

Meyer, Bruce D.

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current level of use. The effects of diagnosed substance abuse and dependence may have a much greater impact on children than undiagnosed, or more casual, use. Moreover, children at certain ages, for example, during early childhood, may be more vulnerable to the effects of maternal substance use. Estimating these effects is a direction for future research.

¹ For a review of the literature, see F.J. Chaloupka, M. Grossman, and H. Saffer, "The Effects of Price on the Consequences of Alcohol Use and Abuse," in *Recent Developments in Alcoholism*, Volume 16: *The Consequences of Alcohol*, M. Galanter, ed. New York: Plenum Publishing, 1998.

² L.A. Greenfeld, *Alcohol and Crime: An Analysis of National Data on the Prevalence of Alcohol Involvement in Crime, a report prepared for the Assistant Attorney General's National Symposium on Alcohol Abuse and Crime*, April 1998.

³ S. Markowitz, "An Economic Analysis of

Alcohol, Drugs, and Violent Crime in the National Crime Victimization Survey," NBER Working Paper No. 7982, October 2000.

⁴ S. Markowitz, "Criminal Violence and Alcohol Beverage Control: Evidence from an International Study," NBER Working Paper No. 7481, January 2000, and in *The Economic Analysis of Substance Use and Abuse: The Experience of Developed Countries and Lessons for Developing Countries*, M. Grossman and C.R. Hsieh, eds. Cheltenham, United Kingdom: Edward Elgar Publishing, 2001.

⁵ U.S. Department of Justice, Bureau of Justice Statistics, *Violent Crime*, NCJ-147486; and U.S. Department of Justice, Bureau of Justice Statistics, *Criminal Victimization 1998: Changes 1997-98 with Trends 1993-98*, NCJ-176353.

⁶ M. Grossman and S. Markowitz, "Alcohol Regulation and Violence on College Campuses," NBER Working Paper No. 7129, May 1999, and in *The Economic Analysis of Substance Use and Abuse: The Experience of Developed Countries and Lessons for Developing Countries*.

⁷ S. Markowitz, "The Role of Alcohol and Drug Consumption in Determining

Physical Fights and Weapon Carrying by Teenagers," NBER Working Paper No. 7500, January 2000; forthcoming in *Eastern Economic Journal*.

⁸ S. Markowitz, "The Price of Alcohol, Wife Abuse, and Husband Abuse," NBER Working Paper No. 6916, January 1999, and *Southern Economic Journal*, 67 (October 2000), pp. 279-303.

⁹ S. Markowitz and M. Grossman, "Alcohol Regulation and Violence Towards Children," NBER Working Paper No. 6359, January 1998, and *Contemporary Economic Policy*, 16 (July 1998), pp. 309-20; S. Markowitz and M. Grossman, "The Effects of Alcohol Regulation on Physical Child Abuse," NBER Working Paper No. 6629, July 1998, and *Journal of Health Economics*, 19 (March 2000), pp. 271-82.

¹⁰ P. Chatterji and S. Markowitz, "The Impact of Maternal Alcohol and Illicit Drug Use on Children's Behavior Problems: Evidence from the Children of the National Longitudinal Survey of Youth," NBER Working Paper No. 7692, May 2000; forthcoming in *Journal of Health Economics*.

Taxes, Welfare, and Work by Single Mothers

Bruce D. Meyer*

Between 1984 and 1996, changes in tax and transfer programs sharply increased the incentives for single mothers to work. Two aspects of these policy changes are often overlooked. First, many important policy changes occurred even before the implementation of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA). Second, despite the media's emphasis on welfare cuts, workfare, and time limits, many of the post-1984 policy changes have encouraged work by increasing financial rewards for work-

ing mothers, not by cutting their benefits. These policy changes have included large expansions of the Earned Income Tax Credit (EITC) and Medicaid for families with working mothers, reductions in the implicit tax rates of Aid to Families with Dependent Children (AFDC), and new child-care programs. During this same period, single mothers began to work more; their weekly employment increased by about 6 percentage points and their annual employment increased by nearly 9 percentage points. Other groups—for example, single women without children, married mothers, and black men—did not experience similar gains in employment during this period. In recent work, Dan T. Rosenbaum and

I document the changes in programs and incentives directed toward single mothers, and we examine the effect of these changes on the employment of these women.¹ We show that a large share of the increase in single mothers' work through 1996 can be attributed to the EITC and other tax changes, with smaller shares attributable to cuts in welfare benefits, welfare waivers, training, and child care programs.

