Institute for Research on Poverty
Discussion Paper no. 1059-95

The Utilization of U.S. Male Labor, 1975–1992: Estimates of Forgone Work Hours

Lawrence Buron
Abt Associates
Bethesda, Maryland

Robert Haveman
Department of Economics
University of Wisconsin–Madison

Owen O'Donnell
Department of Economics
University of Kent

March 1995

The major part of this research was undertaken while Larry Buron was a graduate student and Owen O'Donnell was a Visiting Assistant Professor at the University of Wisconsin–Madison. The support of the Jerome Levy Institute of Bard College (N.Y.) is gratefully acknowledged. This project was also supported by a grant to the Institute for Research on Poverty by the Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation. The Unicon Research Corporation kindly supplied the CPS data in a convenient CD-ROM form.

Abstract

The percentage of working-age men in the United States who were fully active in the labor market decreased over the 1975–1992 period ("fully active" means working 2080 hours in a year). Similarly, the extent to which men were less than fully active increased. When one considers the number of hours by which men fell short of the 2080 norm in 1992, it was as if 20 percent of them did not work at all in that year, up from 18 percent in 1975. However, because the least-productive workers were the ones most likely to be less than fully active and the most-productive were the ones least likely to be less than fully active, total productivity-weighted work hours did not fall by this large an amount. If men failed to work 2080 hours in a year, most likely it was because they did not work at all; men most often did not work at all because they could find no jobs. Data were from Current Population Surveys.

The Utilization of U.S. Male Labor, 1975–1992:
Estimates of Forgone Work Hours

1. INTRODUCTION

The past three decades have witnessed a general decline in the labor market activity of U.S. working-age males. Trends in jobless rates, nonparticipation rates, unemployment rates, and part-time work all show that a falling proportion of males are fully active in the labor market (Buron, Haveman, and O'Donnell, 1994). Inactivity is particularly pervasive among nonwhites, both younger and older males, and those with the lowest levels of education (Buron et al., ibid.). Increases in inactivity are concentrated among these same groups.

This paper documents the drop in the utilization of male labor over the 1975–1992 period and examines potential causes of it. We propose two new indicators of labor underutilization—forgone hours and weighted forgone hours—and use them to examine the patterns of labor market activity of working-age males over the 1975–1992 period. An individual is considered fully active if he works the equivalent of full-time for the full year (FTFY); the latter is defined as working 52 weeks at 40 hours per week (2080 hours). The "activity deficit" is measured by FTFY hours less the hours an individual actually works; this is referred to as **forgone hours**. When forgone hours are weighted by the predicted hourly wage of each individual, we obtain **weighted forgone hours**, which yields a second indicator of the activity deficit. Weighted forgone hours provides an indicator of the economic production forgone because of the underutilization of labor. We use both indicators as measures of the difference between the actual and potential utilization of labor resources.

We discuss four indicators of labor utilization, each of which rests upon the concept of forgone hours. They are:

- **Percent with positive forgone hours (percent PFH).**

  This indicator records the share of the working-age male population failing to meet the 2080 hours per year norm we have chosen to define full utilization; we refer to this indicator as percent PFH.

- **Mean forgone hours among those with positive forgone hours (MFH/P).**

  This is a measure of the extent of labor underutilization among those failing to meet the 2080 norm, and is expressed as a percentage of the 2080 norm; we refer to it as MFH/P, indicating the measurement of mean forgone hours (MFH) among those with PFH.

- **Mean forgone hours for the entire male population (MFH).**

  This summary indicator divides the total number of forgone hours in the population by the total number of males, and is also expressed as a percentage of the 2080 norm; we refer to it as simply MFH.[1]

- **Mean weighted forgone hours for the entire male population (MWFH)**

  This measure is the total number of (productivity) weighted forgone hours divided by the total number of males. We refer to this indicator as MWFH.

Increasing underutilization of male labor may result from individual choices in an increasingly wealthy society to enjoy more time in leisure activities, or it may be due to declining opportunities for attachment to the labor market. In this paper, examination is made of the causes of labor underutilization through attribution of forgone hours and weighted forgone hours to reasons given by individuals for being less than fully active.

In Section 2, we examine the distributions of annual hours worked by males aged 18–64 over the 1975–1992 period.[2] Here, and throughout the paper, the data used are from the 1976–1993 Current Population Surveys (CPS). The March CPS gathers information on labor market participation

and earnings, for the preceding year. The sample consists of noninstitutionalized civilian males who were not in the military or school in the previous year and who are not currently students.[3,4] Military personnel and students are excluded in order to focus on the pattern of labor utilization among those who are expected to be active in the labor market.[5] Examination of the distribution of annual hours worked provides justification for the choice of 2080 hours as the baseline for our definition of forgone hours.

Section 3 presents trends in the proportion of the population which has positive forgone hours (percent PFH). This section also shows mean forgone hours—MFH/P and MFH—indicating the extent of labor underutilization. Disaggregations by race, age, and education are also presented. Section 4 poses the question of why the utilization of male labor has decreased over the past eighteen years. The possibility that this is merely an artifact of a change in the demographic composition of the population is considered and dismissed. Demographic standardization reveals that the decline in activity would have been even greater if the structure of the population had remained constant; the question of why inactivity has increased remains.

In Section 5, forgone hours are attributed to the reasons given by CPS respondents for being less than fully employed. This allows, for example, comparison of the relative contribution made by early retirement and a lack of employment opportunities. Distinction is made between voluntary and involuntary reasons for the underutilization of labor and the contribution of each over time is examined.

Section 6 summarizes our results using the mean weighted forgone hours indicator of labor underutilization, MWFH. We present estimates of MWFH for the entire male working-age population, as well as separate estimates for race, age, and education subgroups. The final section summarizes the findings and discusses a number of the issues generated.

2. ANNUAL HOURS WORKED

Mean hours worked per year by nonstudent civilian males aged 18–64 are presented in Figure 1 for the 1975–1992 period.[6] Separate trends are shown for whites and nonwhites and indicate that the latter have much lower rates of activity.[7] For both racial groups, annual hours largely follow the business cycle; in particular there was a severe dip during the early-eighties recession. However, during the subsequent recovery mean annual hours failed to return to the levels of the late 1970s.

Further insight into what has been happening to the distribution of annual hours can be gleaned from examination of Figures 2a–2d. Histograms are drawn for the recession years of 1975 and 1991 and two years in a cycle upswing, 1979 and 1989. The distributions are bimodal; the mode is 2080 in every year,[8] with another peak at zero. One noticeable change in the distribution is the greater proportion of males working zero hours in the later years; the figure increased from 7.7 percent in 1975 to 9.7 percent in 1991. For the same four years, Table 1 gives the percentage of the sample in four hours categories: 0, 1–2079, 2080, and >2080. This shows that the fraction not working has increased substantially—by 2 percentage points (or 26 percent) using the 1975–1991 comparison and by 1.4 percentage points (or 19 percent) using the 1979–1989 comparison. The proportion at the other end of the distribution, working more than 2080 hours, has also increased. These increases have been at the expense of the proportion of working males who work less than the equivalent of FTFY. Additionally, comparison of 1991 with 1975 shows a 1.8 percentage point fall in the proportion at the mode of 2080; but this is not true for the comparison of 1989 and 1979. This evidence points to a bifurcation of the hours distribution, with a hollowing out of the middle and an increase in the mass at the extremes.

Figure 1 here

Figure 2 here

TABLE 1

Percentage of 18–64-Year-Old Males in Annual Hours Categories

	Annual Hours			
Year	0	1–2079	2080	>2080
1975	7.7	31.1	34.6	26.6
1991	9.7	29.2	32.8	28.3
1991−1975	2.0	-1.9	-1.8	1.7
1979	7.4	29.7	34.2	28.7
1989	8.8	26.1	34.7	30.4
1989−1979	1.4	-3.6	0.5	1.7

Source: Own calculations, 1976, 1980, 1990, 1992 CPS.

