, declining hourly wage rates, even in the absence of job insecurity, have forced millions of families to increase their combined hours of work simply to maintain their annual income. *This relieves a significant labor supply constraint that normally accompanies low official unemployment rates.*

Instead of having to raise wages to attract more workers, firms have increasingly been able to fill their additional need for labor by employing their own workers longer or by offering second jobs to workers who are employed elsewhere. This is far different from the labor supply regime of the 1970s in which economic growth depended much more on coaxing additional workers into the labor force—a practice that historically had required offering higher wages.

Significant policy implications follow from these findings. This new source of labor supply has essentially dampened inflationary pressure in the overall economy, permitting the economy to grow at rates not formerly considered feasible. Unemployment rates below 5 percent—perhaps even in the 4 percent range—can be maintained without serious inflation. Because official unemployment statistics do not reveal the increase in hours worked by incumbent workers and thus do not detect a shift in the labor supply, the Federal Reserve Board should shy away from according much weight to such statistics in setting monetary policy. Until workers realize significantly higher hourly pay rates and experience greater employment security, the upward trend in weekly and annual work hours is likely to continue, sustaining the benign unemployment-inflation environment.

This brief has four sections. First, we review the logic and original evidence for the Phillip's curve and for the NAIRU (the nonaccelerating-inflation rate of unemployment)—the conventional explanations for the trade-off between inflation and unemployment. In the second section we review the debate over whether American workers are putting in more hours at work. In the third we rely on longitudinal data to show that individual workers are increasingly having more ups and downs in their employment history. Finally, in the fourth section we provide a range of policy implications we believe follow from the evidence we have presented regarding the historic shift in labor supply regime.

The NAIRU and the Labor Supply Curve

Until quite recently economists' pessimism about the potential for simultaneous low unemployment and low inflation was based on a particular model of labor market behavior. Unused capacity in the workforce was thought to be virtually exhausted at "low" official unemployment rates.

With fewer workers seeking jobs, employers seeking additional staff have to raise wages in order to coax workers to leave other firms to join theirs. And workers, with confidence in their ability to find work elsewhere and to find more remunerative work, pressure their current employers for higher pay. When enough workers do this and employers capitulate to their demands, firms are forced to raise their prices to cover the added costs—or see their profits erode. Rising prices motivate workers to ask for additional wages to maintain their purchasing power. In many union contracts, “cost-of-living adjustments” (COLAs) automatically do this. Left unchecked, an overheated economy generates sufficient upward price pressure to undermine profit rates and stock market prices. In turn, investment begins to shrink and the economy heads into a tailspin.

In this way, inflation leads ineluctably to its opposite—recession. The wage-price spiral begins with unemployment below its “natural rate.” Prices then rise at ever faster rates until stable corporate planning can no longer be maintained. As firms cut back on production and lay off personnel, unemployment grows and workers begin to experience job insecurity. Lower production and the growing inability of workers to win wage increases finally undermine inflationary pressures. The slowdown ultimately lays the seeds for a recovery, but not without large losses in output and income.

To forestall a much deeper recession, the Federal Reserve Board is supposed to resort to preemptive action, raising short-term interest rates to slow the economy and nudge unemployment rates back up into a “safe” zone. The Fed action, if done right, is seen as something like a vaccination: a small dose of a pathogen builds up immunity to a virulent infection. If it is assumed that low unemployment rates are a good indicator of inflation-generating tight labor markets, then such Fed action can be justified as a deliberate intervention to moderate the cycle of inflation and recession. We may not like the idea that a reserve of 7 to 8 million unemployed workers is needed to moderate the business cycle, but the presumed alternative of recurrent bouts of hyperinflation and double-digit unemployment is viewed as considerably more threatening.

This concept of a “natural rate” of unemployment was first introduced by Milton Friedman (1968) and almost simultaneously by Edmund Phelps (1968). Its more formal name, the “nonaccelerating-inflation rate of unemployment,” or NAIRU, suggests that below some “natural”

unemployment rate increases in aggregate demand will result not simply in price increases, but in *accelerating* rates of inflation. Early estimates of the NAIRU, based on experience in the United States from 1960 to 1990, placed the natural rate in the neighborhood of 6 percent. Any attempts to keep unemployment below this level were expected to have dire consequences.

Ever since the concept of the NAIRU was first propounded, it has been criticized on both theoretical and statistical grounds. In recent work, Robert Eisner (1996) demonstrates a significant asymmetry in the NAIRU. He finds that while unemployment above the NAIRU has historically lowered inflation in the United States as the theory suggests, rates below the NAIRU have not necessarily led to rising inflation. Hence, the natural rate hypothesis itself is open to dispute. Others, including Robert J. Gordon (1997) and Douglas Staiger, James Stock, and Mark Watson (1997) conclude that a NAIRU exists, but it varies over time. In analyzing the period 1955 to 1996, Gordon concludes that the time-varying NAIRU drifted downward from 6.2 percent in the late 1980s to 5.7 percent in the mid 1990s. Staiger, Stock, and Watson also find a decline in the point estimates of the NAIRU from 6.8 percent in 1984 to 5.9 percent in 1994 as well as a large standard error around the estimated point estimates.

The key point, however, is that in all of these cases the variable of note is the official unemployment rate and inflationary pressures are still thought to be forthcoming at unemployment rates well in excess of 5 percent. Members of the Federal Reserve Board have indicated that they consider many factors in addition to the official unemployment rate in gauging potential inflationary pressure in the economy, including the extent to which physical capital is being utilized and the degree to which the stock market may be overvalued. Still, the official unemployment rate is clearly the single indicator of unused capacity that receives the most attention.³

Fighting the Last War

What has motivated Fed policy during the past two decades is a steadfast vigilance against any possible recurrence of the violent business cycle that pummeled American families and businesses during the late 1970s and early 1980s. The annual rate of increase in the consumer price index

rose from 5.8 percent in 1976 to an unprecedented 13.5 percent in 1980 as unemployment fell from 8.5 percent in 1975 to 5.8 percent in 1979. Back then the Fed, under newly appointed chairman Paul Volcker, raised interest rates deliberately to crush inflation, slowing the economy to the point where, in December 1982, the national unemployment rate reached nearly 11 percent. Since no one wants to live through that terrible experience again, the low unemployment rates over the past two and half years are viewed with some real concern. The historical record seems to provide a signal that we have crossed over into the danger zone where a tight labor market will lead to an explosive wage-price inflationary cycle.

But will it? If a 4.6 percent jobless rate connotes the same degree of labor market tightness as it did in the 1970s, then we are almost surely in for another bout of serious inflation unless the Fed applies the monetary brakes. On the other hand, *if the unemployment rate is no longer a reliable measure of the remaining store of unutilized labor*, then it may be safe to ignore the unemployment rate and allow the economy to grow without attempting to moderate it. The danger may lie in “fighting the last war,” a reference to how veteran generals have pursued new wars using the outdated lessons from what went wrong in the last.

Data on the past three business cycle expansions suggest that a labor regime shift has occurred. In Figure 1 we have plotted the inflation rate against the unemployment rate. For each of the three expansions (1975–1979, 1982–1989, 1992–1996), the data series begins in the year in which the unemployment rate reached a cyclical peak and is followed until the jobless rate bottoms out.

As the figure demonstrates, the trade-off between unemployment and inflation has improved markedly since the 1970s. Inflation then was running in excess of 6.0 percent a year even with 7.5 percent of the labor force unemployed. As the unemployment rate came down, the inflation rate rose sharply in a clear Phillip’s curve pattern. Tightening labor markets plus pent-up price pressures from the abolition of Nixon era wage and price controls plus the second oil shock of the decade drove inflation to record levels as the unemployment rate fell below 6.5 percent.

The trade-off during the 1980s recovery was much more benign. During the entire expansionary portion of the cycle, inflation remained below

Figure 1 Unemployment-Inflation Trade-off, Selected Economic Recovery Periods



Note: Unemployment rate in period t plotted against inflation rate based on CPI-U in period $t + 1$.

Source: Council of Economic Advisers, *Economic Report of the President*, February 1997; "Economic Indicators," October 1997.

1970 rates and the entire unemployment-inflation pattern was generally flat until unemployment fell below 6.5 percent. In the current recovery, there is hardly any hint of a trade-off. *Even at jobless rates below 6.0 percent, there does not appear to be a Phillip's curve at all.* This is what has economists stumped. History does not appear to be repeating itself as the unemployment-inflation relationship seems to be fundamentally shifting. It is time-varying as Gordon suggests, but we are not finding much price pressure even at unemployment rates well below his estimated NAIRU of 5.7 percent.

Measuring Labor Market Supply

The problem, we believe, lies less in the theory underlying the NAIRU and more in the data used to estimate it. Essentially, the Phillip's curve—the trade-off between unemployment and inflation—has been shifting downward and flattening out not because the curve has ceased to exist, but because the official unemployment rate is at best a proxy for labor supply conditions and increasingly a poor one. A given unemployment rate in the 1990s does not signal the same degree of "tightness" in labor supply as the same rate did in the 1970s. The relationship between

unused labor supply and inflation may still hold, but one can no longer rely on the official unemployment rate as a reliable measure of unused workforce capacity. Very tight labor markets may still lead to wage-price pressures, but even a 4.6 percent unemployment rate may no longer be an indication of such labor market conditions.

In its more technical work, hardly ever reported by the media, the BLS admits the official unemployment rate is only one of many measures of labor utilization. Indeed, each month the agency calculates a range of unemployment rates, each including one or more groups of individuals who are potentially available for work but are not officially unemployed. These underutilized workers include those who are working part-time involuntarily, who are “discouraged” and have given up looking for a job, and who were previously looking but gave up because of the press of family responsibilities or other reasons. Presumably many of these individuals would be ready to go back to work if an appropriate job suddenly became available. Labor force participation, in this case, is a positive function of job availability. If somehow there are more jobs, there will be more labor supply to fill them. The greater the elasticity in labor force participation, the more inaccurate is the official unemployment rate as an indicator of remaining unused labor supply.

But there is an even more fundamental reason why relying on the standard jobless rate can be misleading. Measuring the true supply of labor involves more than counting the number of people working or prepared to work, as the official measure does. The *number of hours* incumbent workers put in on the job can be just as important as the number of employed workers. This is completely overlooked in the official statistics because the BLS counts anyone working *one hour or more* for pay as in the labor force and employed. If incumbent workers increase their hours of work, it is irrelevant to the unemployment rate—but hardly irrelevant to the level of labor supply. A 1 percent increase in the number of hours worked per worker for a fixed supply of labor is mathematically equivalent in terms of labor supply to a 1 percent increase in the number of workers; from the perspective of workforce capacity the two are equivalent. Moreover, since incumbent workers normally have higher productivity than new workers brought in from the end of the hiring queue, increased labor supply from existing employees will boost economic growth more than an equivalent amount of labor supplied by new labor force entrants.

Sources of Labor Supply in the New Labor Market

If average work hours remained reasonably fixed over time, the unemployment rate would be a good proxy for overall labor supply. But this has not been the case, as we shall demonstrate. The nature of working time is changing. A larger and larger proportion of the workforce deviates from working a “standard workweek” and “standard workyear.” One in six workers now report working part-time schedules, with one-quarter of these doing so involuntarily—a sign of “underemployment.” At the same time, over one in fifteen now report working at two or more jobs, and many seek as much overtime as is offered them.