The 1984-96 period provides a rich laboratory for studying the effects of tax and welfare programs on the decision to work. The magnitudes of these effects are critical determinants of the gains or losses that result from changes in income redistribution and social insurance

* Meyer is a Research Associate in the NBER's Programs on Labor Studies, Public Economics, and Children. He is also a professor of economics at Northwestern University.

policies. Moreover, the increase in states' discretion under PRWORA and certain political changes have led to welfare reform that both discourages receipt of welfare benefits and diverts potential welfare recipients from traditional programs. These reforms are difficult, if not impossible, to characterize using a few variables. And it is likely that many of the policies examined in this paper will be even more difficult to analyze using post-PRWORA data.²

We study three types of changes in single mothers' rewards for work. First, there were very large increases in the EITC between 1984 and 1996, primarily benefiting working mothers with children. During this period, real dollars received through the EITC increased more than tenfold: in 1984, the average single mother who earned \$10,000 paid about \$300 in income and payroll taxes; by 1996, that same average single mother received a \$2,000 subsidy for working. Most of the shift from taxes to subsidies has been attributable to the EITC. During the same period, the taxes paid by single women without

children rose slightly.

Figure 1 plots the difference in aftertax earnings of single women with two children and those with no children for a range of real pretax earnings in 1984, 1988, 1992, and 1996. We focus on these two types of women because this comparison is used in much of our data analysis. Between 1984 and 1988, single mothers of two whose real annual earnings ranged from \$10,000 to \$20,000 experienced increases of \$500 to \$1,500 in aftertax earnings (relative to single women without children). Yet these EITC expansions were smaller than the 1994-6 expansions, particularly for very low-income women with two or more children. For example, for women who earned \$7,500, the aftertax earnings difference increased only about \$600 between 1984 and 1993; but between 1993 and 1996, their aftertax earnings difference rose more than \$1,500.

We calculate summary measures of the changes in work incentives by combining the changes in taxes and benefits and averaging them over an

(unchanging) earnings distribution of single women. We find that the average annual tax payments by working single mothers fell by \$1,442 between 1984 and 1996, and those of single women with no children rose by \$187. This represents a decrease of \$1,629 in the taxes of single mothers relative to single women without children. Single mothers with two or more children experienced the sharpest decreases in taxes. Their taxes fell \$868 more than the taxes of single mothers with only one child.

The second set of policy changes that we study includes changes in the Medicaid and AFDC programs. Between 1984 and 1994, the number of children receiving Medicaid increased by 77 percent, and the number of covered adults with dependent children increased by 35 percent. These expansions, which affected primarily nonwelfare families whose incomes were near the poverty line, made work more attractive for low-income single mothers. Valued at the average cost of Medicaid coverage for adults (\$1,083) and children (\$1,900) during this period,

Figure 1
Difference in After-Tax Income of Single Women
With and Without Children, Selected Years

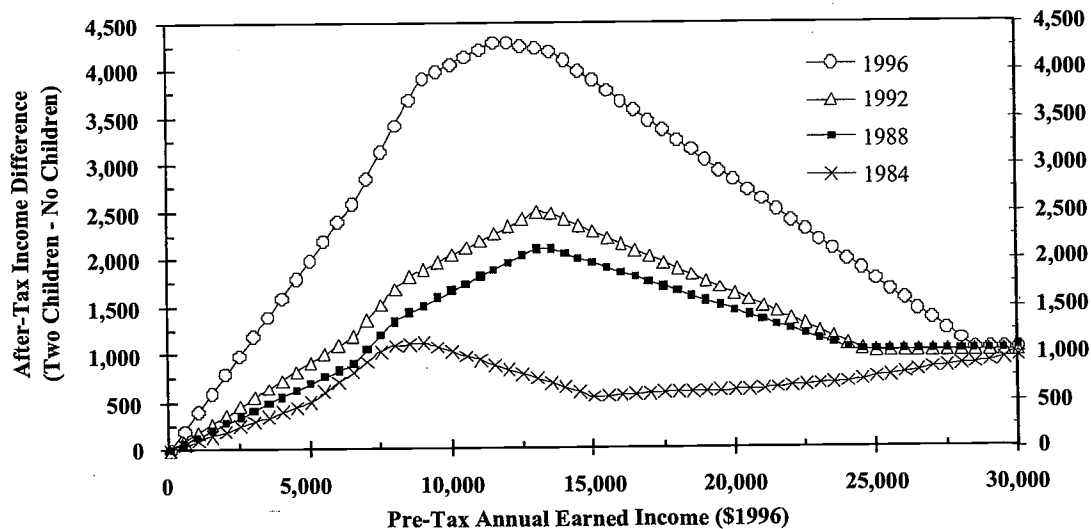


Table 1
Employment Rates, and Differences Between
Single Women With and Without Children, 1984 to 1996

