

# Technical Note

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## Employment in recession and recovery: a demographic flow analysis

DONALD R. WILLIAMS

As in earlier downturns, the impacts of recession during 1981–82 were not evenly distributed among the many demographic groups in the labor force. For example, the rise in the unemployment rate was greatest, in relative terms, for men. The decrease in labor force participation was most pronounced among teenagers, while the labor force participation rate for women actually *increased* during this period of general economic decline.

To what extent were these and other differential impacts of the recession the result of differences in the behavior of the labor force participants? To what extent were they instead the result of differing labor market opportunities? These, of course, are very difficult questions to answer, particularly when dealing with aggregate data. To illustrate, a decrease in labor force participation can be the result of two factors—an *increase* in the rate at which individuals *leave* the labor force, or a *decrease* in the rate at which workers *enter* the labor force. Because these and other types of labor force transitions can have different behavioral interpretations (that is, they may have “different kinds of sources”), it is important to identify which transitions generate demographic differences in labor force participation and unemployment experience. To address these issues, I examine, by age, sex, and race, the monthly flows into and out of the labor force and between employment and unemployment from January 1981 to January 1984, well into the current recovery period.

### Distribution of economic impacts

Race, sex, and age differences in the *levels* of unemployment and labor force participation rates can be seen in table 1. The entries are averages over the period December 1980 to December 1983 of data from Current Population Survey “Gross Change Tabulations,” which give monthly estimates of the numbers of people employed, unemployed, and out of the labor force during the preceding month. The

entries in the table therefore are not based on or equivalent to the unemployment and participation rates published by the Bureau of Labor Statistics.<sup>1</sup>

Inspection of the table indicates, however, that the well-known race, sex, and age differences found in the published estimates are also found here. Blacks and members of other races, on average, have higher unemployment rates than whites, and lower levels of labor force participation, regardless of sex or age. Women have slightly lower unemployment rates than men (a relatively recent phenomenon), and lower labor force participation rates, regardless of age or race. Unemployment rates are seen to decrease with age for all sex/race groups, while labor force participation rates increase and then decrease with age, peaking in the 25- to 59-year-old “prime-age” category. Although the point estimates from the gross change data may differ from the published BLS estimates, the age, race, and sex relationships seem to be the same.

The focus of this study is not on differences in the levels of unemployment and participation, however, but rather on differences in their behavior over the most recent business cycle. The National Bureau of Economic Research has identified the peak of that cycle as July 1981 and the trough as November 1982. The corresponding changes in the unemployment rates during the period for each demographic group are presented in table 2, along with changes since the recovery began, for the November 1982 to December 1983 period. During the downturn, the unemployment rate increased more on average for men than for women, more for whites than for blacks and others, and more for older (over 59) workers than for teenagers (age 16 to 19), youth (20 to 24), or prime-age workers (24 to 59). The greatest increases were felt among older women, who experienced growth in their unemployment rate of more than 158 percent. The sex difference was reversed for nonwhite teens, youth, and older workers, with nonwhite women experiencing greater relative unemployment increases than nonwhite men. The racial difference was reversed for teenagers.

Of course, the lags in the impacts of an economic downturn can vary across demographic groups, so that the “official” definition of the timing of the downturn may not be the appropriate timeframe for this type of analysis. For example, the unemployment rate for black men did not peak until July 1983. To account for this, I computed the per-

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Donald R. Williams is an assistant professor of economics at Kent State University, Kent, Ohio.

**Table 1. Average unemployment and labor force participation rates by sex, race, and age, December 1980–December 1983**

[In percent]

Sex and race	Unemployment rate					Labor force participation rate				
	Total	Teens (16–19)	Youth (20–24)	Prime-age (25–59)	Older (60+)	Total	Teens (16–19)	Youth (20–24)	Prime-age (25–59)	Older (60+)
Total	8.6	21.5	14.1	6.7	4.0	64.0	53.8	76.0	78.1	22.4
White	7.5	18.7	11.6	5.9	3.6	64.4	57.2	78.0	78.5	22.2
Nonwhite	16.3	42.2	28.0	12.0	7.2	62.7	38.4	68.1	76.8	22.9
Males	8.6	22.5	15.2	6.6	4.1	76.9	57.2	84.6	92.7	31.7
White	7.6	19.8	13.1	5.9	3.7	77.6	60.1	85.7	93.5	31.9
Nonwhite	16.7	42.7	28.6	12.2	8.8	71.6	41.9	77.6	87.3	29.6
Females	8.5	20.2	12.3	6.8	3.8	52.7	51.0	68.9	64.6	15.3
White	7.4	17.4	9.9	6.0	3.6	52.3	54.2	70.6	64.1	15.0
Nonwhite	15.9	41.6	27.2	11.8	5.1	55.3	35.1	60.1	68.2	17.9

NOTE: Estimates calculated from Current Population Survey "Gross Change Tabulations."

centage change in the unemployment rate for each demographic group between the month the group's rate was at its minimum and the month it reached its maximum. These estimates are presented in the following tabulation, for the "all ages" and "teens" subgroups:

	All ages	Teens
All workers	60.3	52.7
White	64.7	43.4
Blacks and others	50.3	62.1
Males	79.3	45.3
Whites	84.3	56.0
Blacks and others	59.8	81.2
Females	45.7	41.5
Whites	46.3	37.2
Blacks and others	46.3	57.1

Most of the qualitative conclusions noted above do not change. The relative increases in the unemployment rate were still worse for men than for women and worse for whites than for members of other races (except among teens).