The growing importance of work hours as a factor in total labor supply is revealed in Table 1. Here the total number of additional hours supplied to the labor market during the past three expansionary cycles is decomposed into four factors: (1) growth in the civilian population age 16 and above (2) increase in labor force participation (3) decline in the unemployment rate through the return of unemployed workers to work, and (4) increase in average hours worked per worker per week.⁴

According to this analysis, somewhere between two-fifths and one-half of the additional hours worked during the past three expansionary periods was supplied as a result of simple population growth. This increase in supply is, of course, independent of the business cycle. The contributions

Table 1 Sources of Additional Hours of Work (percent)

Source	1975–1979	1982–1989	1992–1995
Growth in civilian population age 16 and above	51.0	41.4	46.7
Increase in labor force participation rate	27.2	19.7	4.7
Decline in unemployment rate	19.7	24.6	32.0
Increase in average hours worked per week	2.2	14.2	16.6
Total increase in hours worked ^a	100.0	100.0	100.0

^aTotals do not add up to 100.0 because of rounding.

Source: Council of Economic Advisers, *Economic Report of the President* (Washington, D.C.: Government Printing Office, 1987; 1997); special tabulations on hours from Current Population Survey data.

of the other three elements, however, vary over the cycle and have varied rather dramatically in their relative importance from one period to the next. More than one-fourth of the additional hours worked in the 1970s can be attributed to the increase in labor force participation. By the 1990s this source accounted for less than 5 percent of the total additional hours. After decades of rising participation rates, particularly as a result of increased participation by women, the trajectory reached a plateau in the first years of the current recovery. It began to grow again at a faster pace only in 1996 and 1997.

In sharp contrast, the role of declining unemployment and, even more importantly, the role of increasing average weekly hours have grown remarkably over time. In the late 1970s less than one-fifth of additional work time was due to workers' being called back to work from unemployment. By the 1990s this factor accounted for nearly a third of the addition to total work time. The increased contribution from longer workweeks was even more significant. In the 1970s practically none of the total increase in work time was due to existing workers' putting in more hours. By the 1990s fully one-sixth of the additional labor supply came from incumbent workers.

Together, the combined contribution of unemployed workers returning to work and incumbent workers putting in longer workweeks now accounts for *nearly half* of the increased labor supply that is sustaining noninflationary economic growth in the early 1990s. Back in the 1970s these two factors accounted for only about *one-fifth* of the total—the rest coming from new labor force participants. This is the essence of the labor supply regime shift. We are now obtaining additions to labor supply more from experienced workers than from new labor force recruits and a good share of this added supply is forthcoming when the official unemployment rate signals little slack in the economy.

The “Backward Bending” Supply Curve

It is reasonable to ask why we are now seeing so much more labor effort forthcoming from incumbent workers. A combination of standard labor supply theory and the current environment of stagnating wage rates and heightened job insecurity explains a large part of this behavior.

By tradition, we normally draw the supply curve for labor as upward sloping, as we do the supply curves for goods and services. But the labor supply curve is, in fact, fundamentally different and can actually bend backward. The offer of higher wages can, under realistic conditions, reduce the supply of labor and lower wages can increase it. This is well known among labor economists and is due to the fact that supply is influenced by both income and substitution effects.

Increases in income *per se* (that is, increases in income but not necessarily in wage rate) induce a worker to consume more leisure, thereby reducing the willingness to work. This is the income effect.⁵ Where an increase in income comes as a result of an increase in pay rate, there is both an income effect, because the higher wage rate provides a higher income at the same hours of work, and a substitution effect, because an hour of leisure is now more expensive. An additional hour of leisure can be purchased only at the higher price of the forgone income from the new higher wage rate. The income effect leads the worker to work less, while the substitution effect leads the worker to want to work more. Depending on the relative strength of the two effects, an increase in the wage rate can increase labor supply, reduce it, or leave it unchanged.

Normally, we think of the substitution effect as dominating the income effect. This is what gives us the usual upward-sloping labor supply curve and the expectation that higher wages are needed to coax out more labor from “leisure” time activities. There are at least two cases, however, in which it is possible to obtain increased labor supply without a concomitant increase in wage rates. The first involves “target income” or “target consumption” behavior; when individuals work in order to meet a fixed income or consumption level, labor supply will be *inversely* related to the wage rate. Offered a higher wage, a worker will cut back his or her hours, taking the gain in the form of leisure. In this case, there is a pure income effect. Similarly, if the wage rate falls, the worker will have to work more hours to compensate for the lower pay rate. Hence, stagnating or falling wages in the face of fixed mortgage payments, car payments, and outstanding credit card balances will force workers to put in more hours at work, not less.

The second case involves job insecurity, or at least the expectation of job instability. Assuming that individuals have some long-run income objective, they will attempt to set aside a cushion against future loss. Hence, if

workers fear a future layoff or involuntary part-time hours, they might attempt to increase their current work hours to compensate. Overtime work and “moonlighting” are a form of income insurance for workers facing potentially unstable work futures. They may be willing to work all the hours they are offered at their current wage rate or may take on second jobs at current or even lower wage rates in order to accumulate income reserves. When jobs are plentiful, such individuals will be there to supply the additional hours, even at existing pay rates.

It is precisely this type of labor force behavior that can help explain the change in labor supply regime we have identified. *The preconditions for a backward-bending labor supply curve have been developing for the past quarter century.* Real hourly wages of production and nonsupervisory workers peaked in 1973. Since then, they have declined from \$8.55 (in 1982 dollars) to \$7.43 in 1996 (Council of Economic Advisers 1997). Even with the recent recovery, wages have continued to stagnate. Between 1991 and early 1997 the real average wage rose a total of just 2¢ per hour. In such a long-term wage climate, target income behavior is likely.

Similarly, there is evidence that job insecurity is on the rise. Greenspan cites, for example, a time-series survey of workers carried out at 444 large companies by the International Survey Research Company (reported in *The New York Times*, February 27, 1997, B6). In 1986 only 20 percent of respondents were “frequently concerned about being laid off.” Less than 24 percent of those working for these companies were frequently worried about job loss even during the deep recessions of the 1980s. Ten years later the comparable figure was 46 percent. It is not unlikely that workers who feel such insecurity will feel pressure to take on added work *when it is available* and will be willing to do so even at their current wage rate. Again, we have Say’s law in reverse and the conditions for non-inflationary growth at low recorded unemployment rates.

But how much have the hours of work of incumbent workers actually increased and who is supplying them? Is the change in supply sufficient to permit us to declare a shift in labor supply regime? Do we have any evidence that changing work time is related to trends in wages and earnings? What do we know about trends in job instability and possible working time responses to them? To answer these questions, we review recent studies of working time and develop a new analysis based on longitudinal and cross-sectional data. The results provide direct proof of a

sharp increase in working time since the early 1980s and a good deal of circumstantial evidence ties the increase to stagnating wages and increasing job insecurity.

Is Average Working Time Rising or Falling in the United States?

In an earlier paper, we put forth the claim that Americans are both “overworked” and “underemployed” (Bluestone and Rose 1997). Our research was initially motivated by the debate set off by Juliet Schor’s book *The Overworked American*, in which she estimated that Americans worked an average of 163 more hours a year in 1990 than they had in 1970—the equivalent of nearly an extra month of full-time work (Schor 1991). Men were working an average of two and a half more weeks per year and women an average of seven and half more weeks. This increase reversed over a century of declining working time. American workers were now working more per year than workers in any other advanced country.⁶

Many researchers criticized Schor’s view, citing other labor market indicators that seemed to signal that working time was really decreasing. For example, employer surveys—the very ones the Bureau of Labor Statistics uses to measure working time when it reports the monthly unemployment rate each month—show weekly hours in manufacturing and weekly hours in the rest of the economy going in opposite directions. It is true that the use of overtime is becoming the norm in much of manufacturing, but manufacturing seems to be the odd man out. For all industries taken together, the number of weekly hours on the typical job has been shrinking steadily since World War II.

Much of this shrinking is due to the growth in employment in non-standard work arrangements. In such sectors as retail trade part-time hours are common, and one of the fastest growing employment sectors over the last 15 years has been temporary help. Part-time jobs, the increased use of “contract employees,” and other forms of “contingent” work are largely responsible for the reported shortening of the workweek (Belous 1989; Tilly 1996).⁷ The growth in nonstandard work might seem to

confirm the perception from employer surveys that average weekly hours are declining, but just the opposite might be true. Average hours per worker could be rising because incumbent workers are taking on part-time, contingent, and temp work in addition to their current employment.

New Estimates of Working Time

The foregoing suggests that because some Americans are putting in very long hours and others are facing underemployment as a result of part-time and contingent employment, the trend in average work time could go in either direction. There is a lively statistical debate over what is actually happening to working time in America.

Using data from the Current Population Survey (CPS), Larry Mishel and Jared Bernstein (1994) have re-estimated annual work hours for various years. Their research confirms Schor's finding of increased annual work hours, but for a comparable period (1973 to 1992) their estimate is only three-fifths as large as her 163 hours. They calculate that in 1973 the average workweek (for employed and self-employed workers in public and private sectors) was 38.4 hours. The average workyear was 43.2 weeks, yielding an estimate of 1,659 hours of work per year. By 1992 the average workweek had climbed by 0.6 hours and the average workyear by 2.0 weeks. Hence, average annual hours had risen to 1,759, an increase of 100 hours, or 6 percent. Three-quarters of the increase, they estimate, can be attributed to more weeks worked per year, one-quarter to increased hours per week.

While Mishel and Bernstein's estimates are more modest than Schor's, they clearly support the "overworked American" thesis. But critics argue that the survey data used by Schor and by Mishel and Bernstein are unreliable. Their estimates of hours worked are based on the March CPS for each year. Among several dozen questions about labor market activity, respondents are asked to report "hours worked last week" and "usual weekly hours of work last year," and they have only a short time to answer all the questions. Critics believe that in making what may be a wild guess, particularly for those whose hours vary substantially from week to week, respondents guess high. And the more they say they work, the higher they guess.

An alternative measure of working time is procured from special studies that ask respondents to keep a 24-hour diary of everything they do over a one- to two-week period (Robinson and Bostrom 1994). Such time diary surveys were first carried out by the University of Michigan Survey Research Center in 1965 and 1975 and then again by the University of Maryland in 1985.⁸ Diary entries are considered more reliable than CPS surveys because respondents are required to account for every minute of the time segment they are asked to audit, formal work time is not singled out for special attention, and the recall period is at most one or two days.

John Robinson, of the University of Maryland, and Ann Bostrom, of Georgia Tech University, found that the gap between hours reported using CPS-type questions and the hours reported in diaries increases as the number of reported hours of work rises. Among those reporting between 20 and 44 weekly hours, the estimates were only slightly higher than the diary entries. Among workers claiming to “usually” work more than 55 hours per week, the gap was 10 hours or more per week. Values of the CPS-diary difference were generally higher among women than men. Robinson and Bostrom conclude that “the diary data suggest that only rare individuals put in more than a 55-60 hour workweek, with those estimating 60 or more hours on the job averaging closer to 53-hour weeks.” These results imply that Americans are not as overworked as CPS estimates suggest.

How can we reconcile the Schor and the Mishel and Bernstein findings with the Robinson and Bostrom findings? A large part of the answer lies in the fact that Schor and Mishel and Bernstein are looking at annual hours of work and most of the increase in hours is due to increases in weeks worked, not hours worked per week—the focus of Robinson and Bostrom’s diary studies. As we reported above, Mishel and Bernstein found that about three-fourths of the increase in annual hours of work is accounted for by increased weeks of work—a factor ignored in the diary studies.

But even accounting for this, the issue of working time remained unresolved. To subject the “overworked American” hypothesis to another attempt at empirical verification, we decided to investigate the issue with still a third set of data—the longitudinal Panel Study of Income Dynamics (PSID).