Year	CPS Outgoing Rotation Group, Employed = Worked Last Week				March CPS, Employed = Worked During Year			
	Single Mothers	Single Women w/o Children	Difference	Standard Error	Single Mothers	Single Women w/o Children	Difference	Standard Error
	1984	0.5854	0.8014	-0.2160	0.0059	0.7322	0.9399	-0.2077
1985	0.5861	0.8048	-0.2187	0.0058	0.7302	0.9439	-0.2137	0.0083
1986	0.5891	0.8131	-0.2240	0.0057	0.7310	0.9450	-0.2141	0.0082
1987	0.5941	0.8179	-0.2238	0.0056	0.7382	0.9473	-0.2091	0.0081
1988	0.6027	0.8215	-0.2188	0.0058	0.7482	0.9485	-0.2003	0.0084
1989	0.6136	0.8150	-0.2015	0.0058	0.7577	0.9409	-0.1831	0.0080
1990	0.6007	0.8155	-0.2148	0.0056	0.7591	0.9424	-0.1832	0.0079
1991	0.5790	0.8031	-0.2242	0.0056	0.7428	0.9418	-0.1990	0.0079
1992	0.5790	0.7957	-0.2167	0.0057	0.7387	0.9299	-0.1913	0.0081
1993	0.5875	0.7918	-0.2044	0.0057	0.7511	0.9356	-0.1845	0.0080
1994	0.6053	0.7921	-0.1868	0.0057	0.7907	0.9312	-0.1405	0.0078
1995	0.6265	0.7971	-0.1707	0.0058	0.8072	0.9340	-0.1268	0.0080
1996	0.6450	0.7958	-0.1488	0.0060	0.8191	0.9290	-0.1098	0.0079
1996-1984	0.0596	-0.0075	0.0671	0.0084	0.0870	-0.0109	0.0979	0.0114

Sources: The data are from the 1984-1996 Current Population Survey Outgoing Rotation Group File (ORG) and the 1968-1997 March Current Population Survey (March CPS).

Restrictions: Both samples include 19-44 year-old single women who are not in school.

the changes in Medicaid eligibility increased single mothers' relative incentives to work by about \$752 between 1984 and 1996.

During the same period, welfare benefits for those not working were cut, but benefits changed little, or even increased, for those who were balancing work and welfare. Between 1984 and 1996, welfare benefits (from AFDC and the Food Stamp Program) for working single mothers rose \$582 relative to the benefits of nonworking single mothers. In other words, the increased

incentive to work because of tax changes was about three times as large as the incentive based on changes in welfare benefits. In the 1990s, nearly every state experimented with changes in its welfare programs, often under waivers of the existing program rules. Many of these changes imposed work requirements, time limits, or other measures aimed at encouraging single mothers to work.

The third set of policy changes that we study includes the impact of recent increases in funding for child care and

in job training for single mothers. Between 1988 and 1990, four major new government child-care programs were added for those on welfare and other low-income women. Expenditures for job training programs increased sharply in the early 1990s, and the programs emphasized education and basic skills. The combined effect of these program changes was to significantly alter the incentives for single mothers to enter the workforce. The average child-care benefits for those with young children increased by about \$294.

Together, the changes in taxes, welfare, Medicaid, and child care increased the financial reward for working by a total of \$3,258 from 1984-96. This change equaled almost 18 percent of the average annual pre-tax and transfer earnings of working single mothers, or \$18,165. The \$3,258 represents nearly a 44 percent increase over the average financial gain from working in 1984 of \$7,469. Overall, the policy changes between 1984 and 1996, especially the tax changes, dramatically increased the incentive for single mothers to work.³

When we began this project, we did not know how large the increases in the employment of single mothers concurrent with these policy changes

Figure 2
Weekly Employment Estimates, Controlling for Individual
Characteristics and Macroeconomic Conditions