One difference is that, by this measure, teens suffered greater than average unemployment rate increases, while one might conclude the opposite using the measure in table 2.

Referring again to table 2, we see that the pattern in the recovery period differs somewhat from that of the recession. For instance, the effect of the recovery was relatively stronger for women than for men, while the opposite was true of the recession. The racial difference remained the same: the effect of the recovery was felt more, on average, by whites than by nonwhites. The sex difference is primarily due to the fact that the unemployment rate continued to rise for nonwhite men well into the recovery period. Again, these observations are consistent with those based on the published unemployment rates.<sup>2</sup>

Many explanations have been offered for these differences. For example, the effect of the downturn has been said to have been greater for men than for women because the economic decline affected primarily the goods-producing, as opposed to the service-producing, sector.<sup>3</sup> Construc-

**Table 2. Percent change in unemployment and labor force participation rates by sex, race, and age, July 1981–November 1982 and November 1982–December 1983**

Sex and age	July 1981–November 1982					November 1982–December 1983				
	Total	Teens (16–19)	Youth (20–24)	Prime-age (25–59)	Older (60+)	Total	Teens (16–19)	Youth (20–24)	Prime-age (25–59)	Older (60+)
<b>Unemployment rate</b>										
Total	44.7	22.0	27.3	57.6	47.3	-25.0	-21.0	-6.2	-25.4	.4
White	46.7	22.1	31.9	59.0	45.9	-27.6	-22.7	-8.1	-26.3	5.3
Nonwhite	33.5	21.2	19.1	49.2	65.1	-16.2	-16.4	-7.0	-18.1	-30.9
Males	54.0	26.3	29.1	69.6	49.1	-24.5	-17.1	.4	-25.6	3.4
White	55.7	25.6	31.5	71.9	52.4	-24.9	-17.3	-2.2	-26.2	9.7
Nonwhite	40.1	24.6	15.8	52.8	26.4	-22.2	-19.7	6.6	-21.9	-21.0
Females	33.5	22.2	32.1	44.0	52.5	-25.6	-25.7	-19.5	-23.1	-9.8
White	35.2	19.7	32.4	42.7	36.5	-31.2	-28.3	-17.0	-26.5	-1.9
Nonwhite	26.3	26.7	22.6	45.3	158.3	-9.0	-12.7	-19.9	-13.8	-44.6
<b>Labor force participation rate</b>										
Total	.3	-4.1	3.1	1.3	-1.3	.8	-.3	-1.8	1.2	-1.4
White	.1	-3.3	.5	1.3	-2.4	-.1	-1.9	-.1	.4	-1.7
Nonwhite	1.7	-4.6	5.1	1.6	5.4	6.9	5.6	2.2	6.5	.7
Males	-.8	-6.3	.1	.1	-4.3	.3	-1.5	1.0	.3	-1.5
White	-1.1	-5.7	-.1	( <sup>1</sup> )	-5.8	.3	-3.1	1.3	-.1	-1.3
Nonwhite	2.4	-7.5	2.7	2.1	12.5	4.3	9.0	6.3	2.9	-5.0
Females	1.7	-1.3	1.8	2.8	3.9	1.2	.3	-.9	2.2	-1.6
White	1.9	-.8	1.1	3.1	4.4	-.1	-.5	-.7	.8	-2.5
Nonwhite	.8	-1.8	7.1	.9	-.5	9.7	1.6	-3.4	10.5	8.1

<sup>1</sup>Less than -0.1.

tion and auto-related industries, including steel manufacturing, were especially hard hit. In contrast, some service industries actually *increased* employment (although at a decreasing rate) throughout most of the recession. Along the same lines, blue-collar workers suffered worse employment losses than white-collar workers. Because men and women are distributed differently among industries and occupations, with men in the more cyclically sensitive ones, men would be expected to suffer relatively greater increases in their unemployment rates. The fact that the industries and occupations that incurred the greatest losses in demand are also those with traditionally higher than average layoff rates<sup>4</sup> could have further aggravated their employment declines.

The contribution this makes to the sex difference in the employment declines is unclear, however. We know that men have higher layoff rates than women, but that is probably primarily because of the sex difference in the occupational distribution.<sup>5</sup> Any sex differences in the cyclic sensitivity of layoff rates are also probably due to the industrial or occupational distributions. To fully understand the role of layoff rates in explaining the sex differences in the cyclic behavior of unemployment rates, we need to know whether the responsiveness of the layoff rate is less for women than for men in the same industry and occupation. Evidence presented by Norman Bowers suggests that in the three previous recessions the responsiveness of the layoff rate was actually greater for women than for men, both on average and by industry and occupation.<sup>6</sup> Findings by Francine Blau and Lawrence Kahn, however, seem to show that there is little, if any, sex difference in the cyclical component of layoffs after controlling for industry, occupation, and other worker characteristics.<sup>7</sup>

Differences in cyclical variations in layoff rates also fail to explain the racial difference in changes in the unemployment rate. Nonwhites suffered relatively smaller unemployment rate increases than whites during the last recession, yet their layoff rates have historically been *more* cyclically responsive, even after controlling for worker and job characteristics.<sup>8</sup> Instead of layoff rate disparities, the racial difference in the unemployment response is probably due, at least in part, to the fact that members of racial minorities never fully recovered from the 1980 recession. Their unemployment rates were already high when the most recent downturn began, so that the increases it brought about were relatively small.