New Estimates Using the Panel Study on Income Dynamics (PSID)

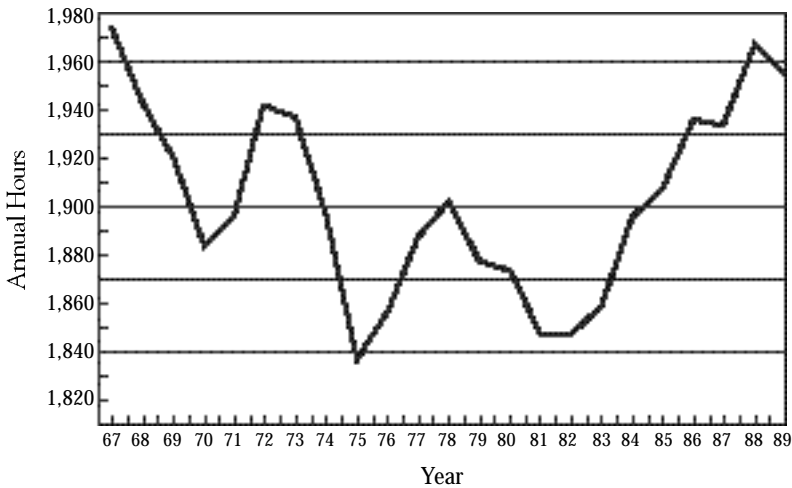
The Panel Study of Income Dynamics (PSID) is an annual survey collected by the University of Michigan Survey Research Center since 1968. Instead of a snapshot that is supposed to reflect the overall population in different years, the PSID has been surveying the same families year after year. Part of its standard labor market section is a series of questions used to ascertain annual hours of work. The survey asks each respondent to recall how many days he or she was on vacation, sick leave, strike, or leave due to other family members' illness. It asks questions about regular hours of work per week and weeks worked on the respondent's main job and on up to three other jobs held during the year. All of this information is combined to yield an estimate of annual work hours. Although the PSID survey suffers from recall problems as does the CPS survey, the greater detail on each job and annual working time presumably permits better estimates than can be obtained from the CPS survey.

These data can be used in two fashions. First, we can compute estimates of yearly working hours. Second, the longitudinal aspect of the PSID allows us to trace year-to-year variations for individual workers over a 10-year period. Further, because the PSID started in 1968, we can compare the history of working time during two 10-year periods—the 1970s (1969–1979) and the 1980s (1979–1989), each encompassing two complete business cycles. Demographic information is available so that we can track trends in annual work hours for families and individuals, for men and women, for whites and blacks, and for segments of the population with differing amounts of schooling.

Using the PSID first as a series of cross sections, we computed the average hours of work in each year from 1967 through 1989 for prime-age workers (age 25 to 54). In this case, the sample individuals in each year vary as younger individuals enter the prime-age group and aging workers leave it. We limited our sample in each year to those who reported hours of work, eliminating from consideration those who were out of the labor force in a given year. Separate estimates were run by gender, race, and education. Figure 2, showing the trend in annual hours for all prime-age workers, gives clear evidence of variation related to the business cycle.

Average hours dipped sharply in 1970, in 1975, and then again during the steep 1981–1982 recession. But overwhelming the business cycle is a distinct U-shaped long-run trend in hours of work. When we compare 1979 and 1989 directly, the last two business cycle peaks, we find average annual hours increased by 79 over the decade.⁹ Over a longer period, this increase marked not so much a startling increase as a return to levels that prevailed in the late 1960s.

Figure 2 Average Annual Hours Worked, All Prime-Age Workers (Age 25–54)



Source: Authors' analysis of PSID data.

To obtain a more accurate estimate of the trend in hours (one that controls for the business cycle), we ran regressions where a time trend and the unemployment rate were regressed on annual hours of work for the entire 1967 to 1989 period. The results of the regression for all workers and for various subgroups are found in Table A1 in the appendix.¹⁰ After controlling for the business cycle, there is a small, statistically significant, overall upward trend in annual hours for prime-age workers as a group. The trend amounts to only 3.3 hours per year. Hence, over a 20-year period, we found a 66-hour increase in annual work—the equivalent of 1.5 FTE (full-time equivalent, based on a 40-hour week) weeks per year. This is well below Schor's estimate of 163 hours and a third below Mishel and Bernstein's estimate of 100. Nonetheless, the trend is decidedly upward in contrast to the essentially flat line Robinson and Bostrom find for the 1965 to 1985 period using the diary method.

Our method also detected sharp differences in work hour trends for men and women. Among men, the trend was found to be slightly negative after controlling for the business cycle. Over a 20-year period, the regression model projected a 53-hour decline in cycle-adjusted annual hours—just a bit steeper than the Robinson-Bostrom diary estimate of 36 hours (but clearly in the opposite direction from Schor’s positive trend estimate.)¹¹ For women, the trend is strongly positive. Indeed, our estimate of 18.8 additional hours per year translated into a 20-year total somewhat greater than even Schor’s estimate—9.4 FTE weeks vs. 7.5 FTE weeks. It should also be noted that working women’s hours were increasing at the same time that a higher proportion of the total paid workforce was made up of women.

We also found significant differences in the hours trajectories by race. Reflecting trends well-documented elsewhere, our point estimate of a decline of 7.7 hours per year for black men translated into an average workyear in the late 1980s more than 150 hours *shorter* than in the late 1960s. For 1989, we estimated that black men averaged only 1,950 hours per year compared with just under 2,300 hours for white men. Higher unemployment rates were responsible for part of this difference. Shorter workweeks explain the remainder.¹²

The racial gap in hours worked among women revealed an intriguing time pattern. On an annual basis, there appeared to have been virtually no gap in work hours in 1967. The gap then widened significantly so that by the mid 1970s black women were working almost 200 hours more per year than white women. White women caught up again so that by 1989 white and black women were working virtually the same amount. To close the gap, white women’s cycle-adjusted hours had to rise substantially faster than that of black women. This is precisely what happened, as the entries in Table A1 demonstrate. Over 20 years, white women’s annual hours increased by the equivalent of 10.3 FTE weeks, nearly double the 5.4 FTE weeks for black women.

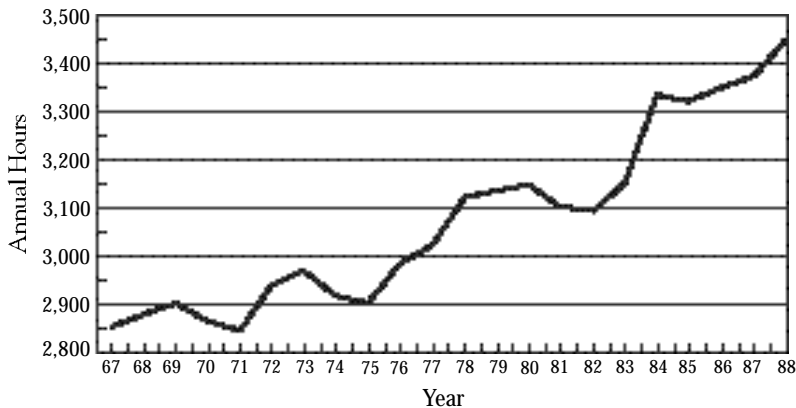
Our original work, therefore, confirmed an increase in hours worked by individual workers—not quite as large as either Schor’s or Mishel and Bernstein’s estimates, but large enough to constitute a sharp reversal of the previous long-term trend toward declining working time. This is the first evidence of a new labor supply regime.

Family Working Time and Earnings

Our investigation of working time did not end with looking at individual workers. We also investigated family work time and family earnings. We began by estimating the combined hours of work for “prime-age” families in which both husband and wife were working.¹³ The long-term trend is shown in Figure 3. There was, as expected, a clear and nearly unbroken trend toward much greater work effort, interrupted only modestly by the recessions of 1971, 1974–1975, and 1980–1982. By 1988 prime-age working couples were putting in an average of 3,450 hours per year in combined employment, up from 2,850 two decades before.¹⁴

These estimates were also subjected to regression analysis to eliminate business cycle effects. The results are found in Table A2 in the appendix. According to the regression, for all husband-wife working couples, family work effort increased by more than 32 hours per year each year during the 1970s and 1980s—the equivalent of adding nearly another month of full-time work effort every five years (160 hours). Hence, in the span of just two decades, working husband-wife couples increased their *annual* market work input by a cycle-adjusted 684 hours or *four months* of full-time work. Put still another way, the typical dual-earner couple at the end of the 1980s was spending an additional day and half on the job every week.

Figure 3 Average Annual Hours Worked, Prime-Age Families



Note: Limited to intact husband-wife families in which husband is prime age (25–54).

Source: Authors' analysis of PSID data.

Increases in family work effort were found to differ significantly by race and by education. The increase in working hours among white working couples was 60 percent larger than the increase for black couples—a reflection of both the sharp decline in black men’s hours and the large increase in white female work effort. More-educated working couples also increased their work effort more than those with less schooling. Those in which the husband had at least a four-year college degree increased their combined work effort by nearly 730 hours compared to an increase of only 490 hours for couples headed by a high school dropout.

How much did this enormous increase in work effort pay off in terms of increased family earnings? Are families working longer hours to improve their standard of living or simply to maintain it? The results for this inquiry are found in Table 2 in which growth in combined real earnings is compared to changes in combined work hours for the period 1973 to 1988.¹⁵

For prime-age working couples as a group, combined real earnings rose by 18.5 percent between 1973 and 1988 (an increase from \$43,851 to \$51,955 in 1991 dollars). These families therefore saw their material standard of living increase by just a little bit better than 1 percent per year. Most of this modest increase, however, did not come from improved wages, but from increased work effort. *The 18.5 percent increase*

Table 2 Percentage Growth in Annual Hours Worked vs. Percentage Change in Real Annual Earnings, Prime-Age Working Husband-Wife Couples, 1973–1988

	Combined Hours	Combined Real Earnings	“Family” Hourly Wage
All	16.3	18.5	1.8
White	17.1	19.8	2.2
Black	11.8	15.8	3.6
High school dropout	11.6	-8.2	-17.7
High school graduate	16.1	3.7	-10.7
Some college	17.4	3.8	-11.5
College graduate	16.6	32.5	13.6

Source: Authors’ calculations based on PSID data.

in real earnings was purchased with a 16.3 percent increase in hours worked. Over the entire 16-year period, the combined average husband-wife *hourly wage* increased by only 1.8 percent—the equivalent of a real hourly wage increase of less than 2 cents each year! The average working family with two earners appears to have been able to increase its consumption over time, but only by working much longer to enjoy what is basically a modest improvement in the amount of goods and services it can buy. The story is much the same for both white and black families; real earnings rise, but chiefly because of increased work effort.

However, when the data are disaggregated by education group, we find an even more telling story than that of workers sacrificing family time in order to indulge in a cornucopia of consumption. With the notable exception of families headed by a worker with at least a college degree, the enormous increase in work effort over the past 20 years has done no more than permit families on average to maintain their *old* standard of living. For families headed by a high school dropout, the situation has been especially tough. Between 1973 and 1988 these families increased their annual work effort by nearly 12 percent, yet they ended up with 8 percent *less* annual income. For families headed by a high school graduate or a worker with some college, work effort was up by 16.0 to 17.4 percent, but all these added hours left them with an increase in total earnings of less than 4 percent. These families are trapped in an Alice in Wonderland world, running faster and faster just to stay in the same place. For families of all levels of education except college graduates the “family” hourly wage has fallen precipitously, by as much as over 17 percent in the case of the high school dropout.