3. FORGONE HOURS: A MEASURE OF LABOR UNDERUTILIZATION

Consistent with our finding that the mode (and median) of the annual hours distribution is 2080 hours over the entire 1975–1992 period, about one-third of males report working the equivalent of 52 weeks at 40 hours per week. In the remainder of this paper, this point in the hours distribution is taken as the social norm for full utilization of labor in a paid, market setting. We define individuals working less than 2080 hours per year to be less than fully active, and labor underutilization is measured by 2080 less the number of hours worked by individuals with less than this norm. The latter corresponds to forgone hours—the labor input not utilized due to failure to work FTFY. As a measure of labor market inactivity, forgone hours has advantages over alternative indicators, such as jobless rates, nonparticipation rates, or unemployment rates, which do not reflect durations of nonwork or part-time employment.[9] In Sections 3–5, we present estimates of the number of forgone hours, ignoring differences in the productivity of hours across individuals. Section 6 summarizes the patterns of labor underutilization when hours forgone are weighted by the predicted wage rate of the individuals.

Proportion with Positive Forgone Hours (percent PFH)

Figure 3 shows the proportion with positive forgone hours (percent PFH)—a consequence of working less than the 2080 norm—in the aggregate, and separately for whites and nonwhites. In 1992, about 39 percent of males worked less than the equivalent of FTFY; the corresponding figures for whites and nonwhites were 36 percent and 50 percent, respectively. There has been a slight narrowing of this racial difference over time. As with mean annual hours, the graph largely traces the business cycle. What little sign there is of a trend is downward: percent PFH was lower in the late eighties boom than at a similar point in the cycle in the late seventies.

Figure 3, 4 and 5 here

Figures 6a–6d show the trends in the percent PFH indicator for race/age and race/education groups. For both whites and nonwhites, young male adults (18–24 years) are most likely to be less than fully active; around 59 percent of whites and 66 percent of nonwhites in this age group had PFH in 1992.[10] Between 1975 and 1992, males aged 55–64 were the only age group to show an upward trend in percent PFH. By the end of the period, the rate of labor underutilization of the oldest group was almost as high as that for the youngest group, for both races. Middle-aged males (40–54 years) have the highest rates of labor market attachment. Typically, less than 30 percent of whites and 45 percent of nonwhites in this age group work less than FTFY.

The disaggregation by education (Figures 6c and 6d) indicates that the percent PFH indicators are highest for high school dropouts, and that these rates have been increasing over time. This is particularly true of white dropouts, who ended the period with 62 percent either completely inactive or working but less than FTFY (up from 52 percent in 1975), a rate almost as high as that for nonwhite dropouts (65 percent). For whites, the clearest difference by education is between high school dropouts and all others. This is not true for nonwhites, for whom the percentage point difference is about the same between each education category. Nonwhite college graduates were the only group to experience a decline in percent PFH over the 1975–1992 period. While at the beginning of the period the rate for this group was closer to that of white high school graduates than to that of their college-graduate white counterparts, this was no longer true by the end of the period.

The disaggregation by education reveals an upward trend in the percent PFH among high school dropouts. In Figures 7a and 7b, the rates for this education group are disaggregated by race and age. For both white and nonwhite high school dropouts, males aged 18–24 have the highest percent PFH—about 73 percent for both nonwhites and whites. However, this is the only age category within the group of high school dropouts not to experience an increase in this fraction. The upward trend is most steady for the oldest age group. The result is a narrowing of the age

Figure 6 here

Figure 7 here

differential in the proportion of high school dropouts who have PFH. Disaggregation of the percent PFH indicator for high school graduates, with no college education, by age reveals the same pattern (not shown).

This finding is at odds with the general perception that the young, least-educated groups have experienced the greatest labor market deterioration in recent years. Juhn (1992) reports that, for blacks, the decline in the labor market participation of high school dropouts over the 1967–1987 period was most pronounced for the group with the least labor market experience. A number of factors may explain why we do not find this. The principal difference between our analysis and that of Juhn is the measure of labor utilization. She examined weeks worked as a proportion of 52, while our results are based on whether the individual works less than 2080 hours. Further, the periods of analysis differ. Juhn's results show that for white high school dropouts, participation of the least-experienced group did not fall over the 1973–1975 to 1985–1987 period, as it did for older males in this education group, but comparing 1985–1987 with 1967–1969 reveals a decline for the younger age group consistent with that for the others. Another important difference lies in Juhn's examination of *blacks*, as opposed to nonwhites. It is plausible that there has been a decline in the labor market attachment of young black high school dropouts that is not evident when all nonwhites are taken together.

Our finding that the activity of young high school dropouts is falling less rapidly than is the case for older dropouts is inconsistent with the proposition that inactivity has been increasing among high school dropouts because, as more individuals graduate from high school, on average, the new generation of dropouts possess less unobservable human capital than their predecessors and, consequently, have fewer labor market opportunities.

Broken down by age, the percent PFH has been increasing only for older workers—those aged 55–64. Figures 7c and 7d show the rates for this age group disaggregated by race and education.

Among whites and nonwhites, the rate is increasing for older men of all education levels.[11] However, the increase has been steepest for the more-educated, resulting in some narrowing of the education differential within this age band over time.

Mean Forgone Hours among Those with Positive Forgone Hours (MFH/P)

Figure 4 tracks trends in a measure of the **extent** of labor underutilization—mean forgone hours as a percent of 2080 among males with PFH. This measure is equal to 0 when all individuals work 2080 hours or more, and is equal to 1 when all of those less than fully active are completely inactive. Unlike the **rate** of labor underutilization (percent PFH), there is a clear upward trend in the **extent** of labor underutilization; it increased during the early eighties recession, never recovered in the late eighties, and increased again in the early nineties recession. By 1992, MFH/P exceeded .52, up from .45 in 1975. This rate is equivalent to an average of 1090 annual hours of forgone work among those with less than full utilization, an increase from the level of 941 in the recession year of 1975.

While Figure 3 reveals no long-term increase in the percent PFH, Figure 4 shows that among men with PFH, work effort has fallen. Comparison of Figures 3 and 4 also indicates that while nonwhites are less active by both measures, the difference between nonwhites and whites in percent PFH (Figure 3) is greater than the race difference in MFH/P (Figure 4). The upward trend in MFH/P holds for both races. The greater sensitivity of labor market activity of nonwhites to the business cycle is again seen here.

Figures 8a and 8b show MFH/P by race and age. The picture here is quite different from the age disaggregation of the percent PFH indicator (Figures 6a and 6b). While the latter rate was found to be highest among the youngest age group, the oldest age group—those aged 55–64—has the greatest MFH/P. In fact, for whites, the youngest age group has the next to lowest MFH/P.[12] The

Figure 8 here

explanation is that while older males are less likely to work less than 2080 hours than are young males, older males are more likely to be completely inactive because of retirement.

MFH/P has been increasing for all age categories within both races. The increase among older whites has been greater than that among older nonwhites, indicating a narrowing of the race differential for this group. However, the opposite is true for the 25–39-year-old group.

Figures 8c and 8d show an upward trend in MFH/P for all education levels. For whites, the difference in MFH/P across education groups has remained roughly constant. In contrast, MFH/P has increased most rapidly for the nonwhites with the highest education levels. By the end of the period, MFH/P was approximately the same for white and nonwhite high school dropouts.[13]

Mean Forgone Hours among Population (MFH)

A summary measure of labor utilization among working-age males is obtained by multiplying percent PFH (Figure 3) by MFH/P (Figure 4). This measure is equal to mean forgone hours across the entire working-age male population (MFH), with those working at, or above, the 2080 norm counted as having zero forgone hours.[14] The trend in the measure is shown in Figure 5. The MFH index again has a range of 0–1, with the lower and upper limits indicating a fully active and completely inactive population, respectively. Over the 1975–1992 period, MFH displays a slight upward trend, reflecting the product of virtually no trend in the percent PFH (Figure 3) and a pronounced upward trend in MFH/P (Figure 4). By 1992, the MFH index had reached a value of over .2, up from less than .18 in 1975. For nonwhites, the index stood at .29 in 1992 (up from .27 in 1975), compared to an index of .18 for whites (up from .16 in 1975).