One other factor that could be important in explaining the differential unemployment rate impacts both by race and by sex is the propensity, as unemployment rates increase (or, put differently, as employment opportunities decline), for labor force participation rates to decrease. If women and nonwhites tend to drop out of the labor force at a greater rate than white males in response to a given change in employment opportunities, then their unemployment rates will not rise by as much as those for white males. The "economic impact" for men and women could therefore be

the same—women could suffer as much as men—but it would not be reflected in the unemployment rate. It is for this reason that many analysts argue that unemployment rates are not appropriate measures of the welfare of a demographic group, and prefer to study the "employment to population ratio" instead.<sup>9</sup> I prefer to examine the problem directly and look at the behavior of both the unemployment and labor force participation rates. In particular, we need to examine the relationships between the two.

Estimates of the percentage changes in (seasonally adjusted) labor force participation rates for the July 1981–November 1982 period and the November 1982–December 1983 period are presented in table 2. As with the cyclic behavior of the unemployment rate, differences exist according to age, race, and sex. Note that the participation rate decreased for men during the economic decline, while it increased for women. The rate rose for whites, but the increase was small relative to the increase for blacks and others. Referring to the previous discussion, we find these results suggest that the unemployment rate measure actually *overstates* the burden of the recession for women and members of racial minorities relative to white men, rather than understating it as had been hypothesized above.

Certainly, these changes may be due to recent trends more than to the business cycle. To correctly interpret changes in the unemployment rate, we need to look at its relationship with participation rates *net* of trend. I do this by examining the coefficient on the unemployment rate variable in the following equation:

$$(1) \log(LFPR)_t = \beta_0 + \beta_1 TIME_t + \beta_2 URATE_{t-1} + \Gamma(\text{seasonal dummies}) + u_t$$

where  $LFPR$  is a given group's labor force participation rate in period  $t$ , and  $URATE_{t-1}$  is the unemployment rate (for that group, for the entire population, or for some reference group, such as prime-age men), lagged one period. Lagging the unemployment rate is one way to eliminate the problems created by the fact that sampling errors in  $URATE$  and  $LFPR$  may be highly correlated at any point in time. Estimates of  $\beta_1$  and  $\beta_2$  are presented in table 3, by age, race, and sex.

**Table 3. Regression coefficients for equation 1, by sex, race, and age**

Sex and race	All workers		Teenagers		Prime-age	
	TIME	URATE	TIME	URATE	TIME	URATE
Total . . . . .	<sup>1</sup> .0003	-.0170	-.0005	-.0857	<sup>2</sup> .0045	-.0030
White . . . . .	.0002	-.0160	.0002	<sup>2</sup> -.1512	<sup>2</sup> .0004	-.0021
Nonwhite . . . . .	<sup>2</sup> .0039	-.0199	.0049	-.1807	<sup>2</sup> .0031	.0356
Males . . . . .	.0002	<sup>2</sup> -.0252	-.0002	<sup>2</sup> -.1180	<sup>2</sup> .0001	<sup>2</sup> -.0070
White . . . . .	-.0002	<sup>1</sup> -.0203	-.0011	<sup>2</sup> -.0970	<sup>2</sup> -.0001	-.0004
Nonwhite . . . . .	<sup>2</sup> -.0033	-.0304	.0690	<sup>1</sup> -.3483	<sup>2</sup> .0017	-.0172
Females . . . . .	<sup>2</sup> .0012	-.0138	<sup>2</sup> .0018	<sup>2</sup> -.1914	<sup>2</sup> .0015	-.0090
White . . . . .	<sup>2</sup> .0006	-.0014	<sup>2</sup> .0012	<sup>2</sup> -.1772	<sup>2</sup> .0010	-.0003
Nonwhite . . . . .	<sup>2</sup> .0044	-.0036	<sup>1</sup> .0043	-.1757	<sup>2</sup> .0041	.0190

<sup>1</sup>Significant at a 90-percent confidence level.

<sup>2</sup>Significant at a 95-percent confidence level.

(The estimates are derived using the Cochrane–Orcutt technique, assuming first-order serial correlation. The unemployment rate variable is here defined as the average unemployment rate for the population as a whole.)

The results indicate that the relationship between the unemployment rate and the labor force participation rate (as measured by the coefficient on *URATE*) did not differ much by race, except for male teenagers. For nonwhite male teens, a 1-percent increase in the unemployment rate (that is, from 10.0 to 10.01) is associated with a .3483-percent decrease in their labor force participation rate. That response is almost four times the response exhibited by whites. For the population as a whole, however, the magnitudes of the responses vary little by race. Some differences do exist by sex, with males exhibiting a strong tendency to decrease their participation as unemployment rates rise. This is true for all groups except white teens. The coefficients on *TIME* indicate that the increases in the participation rates of women during the period (recall the results in table 2) were indeed largely the effect of a trend component rather than a cyclic one. Relating these results back to our interpretation of the “burdens” of the recession, the fact that declines in aggregate demand seem to generate relatively larger decreases in participation for men and teens, and especially minority male teens, suggests that the unemployment rates for those groups may understate the true relative burden of the recession.

Explanations for the differing participation rate responses include the notion that teens and men exhibit greater than average decreases in participation as unemployment rates rise because they suffer greater than average decreases in demand for their labor. A decrease in demand can have two effects: first, assuming some degree of wage rigidity, there is a direct effect on employment, and hence a direct effect on participation—if the number of people employed declines then, other things equal, the participation rate will decline. Second, there is the “discouraged worker effect,” the decline in participation because persons think they will have little success finding a job. An alternative explanation is that demand does not decrease more for teens or men, but rather that, given a change in the demand for their labor, teens and men simply *respond* more. Results from another study have shown that sources of differences in participation responses include differential costs of search, differential wage rates, and differential *levels of* (not *changes in*) labor demand, in addition to differential “preferences” for work.<sup>10</sup>

Possible explanations for the relatively small decreases in participation exhibited by women may therefore include the following: (1) demand for women’s labor does not decline much as unemployment rates rise; (2) women have stronger preferences for work and lower costs of search; or (3) women will enter the labor force as unemployment rates rise to compensate for income lost because of the unemployment of other family members (the “added worker effect”). Evidence of the validity of each of these hy-

potheses is presented later in this study.