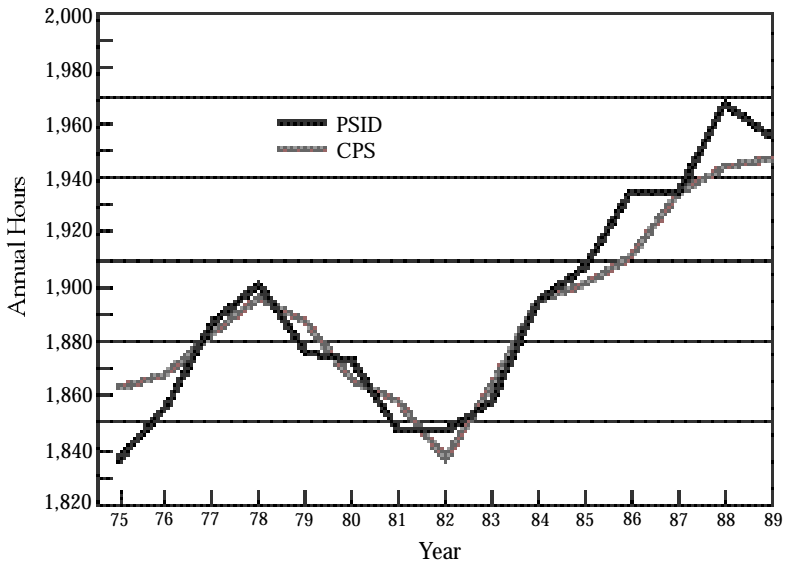
The one great exception to the Alice in Wonderland world is found in families headed by a college graduate. These families increased their work effort by about the same percentage as families headed by a high school graduate or a worker with some college, but their added work effort paid off, permitting their combined real earnings to increase by nearly a third between 1973 and 1988. In this one case, hard work apparently had its reward. Unfortunately, such well-educated families constitute less than a third of all families. For most other families, increasing their work time can be understood as a response to falling wage rates—evidence of behavior consistent with being on the backward-bending portion of the labor supply curve.

Trends in Work Time Since 1989

Our earlier work relied on PSID data that went only through 1989. To investigate the trend in hours worked since 1989, we turn to the Current Population Survey.¹⁶ The first task is to compare annual hours estimates from the two data sources we have been using. Although the CPS and the PSID ask different questions to ascertain work hours, we found such a close correspondence between the two data series that in this new work we feel confident in using the CPS, as well as the PSID, as the basis for estimating working time (see Figure 4).¹⁷ The correspondence is close enough that, in some cases, we have concatenated the two files in order to produce a full 1967 to 1995 data series.¹⁸

We focus our initial analysis on the prime-age workforce. Figure 5 reproduces Figure 2, adding the data from 1989 to 1995. It shows, as before, the trend—or, more accurately, the two trends—in annual work hours since the late 1960s. While there is a clear cyclical component in the data, the sharp decline in annual hours from 1967 through 1982 and the even sharper monotonic increase through the business cycle peak in 1989 are readily apparent (indicated by the superimposed slopes). What

Figure 4 Average Annual Hours Worked, All Prime-Age Workers (Age 25–54)



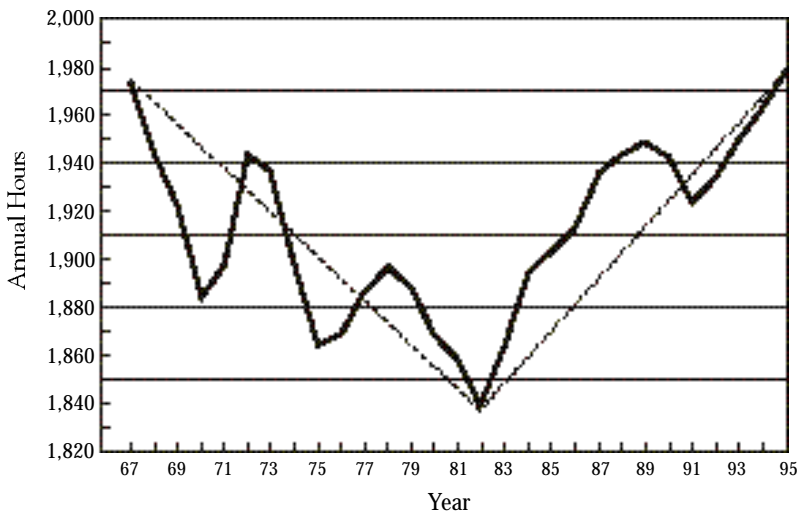
Source: Authors' analysis of CPS and PSID data.

we see on Figure 5 is that following a brief dip during the 1990–1991 recession, the growth in hours began to climb again. In 1995 average annual hours reached a new peak (1,979), surpassing its 1967 level. Since the last business cycle peak in 1989, annual hours have increased by another 32 hours—a 1.6 percent increase in labor supply from incumbent workers. The upward trend in working time shows no sign of easing.

Figures 6 and 7 depict the same data by gender. Considered together, the two figures indicate that from 1967 through 1982 the overall decline in annual hours was due to a collapse in men’s hours that could not be fully offset by increases in women’s hours. After 1982, however, even men’s hours began to increase, and they continued to do so right through the 1989 to 1995 period. Since 1989 the average workyear for men has increased by 18 hours (nearly half an FTE workweek), or 0.8 percent. Over the same period the average workyear for women has increased by 57 hours, or 3.3 percent. Note also the sharp cyclical recovery in men’s hours since the recession of 1991–1992.

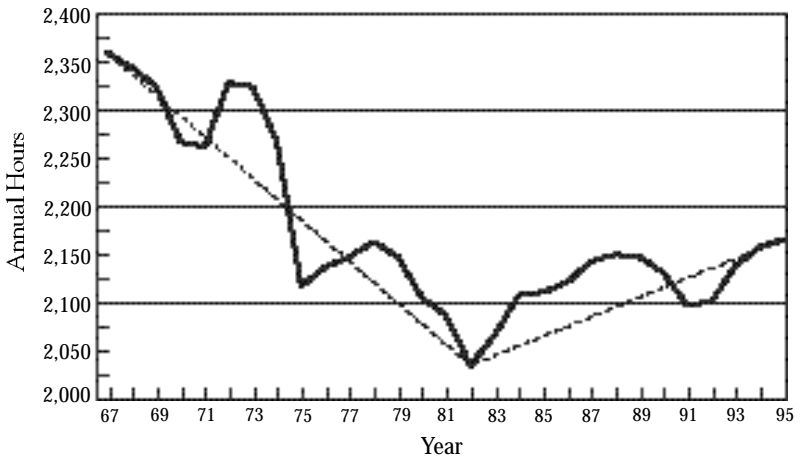
Changes in annual hours can be broken down into two components: changes in annual weeks worked and changes in average weekly hours worked. The former includes the effect of changes in the official unemployment rate, while the latter does not. As we have measured them here, weekly hours are estimated only for those who are already counted as

Figure 5 Average Annual Hours Worked, All Prime-Age Workers (Age 25–54)



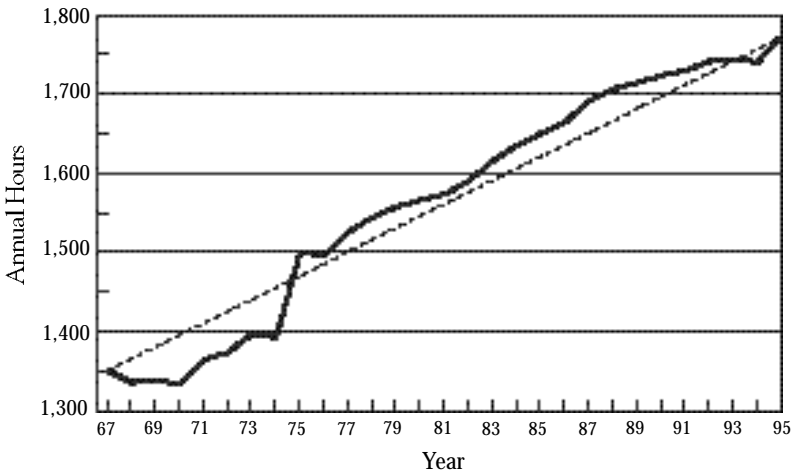
Source: For 1967 to 1974, authors’ analysis of PSID data; for 1975 to 1995, CPS data.

Figure 6 Average Annual Hours Worked, Male Prime-Age Workers (Age 25–54)



Source: 1967 to 1974, PSID; 1975 to 1995, CPS.

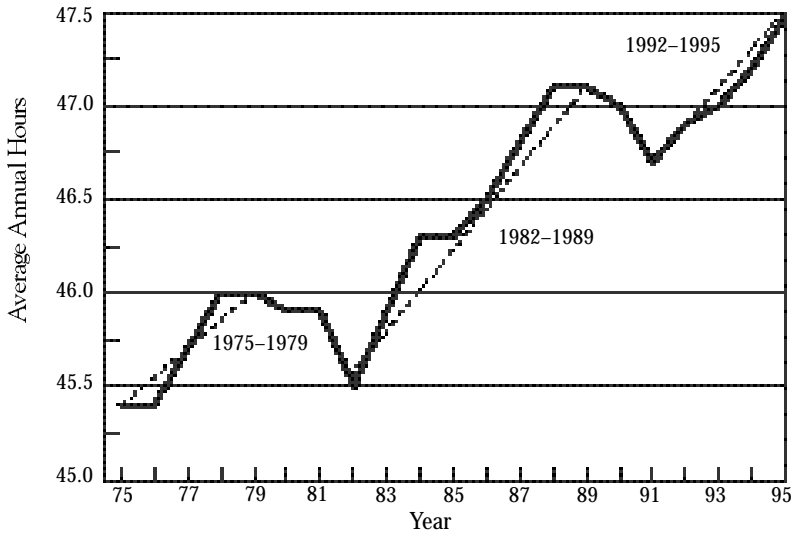
Figure 7 Average Annual Hours Worked, Female Prime-Age Workers (Age 25–54)



Source: 1967 to 1974, PSID; 1975 to 1995, CPS.

employed. Figure 8 shows the increase in average weeks worked. Note that in 1979, when the unemployment rate was 5.8 percent, prime-age workers averaged 46.0 weeks of work per year. In 1987, when the jobless rate was 6.2 percent, the average workyear was longer—about 46.8 weeks. Thus, by 1987 a portion of the overall labor supply “lost” to unemployment was being made up for by the increased time those who were working were contributing to the labor market.

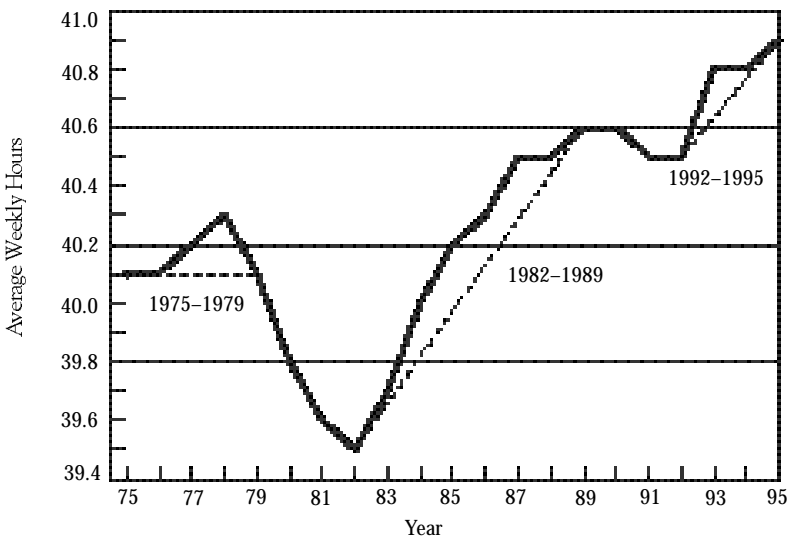
Figure 8 Average Annual Weeks Worked, All Prime-Age Workers (Age 25–54)



Source: 1967 to 1974, PSID; 1975 to 1995, CPS.