One interpretation of the aggregate figure for 1992 (.2) is that total hours forgone due to individuals not working at the full-time, full-year norm are one-fifth of the total number of hours which would have been worked if all males had met this norm.[15] The complement of the index is akin to a capacity utilization ratio, suggesting that the overall rate of male labor capacity utilization

was slightly less than 80 percent in 1992, down from 82 percent in 1975. This aggregate hours deficit is equivalent to that which would arise if 20 percent of males were completely inactive. Because only about 11 percent of males were jobless for a year or more in 1992, those who did work, but for less than 2080 hours, contributed a substantial amount to total forgone hours.

Figures 9a–9d show MFH across the working-age male population, broken down by race/age and race/education groups. By this summary measure, labor underutilization is greatest—and has been increasing most markedly and steadily—for the oldest age group. Young male adults are the second least active: mean forgone hours for this age group show the greatest sensitivity to the cycle and also show an upward trend. There is a large gap between the MFH of both older and younger males and that of 25–54 year olds, although the forgone hours of the 25–39-year-old age group also appear to be increasing slightly over time. The trends disaggregated by education show the same general picture as for the two components of the measure—labor underutilization is by far the greatest for high school dropouts and has been increasing most rapidly for this group.

4. DEMOGRAPHIC STANDARDIZATION OF FORGONE HOURS TRENDS

The story of the previous section is one of increasing underutilization of male labor, due to a decrease in the work effort of those working less than FTFY, rather than an increase in the proportion of the male population that fails to meet this norm. Labor underutilization is greatest among nonwhites, the oldest and youngest age groups, and for the least-educated. Any change in the fraction of the population accounted for by these demographic groups has a direct impact on aggregate activity rates. Over the 1975–1992 period, the nonwhite population grew from 15.4 percent to 23.2 percent of 18–64-year-old males. This will have contributed to an increase in the aggregate underutilization of labor. Changes in the age and education structure of the population have

Figure 9 here

had the opposite effect. The oldest, youngest, and least-educated of working-age males, all of whom have high forgone hours, have all been declining in relative size.[16]

In order to identify the net effect of demographic change on labor utilization, and to gauge the magnitude of any demographic effect, we have standardized our three indicators of inactivity—percent PFH, MFH/P, and MFH—on the race/age/education composition of the 1975 population. The demographically standardized trends in these indicators, as well as the actual trends, are presented in Figures 10a–10c.[17] Had the demographic structure of the population remained as it was in 1975, but cell-specific activity changed as it actually has, labor underutilization would have been greater than has actually been experienced in every subsequent year.[18] This is true, in particular, for the percent PFH. Indeed, if the demographic composition of the population had remained as it was in 1975, this fraction would have displayed an upward trend—from .39 to .44. This finding indicates that the increased underutilization of male labor is not merely an artifact of a changing population structure; in fact, the decline in work effort would have been even greater if there had been no change in demographic composition.[19] To better understand the impact of demographic change on labor underutilization between 1975 and 1992, this effect has been further decomposed into the separate effects of age, race, and education. This has been achieved by following the method introduced by Das Gupta (1978), which requires standardizing using the mean of the two end-point populations (1975 & 1992) as the base, rather than the 1975 composition used in Figures 10a–10c.[20] The results are presented in Table 2 for all three of our indicators of labor utilization. The third row shows the *actual* difference between 1992 and 1975 in the three measures.[21] All changes are positive, indicating greater underutilization in all dimensions in 1992 in comparison with 1975.

The fourth row of Table 2 shows the difference in each of the measures between the two points in time that is *not* due to demographic change; this is the "rate effect."[22] It is the change in

the mean attributable to the change in the rate of underutilization within race/age/education cells. These

Figure 10 here

TABLE 2

Decomposition of Change in Labor Underutilization, 1975–1992

	Underutilization Measure		
	Fraction with hours <2080 (pct. PFH)	Mean Forgone Hours-Positive (MFH/P)	Mean Forgone Hours-All (MFH)
1975	0.3880	941.4	365.2
1992	0.3905	1089.9	425.6
Actual Difference: 1992−1975	0.0025	148.5	60.3
Difference not due to demographics	0.0472	187.4	126.3
Difference due to demographics:			
Total	-0.0447	-38.9	-66.0
-Race	0.0104	89.7	16.5
-Age	-0.0123	-10.4	-17.1
-Education	-0.0428	-118.2	-65.4

Source: Own calculations, 1976 and 1993 CPS.

within-cell changes are, of course, due to a wide variety of potential causes, including changes in macroeconomic conditions, changes in labor market structure and institutions, changes in worker preferences, and changes in public policy. In all cases the rate effect is greater than the actual changes, implying that the demographic effects have partially offset the underutilization effect of these other factors. The disparity is most substantial with respect to the percent PFH indicator, although for MFH the rate effect is still more the twice the size of the actual change. Comparison of the rate effects with the 1975 values of the indicators reveals relatively large declines in cell-specific work effort; the rate effects are approximately 12 percent, 20 percent, and 35 percent of the 1975 values, respectively, for the three measures read from left to right in Table 2.

The differences between the rate effect and the actual changes point to substantial and offsetting demographic effects, which are shown in the fifth row of the table.[23] These figures show the change in the mean arising only from change in the distribution of the population across race/age/education cells, holding the rates within these cells constant.[24] The final three rows of the table show the separate contribution of changes in the race, age, and education structure of the population to these demographic effects. As suggested above, the increase in the nonwhite proportion of the population has raised the underutilization of labor, by all three indicators, while changes in the age and education composition have increased work activity. For all three measures, changes in the population's education level has had the largest impact on the utilization of labor resources. The steep decline in the fraction of the population who have not graduated from high school and the increase in those with at least some college education, ceteris paribus, reduced the percent PFH by more than 4 percentage points (11 percent) and reduced MFH/P by 118 hours (12.6 percent). The changes in the race and age structure of the population have had roughly equal, but opposite, impacts on both the percent PFH and MFH indicators. However, the positive race effect on MFH/P has been much greater than the negative age effect.

5. REASONS FOR FORGONE HOURS

The results of the previous section leave unanswered the question of what, if not demographics, accounts for the increase in the underutilization of male labor, as measured by MFH. Underutilization of labor can arise from failure to work at all in the year, part-year work, and/or part-time work. Figure 11 displays the fraction of total forgone hours attributable to each of these three causes.[25] In 1975, working for only part of the year accounted for 46 percent of total forgone hours, a slightly larger share than not working at all (i.e., being jobless) (44 percent). By the end of the period, however, the relative contribution of these two causes had been reversed, with joblessness accounting for around 51 percent of total forgone hours and part-year inactivity accounting for 37 percent. The contribution of part-time employment is small in comparison with the other two causes, roughly constant at around 13 percent of the total. The story is similar when disaggregation is made by race (trends are not reported), with the exception that joblessness was the dominant cause of forgone hours among nonwhites throughout the entire period.

The above analysis suggests that the primary cause of decline in the utilization of male labor is an increase in year-long joblessness. Further insight can be gained by examining the reasons given by CPS sample members for working less than the FTFY norm. Using these responses, forgone hours have been attributed to the following reasons (see Appendix):

- no work, or no full-time work, available
- illness/disability
- retirement
- voluntary part-time work
- housework
- other

The proportion of forgone hours accounted for by each reason is presented in Figure 12 for the entire 1975–1992 period. These proportions are also given in Table 3 for comparable recession (1975 and 1991) and boom (1979 and 1989) years.