In sum, using relative changes in the unemployment rate as a measure of the impact of the recent recession, the evidence indicates that the heaviest burdens were placed on male, white, and prime-aged and older workers. The magnitude of the burdens is open to question, however, if one keeps in mind that changes in labor force participation rates affect measured unemployment rates, and that the participation rate is endogenously determined. Inspection of the relationship between labor force participation rates and aggregate demand suggests that the unemployment rate variable probably *understates* the recession’s relative impact on men and on teens.

### The nature of differential impacts

According to the gross change data, 3,293,000 workers became unemployed during December 1983. Some 1,837,000 entered unemployment from employment, while 1,456,000 entered unemployment from outside the labor force. During the same month, 3,576,000 workers left unemployment—1,745,000 into employment and 1,831,000 into the non-participation state. As this example illustrates, the labor market is in continual motion. The goal of the following discussion is to examine the cyclical variations in unemployment and labor force participation noted earlier in the context of such labor market flows.

Let us denote the number of workers who make a transition from state *I* to state *J* (for example, from employment (*E*) to unemployment (*U*), or from unemployment to non-participation (*N*)) during month *t* as *I<sub>t</sub>J*. Define the probability of making such a transition, given that one is in state *I* in month *t-1*, as  $\lambda_{IJ} = I_t J_t / I_{t-1}$ , where *I<sub>t-1</sub>* is the number of people in state *I* in period *t-1*. It can then be shown that unemployment rates and labor force participation rates can be expressed as explicit functions of the six transition probabilities  $\lambda_{NE}$ ,  $\lambda_{NU}$ ,  $\lambda_{EN}$ ,  $\lambda_{EU}$ ,  $\lambda_{UE}$ , and  $\lambda_{UN}$ .<sup>11</sup> The relationships are such that the unemployment rate increases with increases in  $\lambda_{NU}$  and  $\lambda_{EU}$  and decreases with increases in  $\lambda_{UE}$  and  $\lambda_{UN}$ . The effects of changes in  $\lambda_{NE}$  and  $\lambda_{EN}$  depend on the relative magnitudes of the other transition probabilities. The participation rate will increase with increases in  $\lambda_{NE}$  and  $\lambda_{NU}$ , and decrease with increases in  $\lambda_{EN}$  and  $\lambda_{UN}$ . The effects of  $\lambda_{UE}$  and  $\lambda_{EU}$  depend on the relative magnitudes of  $\lambda_{UN}$  and  $\lambda_{EN}$ . Whatever their size or direction, changes in these transition probabilities are the sources of changes in unemployment and labor force participation rates. We can therefore analyze cyclical changes in unemployment and participation rates in terms of cyclical variations in transition probabilities.

Before proceeding to that analysis, however, it may be useful to examine age, race, and sex differences in levels of transition probabilities. The averages over the December 1981–December 1983 period are presented in table 4 for the population as a whole, and for the teenage and prime-aged groups. Given the race, sex, and age differences in

**Table 4. Probabilities of transition among labor force states, by age, sex, and race, December 1981–December 1983 averages**

Age, sex, and race	Transition					
	N to E	N to U	E to N	E to U	U to E	U to N
<b>All workers</b>						
Total	.0437	.0301	.0301	.0198	.2236	.1897
White	.0445	.0257	.0295	.0183	.2489	.1739
Nonwhite	.0433	.0623	.0362	.0302	.1556	.2397
Males:						
White	.0563	.0352	.0195	.0206	.2561	.1245
Nonwhite	.0540	.0732	.0291	.0352	.1729	.1841
Females:						
White	.0391	.0216	.0428	.0157	.2306	.2430
Nonwhite	.0365	.0550	.0429	.0241	.1323	.3016
<b>Teenagers</b>						
Total	.1016	.0858	.1041	.0484	.2178	.3054
White	.1183	.0827	.0997	.0445	.2498	.2848
Nonwhite	.0582	.1037	.1516	.0808	.1244	.3732
Males:						
White	.1210	.0902	.0961	.0502	.2487	.2648
Nonwhite	.0668	.1102	.1405	.0861	.1245	.3494
Females:						
White	.1032	.0748	.1024	.0395	.2432	.3102
Nonwhite	.0478	.0935	.1609	.0742	.1213	.4072
<b>Prime-age</b>						
Total	.0526	.0355	.1081	.0159	.2230	.1514
White	.0536	.0317	.0177	.0147	.2445	.1450
Nonwhite	.0508	.0674	.0216	.0231	.1205	.1960
Males:						
White	.0763	.0688	.0065	.0165	.2592	.0828
Nonwhite	.0708	.0908	.0141	.0279	.1867	.1232
Females:						
White	.0477	.0249	.0330	.0123	.2144	.2328
Nonwhite	.0442	.0598	.0294	.0181	.1235	.2756