More important for unraveling the mystery of low unemployment and low inflation is what we have found regarding average weekly hours. Figure 9 shows the trend for prime-age workers since 1975. Of particular note are the remarkably different patterns following the recessions of 1975, 1981–1982, and 1991 (indicated by the superimposed slopes).

Figure 9 Average Weekly Hours Worked, All Prime-Age Workers (Age 25–54)



Source: Author's analysis of CPS data.

Average weekly hours rose between 1975 and 1978, but fell back to their 1975 level by 1979. Essentially, there was no added labor supply coming from incumbent prime-age workers during this strong economic recovery. In the last two recoveries, however, average weekly hours climbed dramatically. This is the clearest sign yet of a change in labor supply regime and, as we have suggested, helps to explain the Phillip's curves for the 1980s and 1990s that are flatter than the traditional curve for the recovery following the 1975 recession.

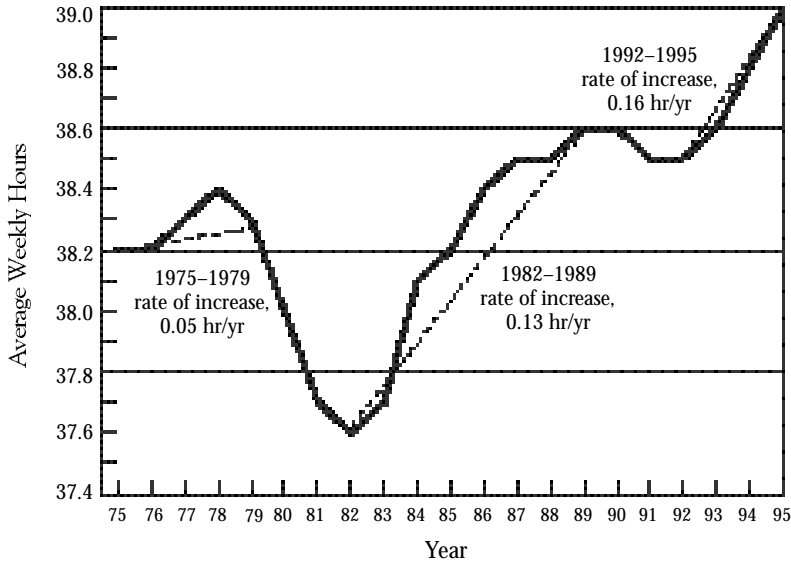
Increased Work Effort in the Total Workforce

To this point, we have focused on the prime-age workforce in order to compare recent trends with earlier ones. We used this age group to assure that estimates of changes in working time were independent of changes in the age composition of the workforce.¹⁹ For present purposes, however, we should measure work time trends among all workers, for this is the relevant variable for studies of the macro economy.

The results of our all-worker CPS analysis are found in Figures 10 through 14. Despite the fact that we are no longer holding the age profile constant, trends shown in these figures closely resemble the trends we found for prime-age workers. Figure 10 provides the 1975 to 1995 trend in weekly hours for all workers age 16 and older. Weekly hours expanded from a low of 37.6 in 1982 to a level in 1995 of close to 39.0. From a labor supply perspective, this is equivalent to increasing the number of workers in the economy by 3.7 percent. Given that the workforce was about 100 million strong in 1982, this increase in weekly hours is approximately equivalent to the addition of 3.7 million new workers to the total workforce or a reduction of the official unemployment rate by 3.7 percentage points. Between 1982 and 1995 the workforce as conventionally measured increased by 25.4 million. Hence, the increase in weekly hours among incumbent workers was equivalent to about 15 percent of the hours available from new workers. This is hardly a trivial amount, yet it is overlooked in measures of labor supply based on official unemployment rates.

The weekly hours trends for the past three recoveries can be seen in Figure 10. Note that in the 1975–1979 recovery, weekly hours increased by only 0.05 hours each year—the equivalent of just one-tenth of an

Figure 10 Average Weekly Hours Worked, All Workers (Age 16+)



Source: Authors' analysis of CPS data.

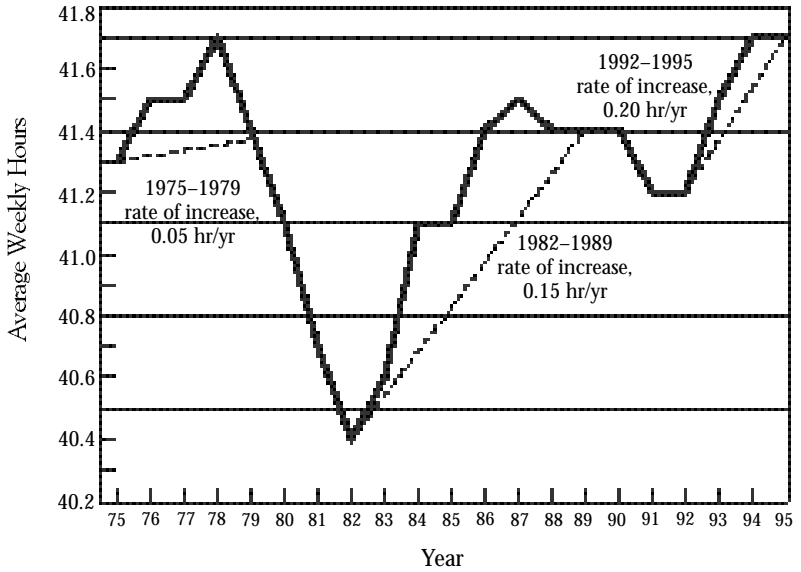
hour over one four-year period. In the 1982–1989 recovery the rate increased to 0.13 hours per year—the equivalent of a full hour per week of additional work. Finally, in the 1992–1995 recovery weekly work time rose by 0.16 hours per year. Again, the evidence is consistent with a labor supply regime change beginning in the 1980s and continuing to the present.

Figures 11 and 12 depict the weekly hours trends for men and women separately. The hours recovery for men since 1982 is particularly noteworthy. By 1995 the average workweek was back up to the peak level reached in 1979, 41.7 hours. Moreover, the rate of increase grew over the last three recoveries; in the 1992–1995 recovery, weekly hours increased by 0.20 hour per year, about four times the rate of the 1970s expansion.

For women, there has been a nearly continuous increase in weekly hours. Despite reports that women have reached a plateau in labor force participation and workforce attachment, the shift to longer working time seems to be as strong as ever. In 1975 women averaged 33.9 hours per week. During the 1975–1979 economic recovery they increased their weekly hours at a rate of 0.076 hours per year. At that pace by 1995 they would have been working 35.4 hours per week. In actuality, they were

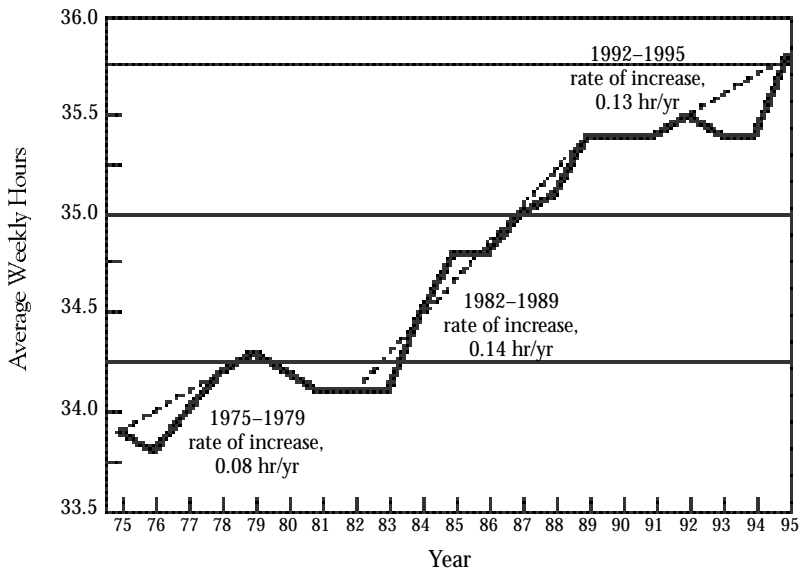
working even more—35.8 hours—indicating a slight accelerating shift from part-time to full-time work.

Figure 11 Average Weekly Hours, Men (Age 16+)



Source: Authors' analysis of CPS data.

Figure 12 Average Weekly Hours, Women (Age 16+)

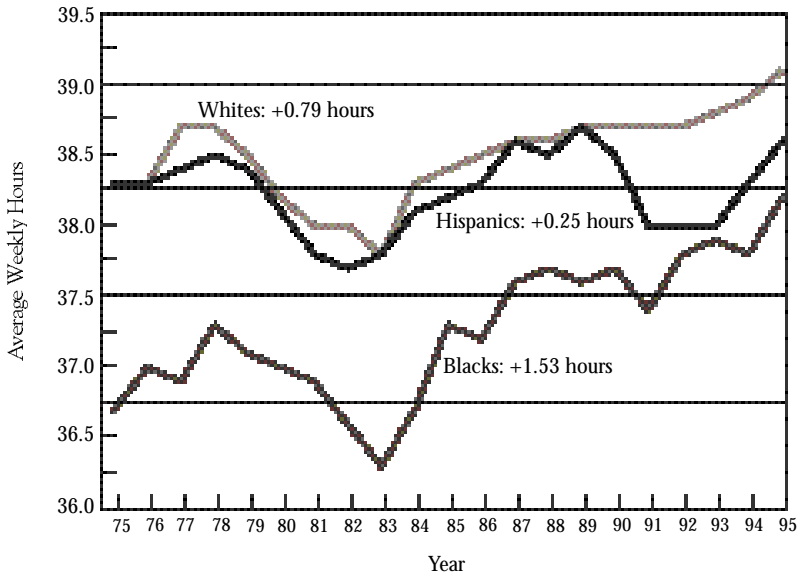


Source: Authors' analysis of CPS data.

There is a distinct racial and ethnic pattern to the weekly hours trend as well. As Figure 13 demonstrates, whites, blacks, and Hispanics have all seen increases in the length of their workweeks, but at different rates. Whites still work the longest workweek, but the gap between whites and blacks is closing—in contrast to the annual hours patterns for prime-age workers. In 1975 whites worked 1.6 hours more per week than blacks; by 1995 the gap had closed by nearly half to 0.86 hours. Hispanics had the slowest increase in weekly hours, having started out at the white level. They kept pace with whites throughout most of the period, but began to fall behind after 1989. This may reflect recent immigration patterns and, as we shall presently demonstrate, the role of education.