Figure 11 here

Figure 12 here

TABLE 3

Percentage of Forgone Hours Due to Each Reason, Selected Years

Reason	All				White				Nonwhite			
	1975	1991	1979	1989	1975	1991	1979	1989	1975	1991	1979	1989
No (Full-Time) Work Available	42.8	42.2	30.7	33.4	42.4	39.5	28.8	30.5	44.1	48.0	36.4	39.7
Illness	31.7	27.3	35.0	30.4	30.2	26.9	34.6	29.6	36.8	27.9	36.2	31.9
Retirement	10.6	15.2	13.7	17.7	12.6	19.1	16.2	22.4	4.0	7.0	5.7	7.8
Voluntary Part-Time	3.5	3.7	3.8	4.6	3.9	4.2	4.4	5.5	2.5	2.5	2.0	2.8
Housework	1.4	2.3	1.7	2.7	1.3	2.2	1.7	2.5	1.7	2.7	1.9	3.1
Other	9.9	9.3	151	11.2	9.6	8.1	14.3	9.6	10.8	119	17.7	14.6
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Own calculations, 1976, 1980, 1990, 1992 CPS.

With the exception of the late 1970s boom, a lack of employment or full-time employment opportunities accounts for the greatest fraction of forgone hours. On average, across the period, the unavailability of (full-time) work accounts for around 40 percent of total forgone hours. This fraction is particularly sensitive to the business cycle, which is to be expected given inactivity due to unemployment is included in this category. A lack of employment opportunities accounts for a greater fraction of the forgone hours of nonwhites (48 percent in 1991) than of whites (40 percent). Further, comparison of similar points in the cycle reveals an upward trend in this fraction for nonwhites (Table 3).

The second major reason for the forgone work hours of male labor is illness, which accounted for around 32 percent of forgone hours in 1975 and 26 percent in 1992.[26] The fraction dipped sharply during the early eighties, due to the increase in the proportion of inactivity arising from a lack of employment opportunities. This was also a period of retrenchment for Social Security Disability Insurance (DI), suggesting that the propensity to report illness as a reason for nonwork may be affected by the availability of DI. Consequently, not all of the forgone hours attributed to this reason may represent physiological constraints on the utilization of labor. This said, the magnitude of the contribution of illness indicates that, even in a developed country, the health of the population is an important determinant of the utilization of labor resources.

In 1975, 10.6 percent of forgone hours were due to early retirement; by 1992, this figure had increased to 15 percent. Retirement accounts for a much lower fraction of the forgone hours of nonwhites (7.0 percent in 1991) than of whites (19 percent). Focusing on older males—the age group with the highest level and rate of increase in forgone hours—while illness began the period as the main determinant of forgone hours, particularly for nonwhites, by 1992 retirement was the major reason for labor underutilization among whites, and illness and retirement contributed about the same fraction among nonwhites (Figures 13a and 13b). By 1992, retirement was given as the reason for

Figure 13 here

almost 54 percent of the forgone hours of white males aged 55–64, with illness contributing 25 percent. The comparable figures for nonwhites were 36 percent and 34 percent, respectively.

The increase in potential work hours lost to early retirement may not reflect any inefficiency in the utilization of labor but simply the greater propensity in an increasingly wealthy society to choose leisure over work. However, such choices may be non-optimal, from a societal perspective, if the tax/transfer system has severely distorted the price of leisure. Additionally, early retirement may be reported by individuals who have been unsuccessful in finding work and discouraged from continuing to search.

On average over the period, voluntary part-time work has accounted for around 4 percent, or so, of forgone hours, with the fraction for whites about two-thirds above that for nonwhites and little evidence of a consistent trend for either racial group (Table 3). In 1975, housework contributed 1.4 percent to the forgone hours of males; by the end of the period this fraction had increased by about 1 percentage point.

Actual and standardized MFH (in absolute value) for the three main reasons for forgone hours—no (full-time) work available, illness and retirement—are presented in Figures 14a–14c.[27] Standardization has little effect on the trend in MFH due to a lack of employment opportunities. The graph mainly reflects the cycle, although the low points of the late 1970s are never achieved in the 1980s, resulting in a slight upward trend in hours lost to this reason.

MFH due to reported illness falls from 1975 to 1982, but shows an upward trend from 1984 onwards. The standardized mean shows an upward trend throughout the 1975–1992 period, indicating that the fall during the first part of the period is simply an artifact of demographic change. The increase in standardized MFH due to reported illness since 1984 is marked and, as yet, ill understood.[28] MFH due to retirement shows a pronounced upward trend, almost doubling between 1975 and 1988, before levelling off. Standardization indicates that the increase in retirement hours

Figure 14 here

would have been even greater had there not been a decline in the proportion of males aged 55–64. Comparison of the trends in mean forgone hours due to illness and retirement in Figures 14b and 14c respectively is suggestive of a direct relationship between the two. From 1975–1984 retirement hours were increasing rapidly, while illness hours were declining. When retirement hours levelled off in the late eighties, forgone hours due to illness began to increase. These trends are merely suggestive, but they raise the question of the extent to which retirement and disability represent substitutable states of inactivity. The issue deserves closer examination since any interaction would have important consequences for the design of policy in relation to pensions and Disability Insurance.

In Table 4 we show the changes in actual and standardized mean forgone hours by reason between two recession years (1975 and 1991) and two boom years (1979 and 1989). All comparisons show the increase in forgone work hours. From 1975 to 1991 mean forgone hours increased by about 42; the increase from 1979 to 1989 was 33. Standardizing for demographic change, the increases are much greater (111 and 65 respectively). Comparing the two recession years, the increase was greater for whites than nonwhites, while the opposite is true of the two boom years. The table reveals that almost all of the *actual* increases in forgone hours across the periods are due to a decline in the availability of (full-time) work and an increase in early retirement. The increase in mean forgone hours due to the latter reason between 1975 and 1991 was greater than that for the former (23 and 16 hours respectively), but both contributed approximately equally (19 hours) to the difference between 1979 and 1989.

There is a noticeable difference between the two racial groups. For whites, retirement explains almost all of the increase in mean forgone hours. This is particularly true for the 1975–1991 comparison, in which case the increase in forgone hours due to a lack of employment opportunities is relatively minor (2 hours). Between 1979 and 1989, mean forgone hours due to this reason increased by less than half of that due to retirement (22 hours) for whites. For nonwhites, a lack of

TABLE 4

Change in Mean Forgone Hours by Reason, Selected Years

	Change in Actual and Standardized Means[1]							
	1991−1975				1989−1979			
	Actual	White	Nonwhite	Standardized	Actual	White	Nonwhite	Standardized
Total	42.23	29.01	13.88	110.70	32.76	17.63	42.08	65.13
Reason								
No (Full-Time) Work Available	15.55	1.78	27.96	37.99	19.89	10.23	32.62	29.76
Illness	-4.89	-2.92	-45.49	25.86	-5.1	-9.42	-7.01	9.22
Retirement	23.31	26.77	17.95	32.72	18.99	22.02	13.20	22.37
Voluntary Part-Time	2.00	2.42	0.28	3.82	4.09	4.06	4.95	6.81
Housework	4.49	3.67	5.52	6.16	3.96	2.90	6.73	4.56
Other	1.77	-2.71	7.67	3.15	-9.07	-12.15	-8.42	-7.59

Source: Own calculations, 1976, 1979, 1990, 1992 CPS.

[1]Standardized means hold the race-age-education composition constant at the 1975 levels.

employment opportunities is reported as the major reason for the increase in forgone hours. For this group, the increase in forgone hours due to retirement between 1975 and 1991 was less than two-thirds of the increase due to there being no (full-time) work available; the respective figure for the 1979–1989 comparison is two-fifths. These results suggest that while white males are increasingly choosing to underutilize their labor resources by opting for early retirement, nonwhite males are more likely to be working less because they have fewer labor market opportunities. However, some caution should be exercised. It could be that employment opportunities have declined equally for whites and nonwhites, but given the former have greater access to pensions, they are more likely to have responded to the slacker labor market by withdrawing into retirement.