unemployment and participation rates, the differences in transition probabilities are not surprising. Women have lower probabilities of making the transitions from *N*-to-*E* and *N*-to-*U*, and much higher probabilities of moving from *E*-to-*N* and *U*-to-*N*. All of these differences contribute to the lower labor force participation rates for women. Members of racial minorities have much lower rates of transition from *U*-to-*E* than do whites, and slightly higher transition rates from *E*-to-*U*, which contribute to their higher unemployment rates. Racial differences also exist in the *N*-to-*U* and *U*-to-*N* transition rates, with nonwhites more likely to enter unemployment on the one hand, and more likely to leave it on the other. These differences tend to cancel one another out. A significant racial difference also exists for the *N*-to-*E* transition for teenagers, with nonwhites much less likely to make the transition. On average, teenagers are much more volatile than other labor force groups, with higher than average probabilities for the *N*-to-*E*, *N*-to-*U*, *E*-to-*N*, *E*-to-*U*, and *U*-to-*N* transitions. The *U*-to-*E* transition rate does not differ much by age. Prime-aged workers differ from others primarily in their lower *E*-to-*N* and *U*-to-*N* transition probabilities.

The hypothetical relationships between aggregate demand

and each of the transition probabilities are relatively straightforward for some flows and very complex for others, depending on one's model and assumptions. In a fairly general model, all of the effects of a change in demand are indeterminate.<sup>12</sup> A decline in aggregate demand will tend to decrease  $\lambda_{UE}$  and  $\lambda_{NE}$  because the number, frequency, and attractiveness of job offers will decline. A decrease in the frequency of job offers can cause workers' reservation wages to fall, however, which would tend to increase  $\lambda_{UE}$  and  $\lambda_{NE}$ . A decline in aggregate demand can increase the flows from *E*-to-*U* and *E*-to-*N* due to an increase in layoffs and terminations, but it can decrease the same flows if it lowers workers' propensity to quit a job. As aggregate demand falls, we might expect  $\lambda_{UN}$  to increase and  $\lambda_{NU}$  to decrease as a result of declining job offers, but this conclusion depends critically on the relative magnitudes of the levels of changes in job offer rates to people in the *U* and *N* states. In addition,  $\lambda_{UN}$  may decrease and  $\lambda_{NU}$  may increase when aggregate demand falls, as individuals respond to the unemployment of other family members. The actual relationships between aggregate demand and transition probabilities are, at best, empirical issues.

Using the lagged population-average unemployment rate as a measure of aggregate demand, I have explored these relationships by estimating the parameters of the following equation for each transition rate and for the entire population, teens, and the prime-aged group:

$$(2) \log(\lambda_{ij})_t = \beta_0 + \beta_1 \text{TIME}_t + \beta_2 \text{URATE}_{t-1} + \Gamma(\text{seasonal dummies}) + u_t$$

These estimates of  $\beta_1$  and  $\beta_2$  are presented in table 5. The results indicate that some transition probabilities were much more cyclically responsive than others and that the responsiveness varied significantly across demographic groups. First, the *N*-to-*E* transition rate declined with aggregate demand, for the population as a whole and for each of the subgroups except nonwhite teenage females. The decline is especially large for nonwhite males. Nonwhite male teenagers exhibited the strongest response, which would contribute to their stronger participation rate response. (See table 3.) Overall, the *N*-to-*E* transition rate seems more responsive for racial minorities than for whites, and more responsive for men than women. The responsiveness of the *N*-to-*U* transition rate differs primarily by race, not only in magnitude but also in direction. The *N*-to-*U* transition rate tends to increase for whites as aggregate demand falls, but decreases for blacks and others (though the effect is often statistically insignificant). The effect of this difference is to decrease labor force participation among nonwhites and boost it among whites. The *E*-to-*N* transition rate declines as aggregate demand falls, for all age, race, and sex groups. The effect is stronger for nonwhites, with little difference by sex. The *U*-to-*N* transition rate also decreases with aggregate demand for the population on average, although it increases