Figure 14 shows the trend in weekly hours by years of schooling. In general, the most educated workers, had the longest workweek. College-educated workers averaged 41.6 hours per week in 1995 compared to only 35.2 hours for high school dropouts. High school graduates and workers with one to three years of college fell near the middle of these two extremes. These results help explain the overall upward trend in weekly hours. As the labor force has become better educated, a larger proportion of the workforce falls into schooling categories that normally work longer hours. By 1995, 25 percent of the workforce had a college

Figure 13 Average Weekly Hours Worked, All Workers (Age 16+) by Race and Ethnicity

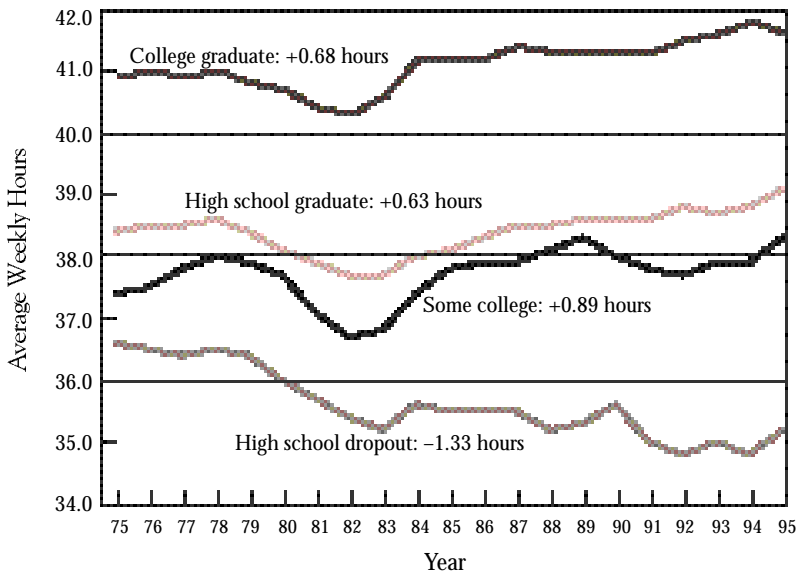


Source: Authors' analysis of CPS data.

degree. By contrast, in 1975 only 16.1 percent was this well educated. If the level of education had not increased over these 20 years, average work time would have increased by only about 9 minutes (from 38.16 to 38.31 hours) between 1975 and 1995.²⁰ The actual increase in work time was 48 minutes. Hence, more than 80 percent of the long-run increase in average weekly hours over the past 20 years can be associated with the increased education level of the workforce. Schooling contributes to faster economic growth not only by improving labor productivity, but also by adding to the overall level of labor supply, a factor overlooked in the NAIRU debate but partly responsible for the fact that NAIRU is now seen as time-varying and falling.

The contribution of increased education to increased weekly hours varies substantially across the last three business cycles. During the 1975–1979 recovery nearly 90 percent of the small total (7 minute) increase in the average workweek is associated with rising schooling levels. This leaves little of the increase to be explained by other factors, such as worker response to changing wage rates and worker expectations about job insecurity. In the two most recent recoveries, however, these other factors clearly dominate. Only 17.3 percent of the 65-minute total increase in weekly hours between 1982 and 1989 can be attributed to

Figure 14 Average Weekly Hours Worked, All Workers (Age 16+) by Education



Source: Authors' analysis of CPS data.

rising education levels. In the 1992–1995 recovery only 21.5 percent of the total 25-minute increase is associated with schooling. Thus, while over the long run, education plays a critical role in explaining increased labor supply, in the short run other factors are more important. Stagnating wages and increased job security are natural candidates.

Variation in Working Time and Job Insecurity

We have already seen how increased family hours were needed to keep annual earnings from falling. What do we know about the trend in job insecurity? If job instability is on the rise, it, too, could help explain the shift in labor supply permitting wage and price stability to be compatible with low unemployment rates. If workers are feeling more insecure, they may voluntarily work as much overtime as is offered by employers when work is available in order to cushion the blow of depressed income when joblessness strikes.

To examine job instability, we turn to the full longitudinal capacity of the PSID. We separate the PSID into two 10-year time frames, corresponding to the 1970s (1969–1979) and the 1980s (1979–1989). Both of these 10-year periods had similar growth rates in real output per person and in job creation and each encompasses two complete business cycles. This helps make for an appropriate comparison. We restrict our analysis to prime-age workers in order to exclude those who are likely to be moving from part-time to full-time work as they leave school and those who might be moving from full-time to part-time work as they approach retirement. The longitudinal nature of the data means that our analysis of each decade covers individuals who were 24 to 48 at the beginning of a 10-year time frame and were 34 to 58 at the end.

Employment Continuity

Our first task is to investigate continuity of employment—the ability to hold a full-time, full-year job consistently over 10 years. We define “strong” employment continuity as working at least 1,750 hours (50 weeks at 35 hours per week) in 8 out of 10 years and never working less than 1,000 hours in any single year. Using this definition, the results are clear. Job stability is declining. In the 1970s, 79 percent of prime-age

men met these criteria, but in the 1980s only 71 percent did so (see Table A3 in the appendix).

Individual demographic groups had varying degrees of employment continuity, but for every group except college graduates continuity declined between the 1970s and the 1980s. The decline for black prime-age men was the most precipitous, from 73 percent to 51 percent, indicating that nearly half of these men either had a year in which they worked less than half-time (less than 1,000 hours) or had at least 3 years out of 10 in which they worked the equivalent of part-time hours (less than 35 hours per week on average if they worked 50 weeks during the year). Persistent low earners (those with 10-year earnings histories that put them in the lowest earnings quintile) went from over one in two (52 percent) having strong continuity to under one in three (30 percent). Finally, the share of high school dropouts with strong continuity declined from 68 to 51 percent. These declines show the added difficulty faced by men at the lower end of the labor force distribution, a finding fully consistent with other studies showing a sharp deterioration in the labor market fortunes of less-educated men in general (Mishel and Bernstein 1994; Bluestone 1990a; Bluestone 1990b; Levy and Mumane 1992).

For women, the 10-year analytic approach accentuates their difference from men in terms of their labor force continuity. In the 1970s prime-age women averaged only 870 hours of paid labor per year. This level increased to 1,243 hours per year in the 1980s but still lagged considerably behind the male average of over 2,100 hours. In the 1970s only one in nine prime-age women (11 percent) met the criteria of strong labor market continuity (see Table A4 in the appendix). By the 1980s this ratio had risen to one in five (20 percent).

Another way of measuring the degree of labor force participation of prime-age workers is to define “weak” employment continuity as working full-time, full-year in three or fewer years and working less than 1,000 hours in each of five or more years during a decade. Only 2 percent of prime-age men in the 1970s had such little labor force activity and only 4 percent in the 1980s. For prime-age women, by contrast, nearly three out of five had this low level of labor market participation in the 1970s. In other words, by the definition we have adopted here, 59 percent of women would be considered part-time or part-year in the 1970s (Table A4). Only a decade later, this proportion had plummeted to 38 percent.

The important story here is that the overall supply of labor in the United States has increased sharply not only because the labor force participation rates of women are rising, but because many more of the women participating in the workforce are now working full-time. This critical shift in labor supply regime is missed in the standard measures of unemployment.²¹

Employment Connection

How secure individuals feel about their employment is largely tied to how likely they think it is that they will be laid off in the near future. To estimate the probability of maintaining employment with the same employer, we turn again to the Panel Study on Income Dynamics to determine what proportion of prime-age workers had a “strong” connection to their employers in the 1970s and 1980s. We confine this analysis to men. Defining “strong” connection as changing employers in no more than 1 year out of 10, 67 percent of men in the 1970s met this criterion. In the 1980s the percentage fell to only 52 percent (see Table A5 in the appendix). As for “weak” connection to employers—defined as having 4 or more years out of 10 in which a worker changed employers—we find a doubling of such weak connection from 12 percent in the 1970s to 24 percent in the 1980s. Clearly, job stability, as indicated by these measures, has declined precipitously for men.

It is possible that this large increase in instability is the result of workers’ quitting voluntarily to pursue better job prospects. Unfortunately, the government stopped compiling “quit” versus “layoff” statistics in the 1980s. Thus, we cannot say definitively that the decrease in strong connection or the increase in weak connection signifies increasing job *insecurity*. However, the widely reported restructuring of business in the 1980s suggests that a good deal of the instability is involuntary and therefore likely to lead to the feeling of insecurity.

Interyear Variance in Work Hours

If job instability affects working time, increased job insecurity could explain a number of labor market phenomena: increased voluntary overtime, increased moonlighting, and, ironically, higher rates of

underemployment. In brief, do workers face a “feast and famine” phenomenon in working time with the same Americans both overworked and underemployed? We explore this question by comparing the variation from year to year in hours worked in the 1980s with the variation in the 1970s.

Two methods of analysis are used to estimate the proportion of workers who experience a large variance in annual hours worked:

1. A *HiLo* analysis measures the proportion of individuals in a demographic group who during a decade experience a “HiLo” variation in annual hours worked. Workers have a HiLo experience if during the course of a decade they have at least one year in which they work more than 2,400 hours and at least one year in which they work 1,750 hours or less. The “Hi” value is equivalent to an average workweek of approximately 46 hours or more; the “Lo” value is equivalent to an average workweek of less than 35 hours. These cutoffs are arbitrary, but correspond to reasonable definitions of “overtime” and “part-time” work.
2. A CV_i analysis measures the coefficient of variation (s/\bar{x}) of annual hours worked for individuals in a demographic group during each decade.

An increase in these measures is evidence of the changing nature of labor supply. To the degree that these measures increase over time, we have added indication that insecurity is driving increased work time.

The results for the HiLo analysis for men are found in Table A6 in the appendix. Among all prime-age males, more than 28 percent experienced year-to-year variation in hours worked during the 1980s that meets the HiLo criteria of one year of substantial “overtime” (more than 46 hours per week) and at least one year of significant “under employment” (less than 35 hours per week). Compared to the 1970s, the proportion of individuals experiencing HiLo variance was up by nearly 5 percent.

For black men HiLo variance is substantially higher than for white men, with well more than a third of all black men experiencing this “feast and famine” type of working hours. While white men experienced less interyear variation in hours worked, over the two decades they moved closer to the black average. In the 1980s high school dropouts

experienced more hours variation than all other workers. By far the strongest correlates with the “feast and famine” work pattern are earnings levels and, not unexpectedly, number of job changes. Among those with average earnings in the lowest quintile, 4 out of 10 experienced HiLo hours variation in both decades; this correlation is a strong indication that this working pattern is not voluntary. Similarly, those who change employers often face the highest rates of HiLo activity. More than half of prime-age men who change employers at least four times in a decade end up with years of overtime and years of underemployment—a further indication of the involuntary nature of job instability.

Which groups showed substantial increase in hours variation between the two decades? According to Table A6, high school dropouts, college graduates, and those with earnings in the top and middle quintiles had the greatest rises in HiLo activity. From this, one might conjecture that those with the fewest skills and those in the ranks of middle management have been particular victims of downsizing, but future research with the PSID is needed to provide more evidence to test this hypothesis.

A HiLo analysis for women is driven by different factors. As we noted above, relatively few prime-age women work full-time, full-year consistently over 10 years. Even in the 1980s only 33 percent of prime-age women (versus 86 percent of men) averaged over 1,750 hours working per year. Therefore, few women are likely to meet the criterion of long hours in one year, although most are likely to have at least one year with under 1,750 hours worked. This is borne out in the HiLo data: 12 percent of women met the HiLo criteria in the 1970s and 21 percent in the 1980s. The differences among women by race and education were not large, but since women with higher 10-year earnings tended to work much longer hours than women with lower earnings, they obviously were much more likely to experience both some years of long hours and other years of short hours.

An alternative way to analyze the change in variation in hours over a 10-year period is to trace movements in the coefficient of variation (CV_1) for both men and women. As expected, the estimates for men are generally consistent with the HiLo estimates (see Table A7 in the appendix). For prime-age men as a group, there is a 9.1 percent increase in hours dispersion between the two decades, a slightly higher figure than the 4.6 percent increase in the HiLo estimate.

However, for specific subgroups, the CV_i estimates and the HiLo estimates do not yield the same rank orderings. For example, there is a much larger interdecade growth for HiLo variance for white men than for black men; the ordering is reversed for the CV_i . Similarly, the largest growth in CV_i hours dispersion is found in the lowest earnings quintile, so this group had not only the highest level of interyear variance, but the largest interdecade growth in dispersion.²²

Among women, the interyear variance in hours worked is anywhere from three to five times as great as for men. This reflects a statistical quirk in this measure; the tendency of women to move in and out of the labor force results in large variances around the mean. Thus among women with strong employment continuity (those in the top earnings quintile), the CV_i is not that different than men. Further, unlike men, the variance declines sharply between the 1970s and the 1980s. Again, this reflects the movement of women into the permanent full-time workforce—with fewer women spending years away from paid work. Given that women still have primary responsibility for children and household chores, this represents women's increased responsibility to work a “second shift,” contributing to the large increase in hours worked by two-earner couples.