Standardization has a marked effect on the results. While the actual figures show mean forgone hours due to illness declining, the opposite is true when the demographic composition of the population is held constant (at 1975 proportions). The effect is particularly dramatic for the difference between 1975 and 1991, in which case the standardized figures show that mean forgone hours due to illness increased by four-fifths of the increase due to retirement. After standardization, no (full-time) work available is the leading cause of the increase in forgone hours irrespective of the period chosen for comparison. The increase in standardized forgone hours due to retirement was 86 percent of the increase due to a lack of employment opportunities between 1975 and 1991 (75 percent 1979–1989). Consequently, understanding the increasing underutilization of U.S. male labor does not require an explanation for increasing early retirement alone; according to self-reports, the labor market is offering men fewer employment opportunities.

Voluntary and Involuntary Forgone Hours

Underutilization of labor arising from constraints placed on individuals provokes quite a different reaction from that due to individual choice. For this reason, we have divided forgone hours into those arising from voluntary (retirement, voluntary part-time work, and housework) and

involuntary (no work available and illness) reasons for inactivity.[29] Such attribution is obviously problematic. For example, an individual who wants employment but has become discouraged from looking may report himself retired. Similarly, an individual may choose not to work, but may report illness consistent with an effort to qualify for disability benefits, or to indicate a more acceptable reason for not working.

With these caveats stated, the fraction of forgone hours due to voluntary reasons are reported in Figure 15 for the entire population of prime-age males, and for whites and nonwhites. Voluntary forgone hours accounted for almost 16 percent of the total in 1975. With the exception of decreases in this percentage during the early eighties and nineties recessions, this percentage has increased substantially over time, reaching almost 22 percent in 1992—an increase of 38 percent. This increase is largely due to the rise in early retirement. The fraction of voluntary forgone hours for nonwhites is substantially below that for whites, peaking at about 13.5 percent in 1989, which is still less than the minimum over the period experienced by whites. The scale of this difference supports the conclusion that, among those who are less than fully active, nonwhites are much less likely to be in this state through choice.

Figures 16a–16d show the fraction of forgone hours due to voluntary reasons for race/age and race/education groups. Voluntary reasons are by far the most pervasive among men in the oldest age group and have been accounting for a rapidly increasing share of their forgone hours, again reflecting the increase in early retirement. By the end of the period, voluntary reasons accounted for 60 percent of the forgone hours of whites aged 55–64 and 40 percent for nonwhites in this age group. Thus, while the oldest age group utilizes their potential labor input the least, they are the most likely to be voluntarily underutilizing their potential. This distinguishes the experience of older males from that of young male adults, the other group with high levels of labor underutilization. While college graduates have low levels of underutilization of labor, most of it is voluntary. Exactly the opposite

Figure 15 here

Figure 16 here

holds for the low-education groups, where the level is high but the voluntary portion is low. This is particularly true for high school dropouts, although the voluntary proportion is increasing. In 1975, 14 percent of the forgone hours of white high school dropouts was voluntary; by 1992 the figure was 20.5 percent.

6. PRODUCTIVITY-WEIGHTED FORGONE HOURS

In Sections 3–5, we explored patterns of labor underutilization using raw hours of work and nonwork as the relevant indicators of worker activity. Mean forgone hours (MFH) was the basic indicator of the quantity of labor resources that are not fully utilized. This measures the quantity of person hours that were utilized in market activities, relative to the potential number of hours that could have been utilized. This indicator, however, ignores the fact that the labor market values the work hours of some persons more than the work hours of others; skill and education differences in wage rates provide evidence of these differing values. MFH does not reflect the potential productivity of the labor that is underutilized; all forgone hours are weighted equally.

In this section, we summarize the effects on the patterns of labor force underutilization of **weighting** the hours of nonwork of individuals by estimates of the marginal value of these hours. The weights we use are the predicted hourly wage rates of the individuals. The resulting measure of labor underutilization, mean weighted forgone hours (MWFH), can be interpreted as the economic productivity that is forgone because some males fail to work FTFY, or 2080 hours per year.

Estimation of Hourly Wage Rates

In using hourly wage rates to weight hours of nonwork, we face the usual problem of these being unobservable for individuals who are not working. We deal with this problem by estimating a wage function from data on workers, and using the parameter estimates to predict a wage for the entire

sample of working-age males, given each individual's characteristics. The potential bias induced by estimating a wage function from data on workers alone is dealt with by the standard selectivity correction (Heckman, 1979).[30] Since we seek a measure of marginal productivity in the labor market, we use data on wage and salaried workers only in our estimation.[31] While we recognize that labor market distortions cause observed wages to be an imperfect measure of marginal productivity, we accept these market values as the best indicators available.

The null hypotheses of no structural differences in the determination of the employment status and wages of the two racial groups were tested by LR and Chow tests; both tests indicated rejection of the hypotheses at the 1 percent level using the 1976 CPS data.[32] On the basis of these results, separate wage functions were estimated for whites and nonwhites in every year.[33]

The empirical specification of the hourly wage equations was arrived at by sifting through the CPS to identify those variables that are both non-endogenous determinants of market productivity and recorded in every CPS year from 1976 to 1993. Two variables are included in the probit models of employment status, but excluded from the wage functions—exogenous nonlabor income[34] and the state-specific unemployment rate.[35] The latter was initially included in the wage function but was found insignificant.[36] LR tests indicated that family composition variables—marital status, number of children, a dummy for any children and number of persons in the family—could not be excluded from the wage functions.[37]

The estimated coefficients of the wage functions were used to predict the market wage of every individual in the sample, for each year, irrespective of whether they worked.[38] These predictions were multiplied by the forgone hours of each individual to obtain the value of weighted forgone hours for each individual.[39]

Mean Predicted Hourly Wages

Figure 17a shows mean predicted real hourly wages for the entire male population aged 18–64, and for the two racial groups. For the aggregate male working-age population, the mean predicted wage, standardized on the 1975 population composition, is also shown.[40]

The trend in the mean predicted wage for the entire working-age population is similar to the actual mean wage of wage and salary workers over the period (see Buron, Haveman, and O'Donnell, 1994, Figure 11b). There are a few noticeable differences, however. First, for all years, the mean predicted wage over the entire sample is lower than the mean wage for those males who worked. This indicates that the characteristics of nonworkers are such that they have lower potential labor market returns than do workers. A second difference is the greater downward trend in the predicted real wage across the sample, relative to that of the actual real wage of workers, indicating that the potential market returns of nonworkers have deteriorated more rapidly than the actual returns of those remaining in employment. This pattern is also expected, given that nonemployment rates are higher for the less-skilled and that the real wages of this group have fallen rapidly over the period.[41]

We also calculated mean predicted wages for those individuals with positive forgone hours, i.e., those working less than 2080 hours (Figure 17b). As expected, the mean for this group is lower than that for all males, and the downward trend is more pronounced. Both results, which have important implications for comparisons of weighted and unweighted forgone hours trends, follow from the fact that the low-skilled are disproportionately represented in the group with positive forgone hours.

Mean Weighted Forgone Hours (MWFH)

Figure 18 shows mean weighted forgone hours (MWFH) for all males, and for the two racial groups.[42] As with the mean forgone hours (MFH) measure of labor underutilization, the weighted measure shows a peak during the recession of the early eighties (see Figure 5). Although MWFH

Figure 17 here

Figure 18 here

was slightly higher in the late eighties boom than it was in the late seventies, the upward trend over the entire period is not as pronounced as that for unweighted forgone hours (MFH). The explanation for this difference is that real wage rates have been falling for many of the groups with the greatest reductions in work effort—younger males, those with low educations, and racial minorities.[43] As a result, a declining set of weights is attached to the forgone hours of those population groups with among the greatest increase in forgone hours.