**Table 5. Regression coefficients for equation 2, by age, sex, and race**

Age, sex, and race	N to E		N to U		E to N		E to U		U to E		U to N	
	TIME	URATE	TIME	URATE	TIME	URATE	TIME	URATE	TIME	URATE	TIME	URATE
<b>All workers</b>												
Total	.0027	<sup>1</sup> -.4319	-.0005	.3642	-.0006	-.2372	<sup>2</sup> -.0061	1.7083	.0019	<sup>1</sup> -.7211	<sup>1</sup> .0024	<sup>1</sup> -.5755
White	.0018	<sup>2</sup> -.3437	-.0028	1.4889	-.0004	-.1580	<sup>1</sup> -.0073	1.7898	<sup>2</sup> .0034	<sup>1</sup> -.8467	<sup>1</sup> .0028	<sup>2</sup> -.5597
Nonwhite	<sup>1</sup> .0175	<sup>1</sup> -1.0818	<sup>1</sup> .0146	-.1346	<sup>2</sup> .0052	-.6477	-.0072	1.7443	<sup>2</sup> -.0036	-.2003	.0020	<sup>1</sup> -.6469
<b>Males:</b>												
White	.0016	<sup>1</sup> -.4465	-.0031	2.4295	.0004	-.1801	-.0047	1.7306	.0028	<sup>1</sup> -.9117	.0014	<sup>1</sup> -.6308
Nonwhite	<sup>1</sup> .0190	<sup>1</sup> -1.3081	<sup>1</sup> .0141	.0978	.0061	<sup>2</sup> -.6826*	-.0069	2.6578	.0004	<sup>1</sup> -.5699	-.0030	<sup>1</sup> -.5828
<b>Females:</b>												
White	.0015	-.2825	-.0028	2.5168	-.0012	-.1516	<sup>1</sup> -.0078	1.6068	<sup>2</sup> .0039	<sup>1</sup> -.7309	<sup>1</sup> .0042	<sup>1</sup> -.4224
Nonwhite	<sup>1</sup> .0163	<sup>2</sup> -.8360	<sup>1</sup> .1518	-.3004	<sup>2</sup> .0051	<sup>1</sup> -.6668	-.0056	1.6620	<sup>1</sup> -.0117	2.4444	.0044	-.5734
<b>Teenagers</b>												
Total	.0032	<sup>1</sup> -.7232	.0011	-.0005	.0031	-.3511	<sup>1</sup> -.0069	1.6651	.0025	<sup>2</sup> -.5565	-.0020	.0233
White	.0039	<sup>1</sup> -.7785	.0011	.0557	.0025	-.3020	<sup>2</sup> -.0067	1.5866	.0038	<sup>2</sup> -.5904	.0001	.1143
Nonwhite	.0106	<sup>2</sup> -.9029	<sup>1</sup> .0123	<sup>1</sup> -.6703	.0114	<sup>1</sup> -1.0923	-.0092	2.10227	-.0032	-.5360	<sup>1</sup> -.0065	-.0954
<b>Males:</b>												
White	.0108	<sup>1</sup> -.6733	.0000	.1672	.0027	-.3491	<sup>1</sup> -.0078	1.5345	-.0002	-.5043	.0020	.0602
Nonwhite	.0150	<sup>1</sup> -1.4732	<sup>1</sup> .0163	-.6510	<sup>2</sup> .0177	<sup>1</sup> -1.5392	-.0060	.5419	-.0053	-.3205	-.0023	-.5546
<b>Females:</b>												
White	<sup>1</sup> .0063	-.9134	.0008	.0884	.0026	-.2763	-.0048	.6528	<sup>2</sup> .0078	-.6402	-.0034	.2985
Nonwhite	.0032	.0618	.0086	<sup>2</sup> -.7404	.0062	-.7382	-.0175	1.5361	-.0001	-.7861	<sup>1</sup> -.0119	<sup>2</sup> .4737
<b>Prime-age</b>												
Total	<sup>1</sup> .0048	<sup>2</sup> -.3302	.0020	2.4652	-.0008	-.0878	-.0022	.4494	.0007	<sup>1</sup> -.7733	-.0029	<sup>1</sup> -.7342
White	<sup>2</sup> .0044	-.2976	-.0038	1.7377	-.0008	.0106	-.2177	.5179	.0013	<sup>1</sup> -.8419	-.0034	-.2514
Nonwhite	<sup>1</sup> .0025	<sup>1</sup> -1.1878	<sup>1</sup> .0203	-.2505	<sup>1</sup> .0058	<sup>1</sup> -.4480	<sup>2</sup> -.0085	2.7098	<sup>1</sup> -.0044	<sup>1</sup> -.3552	-.0006	<sup>1</sup> -.6493
<b>Males:</b>												
White	.4484	-.4801	-.0048	2.5723	.0031	-.0533	.0023	.2912	.0002	<sup>1</sup> -.9130	-.0058	-.4546
Nonwhite	<sup>1</sup> .0257	-.9399	<sup>1</sup> .0155	.3240	.0025	-.1046	-.0098	.7779	.0010	<sup>1</sup> -.9174	<sup>1</sup> -.0089	-.2507
<b>Females:</b>												
White	.0033	-.2047	-.0031	1.7779	-.0027	.0423	<sup>2</sup> -.0067	1.6001	.0027	<sup>1</sup> -.7456	.0046	-.4099
Nonwhite	<sup>1</sup> .0233	<sup>1</sup> -1.1469	<sup>1</sup> .0224	-.5208	<sup>1</sup> .0081	<sup>1</sup> -.6849	-.0047	2.5695	<sup>1</sup> -.0126	.4215	-.0025	<sup>1</sup> -.6798

<sup>1</sup>Significant at the 95-percent confidence level.

<sup>2</sup>Significant at the 90-percent confidence level.

for female teens. Both of these transition rate responses (for E-to-N and U-to-N) are counter to standard views of the effects of declines in aggregate demand. In particular, they tend to increase rather than decrease labor force participation. The strong negative relationship between the unemployment rate and participation rates exhibited by many of the demographic groups therefore is not the result of an increased tendency to drop out of the labor force. Rather, the relationship is the result of a decrease in the tendency to enter the labor force, particularly directly into employment.

The E-to-U and U-to-E transition rates increase and decrease, respectively, as aggregate demand falls. There is little difference in the E-to-U response by race or by sex, except for teens and perhaps prime-age men. Large race and sex differences do exist for the U-to-E transition rate, however, which are probably the primary source of the differential unemployment rate responses noted earlier. As aggregate demand fell during the recession, the U-to-E transition rate declined more for whites than for racial minorities (except prime-age men), and more for males than for females except, again, among teens. These differences may be the result of the disproportionate distribution of the sexes and races across occupations and industries.

All of these differences in the responsiveness of transition probabilities can be related to race, sex, and age differences in the cyclic responsiveness of unemployment and labor force participation rates, and can help identify their sources. The fact that the unemployment rate increased more for men than for women during the recession seems to be the result of the sex differences in the responsiveness of the U-to-E transition probability. This may be interpreted as support for the hypothesis that the demand for labor declined relatively more for men. The fact that the participation rate declined more for men than for women seems to be the result of a tendency for the N-to-E transition rate to decline more for men. This fact could suggest that the differential participation rate response is a labor demand, rather than a labor supply, phenomenon. The added worker effect as an explanation for the sex differences in the participation response does not get much support here, because the N-to-U transition probability does not respond any more for women than it does for men, at least among whites.