Taken together, the analysis of strong and weak job connection and interyear variance in working time provides the strongest evidence yet of the changing the nature of labor supply. As job stability has declined, workers are doing everything they can to protect themselves from interruptions in their earnings. Working as much as they can when employment is available is one strategy that many workers and families have apparently adopted. Hence, as economic growth accelerates and jobs become available, workers expand their hours of work to meet the demand. Simply put, there is a good deal more supply out there than current labor market statistics imply.

Conclusions and Policy Implications

We have traced changes in men's, women's, and family working time since the late 1960s and considered how these changes have affected overall labor supply. The key point we have made is that conventional measures of labor force participation and unemployment, which simply

count whether individuals are in the labor force and employed one hour or more in a given week, are providing an increasingly inaccurate and misleading gauge of available labor supply because they ignore the fact that, with stagnating wages and increased job insecurity, incumbent workers have increased their working time dramatically, adding substantially to the total hours of labor that employers can draw upon. As a result, falling unemployment rates do not necessarily mean that we are “running out of workers” and consequently face imminent wage-price push inflation. Rather, we have an increasing labor supply that keeps a lid on inflation and provides the human resources that can sustain faster economic growth rates.

Tracing working time back to the late 1960s reveals a critical labor supply regime shift that occurred after the 1980–1982 recession. Between 1967 and 1982 average annual work hours declined significantly, by about 135 hours per year per worker. After 1982 this trend reversed and average hours began to increase. The upward trend since 1982 has been nearly monotonic, with the exception of a slight dip during the 1990–1991 recession. By 1995 annual hours of work were back to their 1967 level. This increase in annual hours since 1982 is composed of both an increase in weeks worked per worker and an increase in hours worked per week.

While there may be many factors that can explain the labor supply regime shift, two seem to be of special importance: stagnation in average wages and the growing feeling of job insecurity among workers in an era of industrial restructuring, downsizing, and mass layoffs. Stagnating wages increase the need for families to work more hours to maintain living standards; job insecurity motivates workers to work as many hours as possible when jobs are available in anticipation of a time when they may not be. Both factors lead to increasing individual work time, essentially, a source of labor supply available to meet increases in labor demand.

The macroeconomic consequences of this shift in labor supply regime are striking. Before the shift falling unemployment rates appeared to lead to wage-price pressures and higher inflation, as we saw during the late 1970s. But since the shift the trade-off between unemployment and inflation has become much more benign. By the 1990s the unemployment rate could fall to less than 5 percent without any hint of inflation. Instead of widespread bottlenecks due to labor shortages, incumbent workers have provided enough additional labor supply to fill the needs

of most employers, keeping any potential wage-led inflation under control.

These findings have a number of important policy implications relating to such diverse concerns as promoting better labor market statistics, reconsidering the potential for welfare recipients to find jobs in what is described as a “tight” labor market, and cautioning the Federal Reserve Board against relying on official unemployment rates in the setting of monetary policy.

Labor Market Statistics

A natural concern is to have timely and accurate data to reflect the new reality associated with the labor supply regime shift. This will require paying more attention to a gamut of statistics, some of which are available but not published regularly and others that would need to be collected. The Current Population Survey, fielded each month by the Bureau of Labor Statistics and the Census Bureau, is the primary source of data on labor force participation and unemployment. Once a year, in March, additional questions are added to the CPS, forming what is known as the Annual Demographic File (ADF). This expanded survey provides information on such matters as annual income and weeks worked last year. Indeed, we used these data to compute many of the charts in this policy brief.

Despite the wealth of information in the monthly CPS and the ADF, the Bureau of Labor Statistics normally presents hours of work based on employer surveys rather than on these household surveys. As a result, the monthly labor report often provides a mistaken view regarding working time. The number of hours worked *per job* can be going down based on the employer survey, while the number of hours worked *per worker* can be going up according to the household survey. Multiple-job and self-employment hours are not reported in the employer surveys. Thus, if an incumbent worker takes a second job and works 10 hours a week at it, the average workweek reported in the employer surveys will actually go down as the result of the added part-time job. On the other hand, based on the CPS household survey, neither the number of workers in the labor force nor the official unemployment rate will change, but total hours of labor supply will increase. Since the monthly BLS report stresses labor force participation, unemployment, and hours worked (per job),

the overall impression will be one of a tighter labor market despite the increase in real labor supply.

This immediate problem could be solved by having the BLS calculate the average workweek from the CPS and report this along with the employer survey working time data. But there is a bigger issue here. It has to do with the change in the structure of work. With more people working under part-time or part-year contingent contracts, with some increase in moonlighting, and with substantial increases in overtime (at least in manufacturing), the movement toward “nonstandard” workweeks and workyears is growing. Yet the standard statistics hardly measure this.

To remedy this problem, the CPS should be modestly expanded to collect more complete information on a monthly basis on second (and third) jobs, types of employment structure, and self-employment. These data could be used to produce more accurate measures of true labor supply including changes in hours worked by incumbent workers. Questions like those in the Panel Study of Income Dynamics, which probe about hours of work on multiple jobs, might provide a template for such CPS questions. Asking about the last two years rather than just one might shed some new light on labor market dynamics. The interviewer could inquire, Have you experienced reduced hours over the past month, year, or two years, and if so, why? Have you suffered a reduction in your rate of pay? Has another member of your family had reduced hours or a reduction in pay? A few questions could explore what workers think is going to happen in the next six months; for example, Do you foresee a reduction in earnings or hours? In addition to adding questions to the CPS and the ADE, undertaking longitudinal surveys could help, since these can track the actual labor market participation of individuals over the business cycle and as they age.

We also should consider going back to collecting employer data on layoffs and quits, which was commonplace until the 1980s, but was discontinued by the Reagan administration. Without this information we do not have a good idea how many employment separations are due to the voluntary action of the employee or to an involuntary layoff by the employer. These data would give us better information on which to judge job stability and job security.

Welfare Mothers and Work

Proponents of welfare-to-work initiatives are optimistic that the current strong economic conditions are a propitious moment for welfare mothers to find jobs. Given that the economy is adding almost 2 million net new jobs a year, they believe there are enough opportunities for even those with the least skill and experience. While many opponents of these plans have criticized their cost effectiveness (because of the expanded need for child care and training), we feel that the plans may have a more basic flaw—optimism about the prospects for welfare mothers may be misplaced. Based on the research reported here, we do not think that one can conclude from recent job growth and unemployment rates below 5 percent that labor markets are so tight that new, unskilled entrants can easily find employment.

Welfare mothers have never been a monolithic group and most are on assistance for only a short period of time. Some have the requisite skills to find jobs easily, especially when overall unemployment is as low as it has recently been. But Educational Testing Service studies of welfare recipients show that many have quite low proficiencies in core skills.²³ Therefore, their success in obtaining employment is very much dependent on employers' being so pressed that they are willing to take chances they ordinarily would not. Our view of the current labor markets is that they are not as tight as many believe and employers will seek more work from their experienced workers before resorting to new hires, especially those with limited skills. Legislatures will have to revisit assistance programs in the near future as fewer than expected former recipients are able to support themselves.

Macro Policy

Finally, and perhaps most importantly, is the implication of our research for macro policy in general and monetary policy in particular. Because official measures of unemployment can no longer be trusted as indicators of overall labor market conditions, it would be prudent for the Federal Reserve to pay little attention to them when it comes to setting short-term interest rates or manipulating the money supply. To his credit, Fed chairman Alan Greenspan seems to agree. Few economists have as broad

and deep a knowledge of economic statistics, or are as skeptical of their value, as he. Accordingly, Greenspan has prevailed upon his colleagues to keep interest rates unchanged even as the unemployment rate has fallen well below a level once thought certain to be inflationary. His understanding of how the rise in job insecurity and stagnating wages affects labor supply is well worth heeding, as the analysis in this policy brief suggests.

Will the current climate of job insecurity, job instability, and stagnating wages soon change? Are we on the verge, given low unemployment rates, of returning to the old labor market regime of declining average workweeks and annual hours of work? We do not think so. The underlying phenomena of global competition, technological change, weakened unions, and industry deregulation give no sign of dissipating. As such, at current sustainable economic growth rates, over the foreseeable future one can expect a continued upward trend in hours, which will provide the needed labor supply to keep inflation under control. These institutional phenomena will therefore accomplish much of what the Fed might have done in the past to keep price increases in check. Indeed, the Fed might even be able to relax short-term interest rates a bit in a bid to increase growth rates without endangering price stability.

There are, to be sure, often enormous personal, family, and community costs as a result of the trend toward “overwork” in America. But, as we have seen here, there is one substantial benefit—price stability at low unemployment rates. If we can now reward hardworking Americans with faster growth and the prospect of rising wage rates, the longer workweeks will not have been totally in vain.

Appendix

Table A1 Estimates of the Time Trend in Annual Hours Worked, Prime-Age Workers, 1967–1989

	Time Trend ^a	Unemployment Rate	Constant	Adjusted R ²	N
All	3.3 (3.79)	-20.7 (6.37)	1773.0	.659	22
Men	-2.6 (2.97)	-23.7 (7.15)	2599.9	.808	22
Women	18.8 (15.50)	-8.7 (2.35)	55.3	.919	22
White men	-2.1 (2.23)	-23.3 (6.62)	2574.4	.773	22
Black men	-7.7 (5.55)	-33.0 (5.80)	2860.0	.863	22
White women	20.5 (15.31)	-9.7 (2.44)	-86.8	.917	22
Black women	10.7 (4.18)	-2.3 (0.79)	733.2	.435	22

^aChange per year in hours worked.

Note: Cochran-Orcutt transformed regression estimates; *t*-statistics in parentheses.

Source: Authors' calculations based on PSID data.

Table A2 Estimates of the Time Trend in Annual Hours Worked, Prime-Age Husband-Wife Couples, 1967–1988

	Time Trend ^a	Unemployment Rate	Constant	Adjusted R ²	N
All	34.2 (24.24)	-36.9 (7.10)	652.7	.969	21
White	35.1 (25.3)	-37.2 (7.26)	591.7	.972	21
Black	22.8 (9.80)	-31.8 (3.68)	1450.9	.831	21
High school dropout	24.5 (7.25)	-49.4 (4.12)	1317.5	.718	21
High school graduate	33.0 (15.41)	-48.4 (6.16)	826.4	.924	21
Some college	32.6 (7.69)	-44.5 (4.36)	924.8	.766	21
College graduate	36.4 (19.75)	-10.2 (1.61)	365.6	.958	21

^aChange per year in hours worked.

Note: Cochran-Orcutt transformed regression estimates; *t*-statistics in parentheses.

Source: Authors' calculations based on PSID data.

Table A3 “Strong” Employment Continuity in the 1970s and 1980s, Men (percent)

	1970s	1980s
All	79	71
Race		
White	79	71
Black	73	51
Education		
High school dropout	68	51
High school graduate	84	72
Some college	87	70
College graduate	77	79
10-year earnings quintile		
Lowest	52	30
Fourth	76	66
Middle	82	75
Second	90	87
Top	94	91

Source: Stephen J. Rose, “On Shaky Ground: Rising Fears about Incomes and Earnings,” Research Report no. 94-02 (Washington, D.C.: National Commission for Employment Policy, 1994).