A second striking difference between aggregate MWFH (Figure 18) and aggregate MFH (Figure 5) is the smaller racial disparity in the former measure. This is due to the fact that while nonwhites, on average, work fewer hours than whites, they also have lower wage rates.[44]

The age disparity in labor underutilization also differs between weighted and unweighted measures of forgone hours. Figures 19a and 19b present the trend in MWFH for four age groups distinguished by race; the analogous figures for MFH are Figures 9a and 9b. Using the weighted measure, MWFH, the oldest age group has even higher levels of labor underutilization relative to other age groups than is the case for the unweighted measure. Further, while the youngest age group clearly has the second highest MFH, generally, it has the second lowest levels of MWFH. Again this difference reflects wage differences: younger men have lower predicted hourly wage rates than do older working-age males.[45] Disaggregation by age also reveals that an upward trend in MWFH is readily apparent for only the oldest group.

Weighting of forgone hours reduces the underutilization differential by education level (Figures 19c and 19d) from that observed in Figures 9c and 9d. Again, this is expected, because the predicted wage rate (which serves as the weighting factor) is lower for groups with low levels of education; hence, their high levels of forgone hours are multiplied by a lower weight. Weighting also affects the measured trends in labor underutilization when disaggregated by education. While the unweighted measures (Figures 9c and 9d) show labor underutilization increasing most dramatically for

Figures 19 here

the least-educated, once differences in potential productivity are taken into account, college graduates actually show the greatest increase in underutilization over the 1975–1992 period.

It is apparent, from these results, that productivity weighting of forgone hours markedly changes the pattern of labor underutilization. While there is a strong argument for weighting hours deficits by productivity differences across individuals in order to determine the aggregate production losses from less than full labor market activity, it must be recognized that the procedure disguises the low and falling activity of the least-skilled. Examination of both the unweighted and weighted indicators is required for a full understanding of labor market trends and the development of appropriate policy responses.

7. CONCLUSION

Trends in the utilization of male labor from 1975 to 1992 have been examined through four measures:

(1) the fraction working less than the equivalent of full-time full-year (percent PFH),

(2) mean forgone hours among those working less than FTFY (MFH/P),

(3) mean forgone hours for the entire male working-age population (MFH), and

(4) mean productivity-weighted forgone hours (MWFH).

Indicator (1) measures the rate of labor underutilization; indicators (2), (3) and (4) measure the extent of labor underutilization.

While there has been no long-term increase in the percent PFH indicator,[46] the extent of underutilization measured by MFH/P shows an upward trend for both whites and nonwhites. The net effect of these two patterns has been a slight upward trend in MFH. Weighting forgone hours by productivity makes any long-term increase less discernible.

Young adults are least likely to be fully active, but the percent PFH indicator has increased only for males aged 55–64. The percent PFH among high school dropouts has also increased. When disaggregation is made by both education and age, percent PFH is highest among young adults who are high school dropouts; however, this is the only age group among high school dropouts *not to* exhibit an increase in the proportion who are less than fully active over the 1975–1992 period.

While labor market attachment is certainly very low for young high school dropouts, it is not true, according to both the percent PFH and MFH/P indicators, that the work effort of this group has declined relative to that of other age/education groups in recent years. Work by Juhn (1992) shows that this conclusion does not hold for young *black* (as opposed to nonwhite) high school dropouts over the 1967–1987 period, when labor market activity is measured by weeks worked in the year. MFH/P are by far greatest for males aged 55–64, and this indicator has increased for all age and education groups.

In 1992, mean forgone hours were equivalent to those which would arise if 20 percent of males aged 18–64 did not work at all in the year. Stated alternatively, relative to the full-time full-year norm, in 1992 less than 80 percent of the potential male labor input was fully utilized, down from a utilization rate of 82 percent in 1975. These figures indicate a substantial, and growing, amount of potential labor resources not productively employed in the market.

Prime-age males (25–39 years) account for an increasing fraction of total forgone hours. Despite their high levels of labor underutilization, 18–24 year olds and high school dropouts are responsible for a declining share of total forgone hours. These trends reflect the changing structure of the population.

Standardization, designed to eliminate the effect of demographic changes on the trends, reveals that the net impact of demographic change has been to reduce levels of labor underutilization. If there had been no change in the race/age/education composition of the male population since 1975, but cell-

specific rates had changed as they did, the upward trend in underutilization would have been substantially *greater* than is observed in the raw data. In fact, once standardized, the percent PFH indicator shows an upward trend over the period. The demographic effect on labor utilization consists of a negative effect through the increasing proportion of nonwhites in the population, and positive effects due to a more-educated work force and declines in the size of both the youngest and oldest age groups. The change in education levels is by far the strongest of these demographic effects.

Our standardization results point to increasing underutilization of labor within homogenous populations. Some indication of why this is so can be obtained from examination of the reasons given for less than full labor market activity. The vast majority of forgone hours are due to individuals not working at all, or working for only part of the year. The relative contribution of these two causes has changed over time, such that year-long joblessness is now the major determinant of forgone hours.

A lack of (full-time) employment opportunities is the largest single reason offered for the failure to work at the 2080 hour norm. Roughly 40 percent of total forgone hours are attributable to this reason. This fraction varies markedly across the cycle; however, there is some evidence of a slight upward trend, particularly for nonwhites and high school dropouts. Illness and retirement are the second and third most important determinants of forgone hours. Forgone hours due to early retirement show the most marked upward trend over the period, such that this reason has been accounting for an increasing share of total forgone hours. Once standardization is made for demographic change, mean forgone hours due to illness have also shown a steady upward trend.

There is some evidence that illness and early retirement are, to an extent, interchangeable reasons for labor market withdrawal. For all males, and those aged 55–64, the fraction of total forgone hours accounted for by the sum of these two reasons is roughly constant across the 1975–1992 period. However, from 1975–1984, forgone hours due to illness were declining, coinciding with the period of retrenchment in disability transfer programs, during which eligibility requirements were

applied with increased stringency. From 1984 onwards, retirement hours have levelled off, while forgone hours due to illness have shown an upward trend. This latter period was also one in which application of the criteria for eligibility to Disability Insurance became more relaxed. While but suggestive, this pattern supports a direct negative—or substitution—relationship between inactivity due to disability and early retirement. This is an issue which deserves more detailed examination. If such substitution does exist, it has important consequences for the design of reforms to Social Security, private pensions, and Disability Insurance. Any curtailment in retirement programs might be expected to have substantial positive effects on claims made on disability programs.

Examination of the increase in forgone hours by reason reveals that a lack of (full-time) employment opportunities and retirement are the two major causes of the increase in the aggregate. The latter is dominant for whites and the former for nonwhites. Once standardization is made, increasing forgone hours due to illness also emerges as a substantial contributor to the increasing underutilization of male labor. Standardization also reduces the contribution of retirement to the increase in forgone hours relative to that of the nonavailability of work, such that the latter accounts for more of the increase in standardized mean forgone hours than any other reason. The increasing underutilization of U.S. male labor is not merely the result of more early retirement; employment opportunities do appear to be declining.

In addition to reporting levels and trends in potential work hours that are not used, we also weighted the unutilized hours of individuals by the hourly wage rates that these hours would be expected to generate, given prevailing market conditions. These predicted wage rates reflected the productivity potential of workers of various characteristics, such as age, education, and race. We referred to this measure as mean weighted forgone hours (MWFH).

The patterns revealed by the MWFH estimates show a number of differences from those of the unweighted counterpart (MFH). First, when productivity differences are taken into account through

the weighting procedure, the upward trend in overall labor underutilization is less discernible. As we explained in Section 6, this is due to the relative decrease in the real wages of precisely those groups that have recorded the greatest increases in forgone hours. Second, weighting forgone hours reduces the race disparity in labor underutilization. When the lower relative wage rates of nonwhites are used to weight their forgone hours, the shortfall from full potential labor utilization is camouflaged. Third, the low and declining relative wage rates for young and poorly educated workers affect estimates of the extent to which their patterns of labor resource utilization are changing. When we weight the forgone hours of individuals by their predicted wage rate, we find that the largest increases in labor underutilization over the period are for the most-educated, and not those with the lowest wages and skills. We emphasized that while the weighted hours measure is appropriate for assessing the full productivity losses to the economy from less than full labor activity, it tends to hide the low and falling activity levels of the least-skilled and most-disadvantaged workers.