The racial difference in the responsiveness of the unemployment rate during the recession is primarily the result of racial differences in the responsiveness of the N-to-U and U-to-E transition probabilities. Both tend to boost unemployment rates more for whites than for nonwhites. The N-

to-*U* difference indicates that the added and discouraged worker effects may be important explanations here, with whites being the added workers and nonwhites the discouraged ones. This could simply be the result of the racial difference in the distribution of single-parent households. However, it could also be an indication that members of racial minorities feel that they are at a considerable labor market disadvantage because of their race. The relatively large decline in the *N*-to-*E* transition rate for nonwhites may very well mean that nonwhites do suffer larger decreases in demand for their labor as aggregate demand declines.

The major age differences in the responsiveness of unemployment and participation rates can also be related to specific transition rates. The unemployment rate of teenagers rose less than average as aggregate demand fell because the *U*-to-*E* transition rate did not decline by as much for teens as for other groups, and because the *U*-to-*N* transition rate increased for teens (except nonwhite males) while decreasing for other groups. The first phenomenon could indicate that reservation wages fell more for teens than for other workers, or that the demand for teenage labor declined less than the demand for others, while the second phenomenon suggests that teens were more likely to become discouraged and quit looking for work.<sup>13</sup> The response of the *U*-to-*N* transition probability also obviously contributes to age differences in the responsiveness of the labor force participation rate. Other factors are the age differences in the responses of the *N*-to-*E* and *N*-to-*U* transition rates, especially for nonwhite males. The large *N*-to-*E* response could indicate that a substantial portion of the participation rate decline for teens is the result of a decrease in the demand for their labor.

The results presented here lend support to many of the hypotheses put forth earlier regarding the sources of demographic differences in unemployment and participation rate behavior. The male/female difference in unemployment rate behavior is indeed probably due to differential changes in demand, which may be attributable to the occupational distribution of the sexes. There is no support, however, for the hypothesis that the participation rate differences arise because women are more likely than men to be "added workers." Differences between the participation responses of whites and nonwhites and between those of teens and other workers appear to be due both to differences in relative responses of the demand for their labor (with the demand for labor decreasing more for racial minorities and teens), and to differences in "supply."

### Suggestions for further research

This analysis of gross change data from the Current Population Survey provides insights into the nature of the differential effects of the recent recession which cannot be obtained from an analysis of unemployment or participation rates alone. Many questions remain unanswered, however. Foremost, of course, is, what exactly causes each of the

differential transition rate responses? If men are discouraged more than women, why? That is a difficult question even with microdata. There are also some questions relating to the methodology, including those related to the timing of the effects of the recession and the appropriate lag structures to use for the *URATE* variable in equations 1 and 2. Further, exactly what is the effect on the unemployment rate of a 1-percent decrease in a given transition rate? Does the effect differ by race or sex? One last question we may want to address is, how do the effects of the 1981-82 recession differ from those of earlier downturns? Have there been structural changes in the relationships between aggregate demand and transition rates which may indicate, for example, that there is less sex or race discrimination in the labor market today, or that there has been a profound and lasting change in women's attitudes toward work outside the home? Many researchers address these issues in other contexts,<sup>14</sup> but a comparison of the results presented here with those from studies of earlier periods could lead to better understanding.

Finally, it should be noted that many cyclical changes in employment status are not between employment, unemployment, and nonparticipation, but rather between full-time and part-time employment.<sup>15</sup> The data used in this study do not distinguish between full- and part-time employment. An analysis of gross flow data that make such a distinction could be very fruitful, as could further study of gross change data broken down by industry of employment. □

#### —FOOTNOTES—

<sup>1</sup> The gross flow data are a byproduct of the Current Population Survey, a monthly survey of approximately 60,000 households conducted by the Bureau of the Census for the Bureau of Labor Statistics.

It should be noted that the gross flow data have not been published since 1952 because of concern about various sources of error. See Ralph E. Smith and Jean E. Vanski, "The Volatility of the Teenage Labor Market: Labor Force Entry, Exit, and Unemployment Flows," in *Youth Unemployment: Its Measurement and Meaning* (U.S. Department of Labor, May 1980); *Gross Flow Data from the Current Population Survey, 1970-1980* (U.S. Department of Labor, March 1982); and John M. Abowd and Arnold Zellner, "Estimating Gross Labor Force Flows," paper presented at the annual meeting of the American Statistical Association, August 1983. However, because the errors should not affect the interpretation of the results of this analysis, the raw gross flow data were used.

<sup>2</sup> See Norman Bowers, "Employment on the rise in the first half of 1983," *Monthly Labor Review*, August 1983, pp. 8-14; and Eugene H. Becker and Norman Bowers, "Employment and unemployment improvements widespread in 1983," *Monthly Labor Review*, February 1984, pp. 3-14.

<sup>3</sup> See Deborah P. Klein, "Trends in employment and unemployment in families," *Monthly Labor Review*, December 1983, pp. 21-25; Joyanna Moy, "Labor market developments in the U.S. and nine other countries," *Monthly Labor Review*, January 1984, pp. 44-51; Becker and Bowers, "Employment and unemployment"; and Larry DeBoer and Michael Seeborg, "The female-male unemployment differential: effects of changes in industry employment," *Monthly Labor Review*, November 1984, pp. 8-15.

<sup>4</sup> See David M. Lilien, "The Cyclical Pattern of Temporary Layoffs in United States Manufacturing," *Review of Economics and Statistics*, February 1980, pp. 24-31; and Francine D. Blau and Lawrence M. Kahn, "Causes and Consequences of Layoffs," *Economic Inquiry*, April 1981, pp. 270-96.