Table A4 “Strong” and “Weak” Employment Continuity in the 1970s and 1980s, Women (percent)

	Strong		Weak	
	1970s	1980s	1970s	1980s
All	11	20	59	38
Race				
White	10	20	61	39
Black	13	22	48	33
Education				
High school dropout	8	13	65	56
High school graduate	12	22	60	38
Some college	15	25	56	35
College graduate	8	19	48	29
Marital status				
Never married	29	35	33	20
Sometimes married	13	24	45	26
Always married	8	15	67	48

Source: Stephen J. Rose, “On Shaky Ground: Rising Fears About Incomes and Earnings,” Report no. 94-02 (Washington, D.C.: National Commission for Employment Policy, 1994).

Table A5 Connection to Same Employer in the 1970s and the 1980s, Men (percent)

	Weak		Medium		Strong	
	1970s	1980s	1970s	1980s	1970s	1980s
All	12	24	21	24	67	52
Race						
White	12	23	21	25	67	52
Black	13	34	22	17	65	49
Education						
High school dropout	14	39	23	20	63	41
High school graduate	10	20	21	21	68	60
Some college	12	25	21	28	67	47
College graduate	11	18	19	26	70	56

Note: "Strong" connection, having no more than 1 year out of 10 in which worker changed employers; "medium" connection, having 2 to 3 years out of 10 in which worker changed employers; "weak" connection, having 4 or more years out of 10 in which worker changed employers.

Source: Stephen J. Rose, "Declining Job Security and the Professionalization of Opportunity," Research Report no. 95-04 (Washington, D.C.: National Commission for Employment Policy, 1995).

Table A6 HiLo Analysis of Hours Variance for Individual Workers, Men

	Percent with HiLo Variance ^a		Percent Difference
	1970s	1980s	
All	27.3	28.5	4.6
Race			
White	26.2	27.9	6.4
Black	38.6	37.2	-3.4
Education			
High school dropout	30.5	38.2	25.2
High school graduate	26.0	24.7	-4.9
Some college	31.3	28.6	-8.6
College graduate	22.2	26.6	19.5
10-year earnings quintile			
Lowest	40.6	39.2	-3.5
Fourth	40.0	37.3	-6.0
Middle	23.5	28.6	21.5
Second	21.8	21.3	-2.4
Top	10.3	16.3	58.0
Number of years in which changed employer			
0-1	18.2	15.5	-15.2
2-3	35.9	33.6	-6.4
4+	56.1	50.8	-9.4

^aAt least one year > 2,400 hours and at least one year < 1,750 hours.

Source: Authors' calculations based on PSID data.

Table A7 CV_i Analysis of Hours Variance for Individual Workers, by Gender

	Men			Women		
	CV_i		Percent Change	CV_i		Percent Change
	1970s	1980s		1970s	1980s	
All	.22	.24	9.1	1.02	.67	-34.3
Race						
White	.22	.23	4.5	1.05	.68	-35.2
Black	.28	.36	28.6	.90	.60	-33.3
Education						
High school dropout	.30	.34	13.3	1.14	.96	-15.8
High school graduate	.21	.24	14.3	1.04	.67	-35.6
Some college	.18	.25	38.9	.98	.56	-42.9
College graduate	.17	.17	0.0	.79	.56	-29.1
10-year earnings quintile						
Lowest	.45	.54	20.0	2.29	1.72	-24.9
Fourth	.21	.20	-4.8	1.39	.78	-43.9
Middle	.17	.17	0.0	.79	.43	-45.6
Second	.15	.14	-6.7	.41	.25	-39.0
Top	.13	.14	7.7	.24	.18	-0.25

Source: Authors' calculations based on PSID data.

Notes

1. For example, in the year ending in May 1997, producer prices for heavy trucks were down 4.5 percent, for glass containers down 2.9 percent, and for photographic equipment down 2.3 percent; major consumer goods from household appliances to toys and cosmetics saw consumer price declines ranging from 1.0 to 2.2 percent (Mandel 1997a).
2. One might also note that the recent decline in the rate of health care inflation has itself had an ancillary impact on overall prices by reducing the rate at which the cost of employee benefits has been rising throughout the economy. After increasing in real terms by better than 2 percent a year earlier in the decade, average benefit costs actually declined in 1995 and again in 1996, reining in overall employment cost increases despite tighter labor markets (Bernstein 1996).
3. Soon after the jobless rate first slipped below 6.0 percent in 1994, the Fed raised short-term interest rates a quarter point and followed this up with five more rate hikes in quick succession, deliberately trying to slow the economy. The Fed action "worked." Although inflation never did appear as a problem, the higher interest rates slowed the GDP growth rate from 3.5 percent in 1994 to just 2.0 percent in 1995. More recently, in March of 1997, the Fed raised the federal funds rate (the interest rate member banks charge for overnight loans) soon after the BLS announced that the unemployment rate had fallen to 5.2 percent. And, again, in April 1997, only days after the BLS announced that the unemployment rate had fallen under 5.0 percent, Alan Greenspan was publicly warning of labor markets that seemed to have become too tight for the good of the economy. Speaking at New York University, he noted, "While there is scant evidence of any imminent resurgence of inflation at the moment, there also appears to be little slack in our capacity to produce" (quoted in Schlesinger, 1997). That the Fed was considering raising interest rates again purposefully to slow the economy was clear from his remarks. Presumably, Greenspan was judging that at such low unemployment rates, feelings of job insecurity surely had to be evaporating.
4. This analysis was carried out by decomposing the changes in total hours of work according to the following formulas.

Added hours to changes in population growth:

$$\text{POP}_{(t-(t-1))} \times \text{LFPR}_{t-1} \times (1 - \text{UR}_{t-1}) \times (\text{hrs/worker})_{t-1}$$

Added hours due to changes in the labor force participation rate:

$$\text{LFPR}_{(t-(t-1))} \times \text{POP}_{t-1} \times (1 - \text{UR}_{t-1}) \times (\text{hrs/worker})_{t-1}$$

Added hours due to changes in the unemployment rate:

$$(1 - \text{UR})_{(t-(t-1))} \times \text{POP}_{t-1} \times \text{LFPR}_{t-1} \times (\text{hrs/worker})_{t-1}$$

Added hours due to changes in hours worked per worker:
 $(\text{hrs/worker})_{(t-(t-1))} \times \text{POP}_{t-1} \times \text{LFPR}_{t-1} \times (1 - \text{UR}_{t-1})$

where: POP = civilian noninstitutional population

LFPR = labor force participation rate

UR = unemployment rate

hrs/worker = average annual hours worked per worker

5. The textbook example is the worker who wins millions of dollars in a state lottery. His or her wage remains unchanged, but income rises significantly. Often, such a prizewinner will choose to cut back on work hours, at least temporarily.

6. According to a recent survey by *The Economist*, Americans have now surpassed even the Japanese in annual work time and toil 15 percent longer than the typical German. See "Workaholics Anonymous: Why Do Americans Work So Hard?" *The Economist*, October 22, 1994, p. 20.
7. An analysis of Current Population Survey data by the Economic Policy Institute and the Women's Research and Education Institute indicates that in 1995 there were over 34 million part-time, temporary, and contract workers in the United States—29.4 percent of the total workforce (Spalter-Roth et al. 1997). Of these, 16 million workers (14 percent of the labor force) were part-timers, working 35 hours or less per week. Smaller in absolute numbers, but growing much faster, is the temporary workforce, which between 1982 and 1996 more than quadrupled to 2 million workers. The number of contract and self-employed workers is also growing rapidly. In a report completed in 1991 on data for 1985 through 1988, the U.S. General Accounting Office reported that the number of individuals who were self-employed or working under personal contract was growing at over 13 percent a year (as measured by IRS Form 1099 submissions) (U.S. General Accounting Office 1991). In 1995, 13 million Americans worked for themselves either full-time or as a supplement to regular or part-time employment.
8. Similar time diary studies were carried out in the mid 1960s in a number of other countries (Szalai et al. 1972).
9. This result is almost identical to the 1979 to 1989 increase reported by Mishel and Bernstein (1994, Table 3.1, 112). Using the CPS, they find an 82-hour increase in annual hours compared to our 79.
10. Because of autocorrelation, these regressions were run using the Cochran-Orcutt transformation. OLS regressions for the groups reported in Table 2 generated Durbin-Watson statistics that ranged from .89 (white female regression) to 1.62 (black male regression).
11. Robinson-Bostrom's diary estimates for men for 1965 and 1985 are 47.1 and 46.4 weekly hours, respectively. Multiplying the difference between these two estimates by 52 yields 36.4 annual hours.
12. In 1989 the average white unemployment rate was 4.5 percent and the black rate was 11.4 percent. On average, then, whites experienced $(52 \times 0.045 \times 40) = 93.6$ hours a year of lost work due to unemployment. By the same calculation, blacks experienced 237 hours of lost work. The difference (143.4 hours) accounts for just 41 percent (143/350) of the difference in annual hours between white and black men. The remainder, approximately 210 hours, must be due to shorter workweeks, with black men working roughly 4 hours per week less than white men after accounting for differences in unemployment.
13. This analysis is limited to intact husband-wife families in which the husband is "prime age" (age 25–54) and in which both husband and wife worked at least one hour in the survey year.
14. Because of incomplete family hours and earnings data for 1989 in the PSID we used for conducting this study, the following analysis is done for the period ending in 1988.
15. The year 1973 was chosen as the base year for this analysis because that year represents the end of the postwar boom in real average hourly wages.

16. This was necessary because our version of the PSID contains data only through 1989.
17. It should be noted that total hours worked is derived differently in the CPS and in the PSID. In the CPS total hours equals usual weekly hours multiplied by the number of weeks worked, with paid vacations and sick time included as working weeks. By contrast, the PSID tracks actual hours worked excluding time off for vacations and illness. Thus, the PSID annual hours worked variable is computed by adding usual hours worked per week times actual weeks worked plus overtime hours plus working time on second and third jobs. It seems that the hours lost in the PSID by not counting vacation and sick time as part of working time are almost exactly offset by the added hours due to overtime and moonlighting.
18. In these concatenated analyses, hours estimates for 1967 to 1974 are from the PSID and those from 1975 through 1995 are from the CPS.
19. Age composition affects estimates of average working time because of the reduced hours put in by both younger workers and older workers. Younger workers are more likely to mix work with school and therefore a larger proportion will be working part-time hours. As workers approach retirement years, they are likely to cut back hours, also affecting overall hours estimates. Therefore, as the age profile of the working population changes, there will naturally be a change in hours worked unrelated to changes in labor supply regime. By measuring the labor supply of prime-age workers, we held the demographic profile fixed over the time series we investigated.
20. This value was calculated by weighting the 1995 weekly hours for each education group by the 1975 share of the workforce in each of these education groups. The difference between the actual 1995 weekly hours estimate and this 1975 education-weighted 1995 weekly hours estimate was then divided by the actual weekly hours increase between 1975 and 1995. This yields the percentage associated with increased education level (80.8 percent).
21. One might also note that Table A7 indicates the racial difference among prime-age women in labor force continuity is the reverse of that for men. In both the 1970s and the 1980s black women have both higher levels of strong continuity and lower levels of weak continuity to the labor market—although both gaps are closing. In general, more-educated women have stronger continuity as expected, with the one anomaly being the drop off in continuity among college-educated women. At this point, we do not have a good explanation for this finding. It is possible that this may reflect a contingent of better-educated women who have gone back to school during their “prime working years” to complete additional education. Another possibility is that this reflects delayed childbearing among college-educated women and therefore more part-time employment in the early prime working years.
22. This particular result suggests why the two measures of dispersion can yield different outcomes. It is possible that workers in the lowest earnings quintile could have a low proportion of HiLo variance because few of them ever worked more than 2,400 hours. However, if variance below 2,400 hours were to increase, the coefficient of variation could be substantial and trend upward.
23. See Barton and Jenkins (1995); see also Carnevale and Desrochers (1998).

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