Appendix: Attribution of Forgone Hours to Reasons

Allocation of forgone hours to the six reasons was made as follows. First forgone hours were split into hours per week and weeks deficits as described in note 25. These separate components were then allocated to the six categories.

In the CPS, civilian adults who did not work at all in the last year are asked for the main reason for not working (the CPS variable is **rnowrk**). Categories corresponding to ours are available for illness/disability, housework/family care, and retirement. Those whose response was "could not find work" were included in our category of "no (f-t) work available." The remainder of the responses were included in our "other" category. In each case, these individuals were counted as having 2080 forgone hours and were allocated to one of these categories.

If an individual works for at least one week, but less than 50, they are asked how many weeks, if any, they were unemployed (**wklkun**). We multiplied weeks in unemployment by 40 and included the total in forgone hours due to "no (f-t) work available." If weeks working and in unemployment sum to less than 52, the individual is asked what they were doing for most of the remaining weeks (**remact**). The available response categories correspond to those for not working at all in the year. Again we multiplied weeks spent in these activities by 40 and allocated them to the respective categories. If an individual works less than 52 weeks but more than 49, no enquiry is made as to what they did in the remaining weeks. These forgone hours were included in the "other" category.

Individuals who report working part-time for at least one week in the last year are asked for the main reason for doing so. Only four response categories are available: (i) could only find part-time, (ii) wanted part-time, (iii) slack work/material shortage, (iv) other. In order to allocate forgone hours arising from part-time work to our six categories, we supplemented the information on reason for working part-time last year with information available from current economic activity status, reason

for working part-time in the last week (if they usually worked part-time), and reason for working part-year.

Specifically, if an individual's reason for working part-time last year was (i) or (iii) from above, their forgone hours due to part-time work were allocated to the "no (full-time) work available" category. If their response was (ii), and, even if they worked part-time last week and reported usually doing so, they did not give "illness" or "housework" as their reason, and if their current activity was not housework, and if they did not give "illness" or "housework" as a reason for working part-year, then they were allocated to the "voluntary part-time" category. If their response was (ii) or (iv) and they reported working part-time in the last week and usually did so and gave illness (housework) as the reason for this, or if they gave illness (housework) as the reason for working part-year, then their part-time forgone hours were allocated to "illness" ("housework"). If their response was (ii) or (iv) and their part-time hours had not yet been allocated, they were included in "other."

If an individual usually works less then 40 hours per week but at least 35, they are not asked why they did not work 40 hours. The part-time hours of individuals in this group were allocated to the "other" category. If an individual usually worked more than 40 hours per week, but worked less than 2080 hours over the year as a consequence of working for only part of it, a negative number of forgone hours, equal to 40 less their usual hours/week multiplied by the number of weeks worked, was included in the "other" category.

Notes

[1]Those working at least 2080 hours are counted as having zero forgone hours. See Section 3.

[2]The analysis begins with the year 1975 (1976 CPS) since prior to 1975 CPS data on hours and weeks worked are only available in categorical form.

[3]Up to the 1983 survey, people in the military last year were identified through responding that they did not work at all, or for part of the year, because they were in the armed forces. From the 1984 survey onward, they were identified as being in the military last year if they listed their occupation at their longest job last year as the armed forces.

[4]Individuals were identified as being in school in the last year if they gave this as the reason for not working at all or working for only part of the year. Current students were identified through main economic status in the last week. Additionally, "school/housework" can be given as a reason for part-time work. Since the vast majority of males giving this reason were likely to be engaged in school, rather than housework, we excluded all of those in the category.

[5]Much of the analysis was repeated with students included. At the aggregate, there is little difference in the trends in labor underutilization with and without students. Obviously the absolute level of underutilization is greater when students are included and this is particularly true for the youngest age group and those with 13–15 years of school. The main differences in the detailed results when students are included are noted in the text.

[6]The standard method of calculating annual hours from the CPS is to multiply weeks worked in the last year by hours *usually* worked in a week. If reports of the latter correspond to modal hours, rather than mean hours, as seems likely, this estimate will be incorrect. In this analysis, weeks worked part-time and hours worked last week are also used in the estimation of annual hours. If an individual usually works full-time (i.e., at least 35 hours per week) and does not report working part-time in any week, then annual hours are estimated simply as the product of weeks worked and hours usually

worked per week. The same formula is used if an individual reports working part-time throughout the year. Individuals who usually work full-time but work part-time in some weeks are not asked for their hours during part-time employment. To fill in this data gap, we use information on individuals who worked part-time in the last week (not year) but who usually work full-time. We regress hours worked by such individuals in the last week on race, age, education, and usual hours/week and use the estimates to obtain a conditional expectation of the part-time hours/week of usually full-time workers. Annual hours are then calculated as the product of weeks worked full-time and hours usually worked per week, plus weeks worked part-time multiplied by the estimate of part-time hours. An analogous procedure is used to calculate the annual hours of individuals who usually work part-time but work full-time in at least one week.

[7]"Whites" refers to white non-Hispanics. "Nonwhites" are all others.

[8]The histograms are drawn with a bandwidth of 100 hours, making the range 2001–2100 the mode. With a bandwidth of 1, 2080 is the mode in every year.

[9]While the modal property of 2080 hours provides a strong argument for using this as the baseline against which to measure labor utilization, it must be recognized that a different reference point, to an extent, may give a slightly different picture of activity trends.

[10]If students are included in the sample, the respective figures for whites and nonwhites in this age category are 75 percent and 79 percent.

[11]For nonwhites, the trends in the rate show a great deal of volatility for older males with at least 12 years of schooling.

[12]If students are included, MFH/P among the youngest group is much higher, but still lower than for the oldest group.

[13]Disaggregation of MFH/P of dropouts reveals increasing trends for all age groups (figure not shown). For whites, the increase is least marked for 18–24-year-old high school dropouts.

Disaggregation also reveals increasing MFH/P for 55–64-year-old males of all education levels (figure also not shown).

[14]Since the hours worked beyond 2080 of those meeting this norm do not affect this measure, it should be interpreted as a measure of labor underutilization, rather than overall labor market activity. If those working above 2080 hours were given negative, rather than zero, forgone hours, the measure would simply be an additive transformation of mean annual hours. Trends in this indicator are shown in Figure 1.

[15]Forgone hours are less than 20 percent of actual hours worked since many males work more than 2080 hours per year.

[16]Change in the structure of the population has also changed the distribution of total forgone hours across demographic groups. Between 1975 and 1992, the share of forgone hours accounted for by nonwhites increased from about 23.5 percent to 33 percent. Within both racial groupings, the proportion of total forgone hours accounted for by the 25–39-year-old group has been increasing and that of the youngest group has been falling. There has also been dramatic falls in the share accounted for by high school dropouts, from 45 to 25 percent for whites and 65 to 42 percent for nonwhites between 1975 and 1992.

[17]The standardized rates are given by:

$$\sum_{ijk} \frac{n_{ijk}}{n} T_{ijk}$$

where i is age group (18–24, 25–39, 40–54, 55–64 years), j is race (white, nonwhite) and k is years of schooling (<12, 12, 13–15, 16+). n_{ijk} is the number of individuals in the ijk cell in 1975 and n is the size of the 1975 population. T_{ijk} is the mean of the dependent variable in the ijk cell in a given year.

[18]The choice of the 1975 population as the base for standardization, while having intuitive appeal, is, to an extent, arbitrary. However, experimentation with two alternatives, the 1992 population and the mean population 1975–1992, revealed, in this case, that the effect of standardization is insensitive to the choice of base.

[19]A caveat is required; it is possible that the impact of demographic change could be altered with the standardization for other factors in addition to race, age, and education.

[20]A disadvantage of the Das Gupta (1978) method is that it only allows decomposition of the demographic effect between two points. Liao (1989) extends the purging method of Clogg and Eliason (1988) to allow decomposition of a demographic effect operating over a time period, rather than between two points. However, this method is applicable only with binary dependent variables.