<sup>5</sup>Blau and Kahn, "Causes and Consequences."

<sup>6</sup>Norman Bowers, "Have employment patterns in recessions changed?" *Monthly Labor Review*, February 1981, pp. 15-28.

<sup>7</sup>Blau and Kahn, "Causes and Consequences."

<sup>8</sup>*Ibid.*

<sup>9</sup>See Carol Boyd Leon, "The employment population ratio: its value in labor force analysis," *Monthly Labor Review*, February 1981, pp. 36-45.

<sup>10</sup>Donald R. Williams, "Racial Differences in Male Teenage Labor Force Participation Rates," Ph.D. Diss., Northwestern University, August 1984.

<sup>11</sup>See Stephen Marston, "Employment Instability and High Unemployment Rates," *Brookings Papers on Economic Activity*, vol. 1, 1976, pp. 169-203; and Williams, "Racial Differences."

<sup>12</sup>Williams, "Racial Differences."

<sup>13</sup>For further evidence of age differences in discouragement, see T. Aldrich Finegan, "Discouraged Workers and Economic Fluctuations," *Industrial and Labor Relations Review*, October 1981, pp. 88-102.

<sup>14</sup>See Ralph E. Smith, Jean E. Vanski, and Charles C. Holt, "Recession and the Employment of Demographic Groups," *Brookings Papers on Economic Activity*, vol. 3, 1974, pp. 737-58; Marston, "Employment Instability"; Kim B. Clark and Lawrence H. Summers, "Demographic Differences in Cyclical Employment Variations," *Journal of Human Resources*, Winter 1981, pp. 61-79; and Bowers, "Have employment patterns in recessions changed?"

<sup>15</sup>Robert W. Bednarzik, "Short workweeks during economic downturns," *Monthly Labor Review*, June 1983, pp. 3-11.

*Part-time work  
Labor force  
New data series*

## on involuntary part-time work

HARVEY R. HAMEL

The number of nonagricultural workers "on part-time schedules for economic reasons," shows a strong relationship to business cycle trends, according to seasonally adjusted data from the Current Population Survey.<sup>1</sup> The number and proportion of persons involuntarily working part time—sometimes referred to as the "partially unemployed"—generally rise during a recession and decline during a recovery period. In a comprehensive examination and analysis of these data which appeared in the June 1983 *Monthly Labor Review*,<sup>2</sup> Robert W. Bednarzik demonstrated that during cyclical periods, the incidence of economic part-time work moves in the same direction as, but leads, movements in the civilian unemployment rate. Bednarzik explained that such part-time employment typically rises before unemployment begins to increase during a recession, mainly because employers tend to reduce hours of work when possible before laying off employees. During recovery periods, employers usually restore the hours of those on shortened workweeks before rehiring laid-off workers. The main focus of Bednarzik's analysis, however, was the relationship and variation in cyclical behavior of the two main causes of involuntary part-time work, cutbacks in weekly hours due to slack work and failure to find full-time work,<sup>3</sup> both of

Harvey R. Hamel is a senior economist in the Division of Employment and Unemployment Analysis, Bureau of Labor Statistics.

which were seasonally adjusted specifically for his study.

Following up on Bednarzik's analysis, BLS tested the cyclical sensitivity and accuracy of the new series and confirmed that these data captured more clearly the distinctions between the concepts of persons working part time involuntarily than did the existing published series, which divided the total number into those who "usually work full time" and those who "usually work part time."<sup>4</sup> Thus, to provide data users with more relevant series that can isolate the main causes of part-time work, BLS has replaced the existing usual full- and part-time series with the new series. Effective with data for January 1985, the new series are published in monthly issues of "The Employment Situation" news release and *Employment and Earnings*,<sup>5</sup> and, beginning with this issue, are also published in table 4 in the Current Labor Statistics section of the *Monthly Labor Review*. Data are published for all persons (in agriculture and nonagricultural industries combined) as well as for persons in nonagricultural industries only. (The former series were limited to workers in nonagricultural industries.) Time series based on the new definitions are available back to 1955 and can be obtained from BLS.

The new series clearly show different cyclical behavior, which, in turn, illustrates different underlying labor market problems. The more cyclical "slack work" series reflects short-run adjustments made by firms to minimize layoffs and subsequent recalls or hirings. Thus, slack work rises sharply during economic downturns, but shows rapid improvement during the early stages of recovery. The "failure to find full-time work" series reflect the experience, skills, and training of workers; the match of available workers to work schedules; and the types and locations of job openings, as well as the general state of the economy. The "failure to find" series is clearly less cyclical. Indeed, in contrast to the "slack work" component, it typically rises during the early stages of a recovery, probably because many unemployed workers find and accept part-time jobs (perhaps after exhausting unemployment insurance benefits) as a better alternative to remaining fully unemployed without compensation.

Recent data illustrate this point. The following tabulation shows the number of persons (seasonally adjusted) and the percent of total civilian employment on part-time schedules for economic reasons during September of 1982 and 1983 and January 1985:

	<i>Slack work</i>		<i>Could only find part-time work</i>	
	<i>Number (thousands)</i>	<i>Percent of civilian employment</i>	<i>Number (thousands)</i>	<i>Percent of civilian employment</i>
September 1982 . . . . .	3,718	3.7	2,731	2.7
September 1983 . . . . .	2,696	2.6	3,182	3.1
January 1985 . . . . .	2,431	2.3	2,848	2.7