[21]Mean forgone hours are not divided by the benchmark of 2080 in this table.

[22]The rate effects in the table differ from those given by comparing the 1992 standardized values with the 1975 values in Figures 10a–10c because of the difference in the base populations used. The rate effects shown in Table 2 are given by

$$\sum_{ijk}\left(\frac{\frac{n_{ijk}}{n}+\frac{N_{ijk}}{N}}{2}\right)(T_{ijk}-t_{ijk}),$$

where lower cases refer to 1975 values and upper cases to 1992 values.

[23]The total demographic effect is given by

$$\sum_{ijk}\left(\frac{t_{ijk}+T_{ijk}}{2}\right)\left(\frac{N_{ijk}}{N}-\frac{n_{ijk}}{n}\right).$$

[24]It should be emphasized that these demographic effects are hypothetical; they show how the mean would change if the demographic composition changed but *cell-specific rates remained constant*. Since a change in the relative size of a cell may affect activity within it, mechanical standardizations, such as these, cannot reveal the actual contribution of changes in demographic structure to aggregate activity rates.

[25]Attribution was made by decomposing forgone hours (f) as follows:

$$f = 52*40 - w^{ft}h^{ft} - w^{pt}h^{pt}$$

$$= (52-w^{ft}-w^{pt})40 + (40-h^{pt})w^{pt} + (40-h^{ft})w^{ft} \qquad (1)$$

where w^{ft} = weeks worked full-time, h^{ft} = hours per week in full-time work, w^{pt} = weeks worked part-time, h^{pt} = hours per week in part-time work. The first term on the RHS of (1) represents hours forgone due to nonwork—in which case it equals 2080—or to part-year work. The second term on the RHS of (1) is hours forgone due to part-time work. The third term is zero if h^{ft}=40. Otherwise, this term represents negative forgone hours arising in cases where h^{ft}>40 but total forgone hours are positive, f>0. This residual term is small for those with f>0 and is not allocated to either nonwork, part-year, or part-time forgone hours. For this reason, the fractions reported in Figure 11 add up to slightly more than 1.

[26]With students included in the sample, school attendance was the second greatest contributor to forgone hours: 28 percent of the total in 1975 and 22 percent in 1992.

[27]These are the means across the population, rather than across those with positive forgone hours, since the latter would be directly affected by the size of the less than fully active population, which is a function of the cycle. As before, individuals working more than 2080 hours are counted as having zero forgone hours.

[28]Haveman and Wolfe (1990) examined changes in the prevalence of disability over the 1962–1984 period. They measured disability in three ways: (1) individuals who are constrained in the amount they are able to work because of health, (2) individuals who receive benefits from disability transfer programs reserved for the health impaired, and (3) individuals who meet either or both criteria. Using definition (3), they found that the percentage of working-age men classified as disabled rose from 9.5 in 1962 to nearly 15 percent in 1976, then decreased to 10.5 percent by 1984. The same, hump-shaped pattern was also found for the other two definitions, and was consistent with other studies of the prevalence of disability among males. However, the time series examined was prior to the late eighties, the period which shows the most rapid increase in hours forgone due to illness.

[29]The category "other" is not attributed to either group. The voluntary reasons are expressed as a fraction of forgone hours excluding those due to "other" reasons.

[30]A probit model of employment status is estimated. The estimated coefficients are used to generate predicted Inverse Mill's Ratios that are used to correct for selection bias in a wage equation estimated over workers alone.

[31]Earnings of the self-employed will consist of a combination of returns to labor and capital. There is no way of distinguishing between these in the CPS data. The self-employed are excluded completely from the estimation—they are used in neither the probit nor regression stage. The estimated coefficients are, however, used to estimate wage rates for the whole sample, including the self-employed.

[32]LR tests were used to test for structural differences in the probit models of employment status, and Chow tests used for the wage equation. A Wald test (Kennedy, 1992, p.109), which allows for the possibility of differences between the variance of the disturbances of the two regression equations, was also used with no inconsistency with the Chow test results.

[33]The parameter estimates for the two race-specific wage functions for each year are available from the authors, as well as the probit equations that provided the basis for the required Inverse Mill's Ratios.

[34]Nonlabor income presumed exogenous to the individual's employment status is used. This consists of family unearned income less Social Security payments to the individual, less public assistance to the family, less pension payments to the individual, less child support and alimony payments to the family.

[35]In principle, identification is ensured by nonlinearity and such exclusions are not necessary.

[36]All testing for appropriate empirical specification was undertaken using 1976 data.

[37]There is an argument that such variables are determinants of reservation, rather than market, wages and should not be included in the wage function. Justification for their inclusion lies in the counterargument that they affect investment in job-specific human capital, and so are valid proxies for productivity.

[38]Given we are predicting the hourly wage rate for the entire sample, we desire an estimate of potential market returns unconditional on current employment status; hence, the Inverse Mill's Ratios are not used in the wage predictions.

[39]While the weighted forgone hours of an individual provides an estimate of the earnings forgone by that marginal individual, these amounts can only be aggregated to indicate the total, or per capita, earnings forgone by the population under certain assumptions. The reason is that the weights used are current market wage rates, which reflect both the current demand for and supply of labor. If everyone were to work 2080 hours, there would be a large increase in the supply of labor, and the observed level and structure of market wages would differ from that observed in our data. Therefore, summing the product of existing market wages and 2080 hours provides an estimate of the earnings potential of the population only under the assumption that the level and structure of wage rates would not change

in any important way should the additional labor be supplied to the market (i.e., all labor demands are perfectly elastic). Comparison of actual earnings with this amount then represents earnings which are truly forgone only with this, rather unrealistic, assumption. Our use of weighted forgone hours is simply to allow for the fact that individuals differ in their market productivity, and a measure of the utilization of labor resources should reflect this.

[40]All earnings data were converted to $1993 values.

[41]A final difference between the trends is the greater volatility in the predicted wage of all nonwhites, in comparison with the mean actual wage of nonwhite workers. This difference may be attributable to the smaller sample size over which the wage functions of nonwhites are estimated.

[42]Unlike mean forgone hours, which were shown relative to a baseline of 2080, the absolute value of weighted forgone hours is shown.

[43]Older males are the exception—their work effort has declined while their real wages have held steady.

[44]This fact is even more pertinent in examining MWFH for those with PFH (not shown). In this case, the racial difference for MWFH is the opposite of that for the unweighted measure: nonwhite MWFH is lower than white MWFH over most of the period. The upward trend in this measure is apparent, but it is also less strong than the trend in the unweighted measure.

[45]Indeed, the youngest group actually has the lowest level of MWFH among those with positive forgone hours; these results are not shown, but are available from the authors.

[46]In the absence of standardization for demographic change.

References

Buron, Lawrence, Robert Haveman, and Owen O'Donnell. 1994. "Recent Trends in U.S. Male Work and Wage Patterns: An Overview." Mimeo, University of Wisconsin–Madison.

Clogg, Clifford and Scott Eliason. 1988. "A Flexible Procedure for Adjusting Rates and Proportions, Including Statistical Methods for Group Comparisons." *American Sociological Review*, 53: 267–283.

Das Gupta, Prithwis. 1978. "A General Method of Decomposing a Difference between Two Rates into Several Components." *Demography*, 15: 99–112.

Haveman, Robert and Barbara Wolfe. 1990. "Trends in the Prevalence of Work Disability from 1962 to 1984, and Their Correlates." *Milbank Memorial Quarterly*, 68: 53–80.

Heckman, James. 1979. "Sample Selection Bias as a Specification Error." *Econometrica*, 47: 153–161.

Kennedy, Peter. 1992. *A Guide to Econometrics*. MIT Press, Cambridge, Mass.

Juhn, Chinhui. 1992. "Decline of Male Labor Force Participation: The Role of Declining Labor Market Opportunities." *Quarterly Journal of Economics*, 107: 79–121.

Liao, Tim Futing. 1989. "A Flexible Approach for the Decomposition of Rate Differences." *Demography*, 26: 717–726.