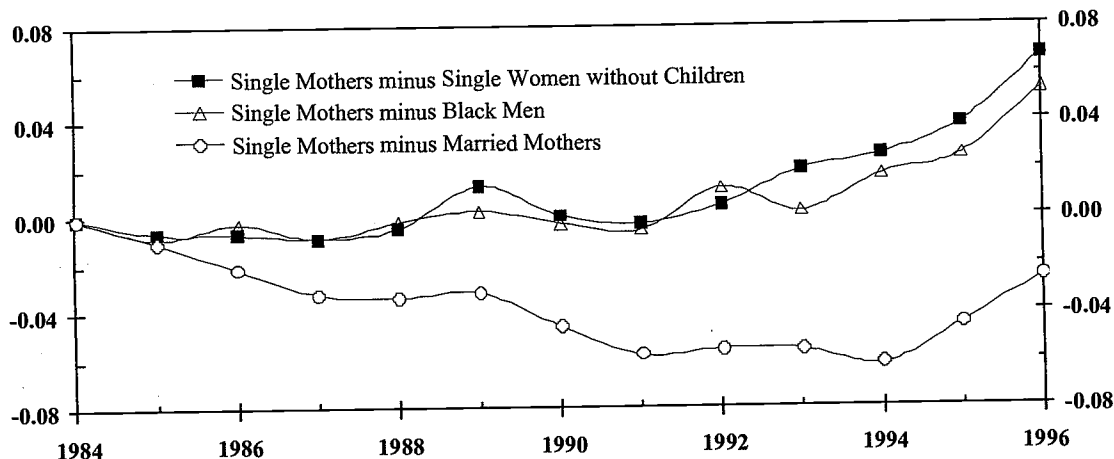
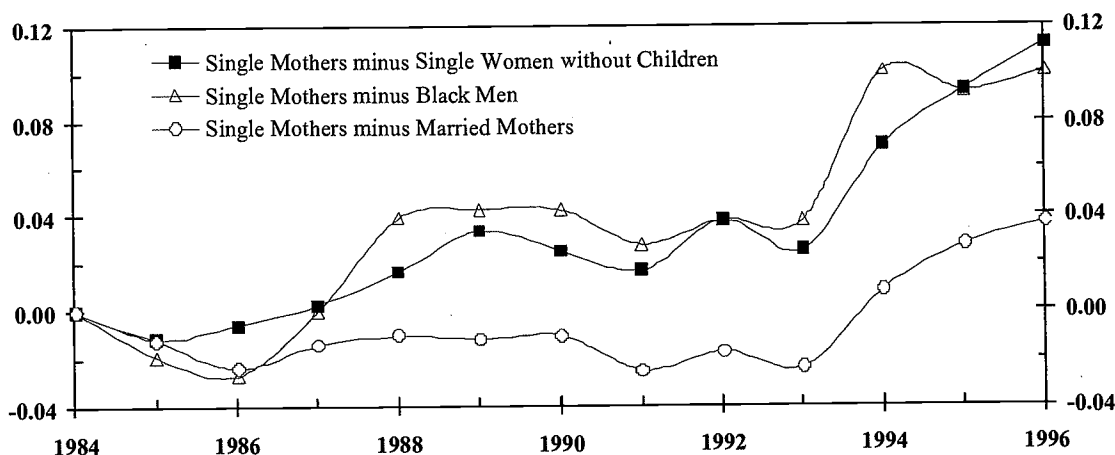


Figure 3
Annual Employment Estimates, Controlling for Individual Characteristics and Macroeconomic Conditions



Sources : The data are from the 1984-1996 CPS Outgoing Rotation Group File (ORG) and the 1985-1997 March Current Population Survey (March CPS).

Restrictions : Both samples include 19-44 year-old persons who are not in school.

were. As Table 1 shows, between 1984 and 1996, the fraction of single mothers working in an average week increased from 0.58 to 0.64, and the fraction working at any time during the year rose from 0.73 to 0.82. During the same period, both weekly and annual employment for a plausible comparison group—single women without children—decreased by about 1 percentage point. Comparisons with married women and black men indicate that the increase in the employment of single mothers represents a break from historic patterns. These patterns are little changed when we account for a wide range of demographic and business cycle characteristics. To illustrate this result, Figures 2 and 3 display the difference in employment rates of single mothers and single women without children for the years 1984–96, after accounting for these demographic and business cycle characteristics. Figure 2 reports changes in weekly employment since 1984, and Figure 3 shows the annual pattern for employment. Both show a relative increase in the employment of single mothers that accelerated after 1991.

In the main part of our work, we construct measures of the work incentives facing single women for each of the years between 1984 and 1996 and in all 50 states and the District of Columbia. The variables we use in the empirical analysis incorporate federal and state income taxes and EITCs, AFDC and Food Stamp benefits, Medicaid coverage, and welfare waivers that led to time limits, work requirements, or disqualification of recipients. We also examine the effects of changes in child care and training programs during this period. Because of the complicated structure of and interactions between these programs, a substantial part of our project characterizes the incentives and program details for women in different states, in different months, and with a range of family sizes and children of various ages.

Our main research strategy identifies the effects of these policies on the work choice of single mothers. The richness of the policy changes that we observe allows us to focus also on narrower sources of variation among women, including differences in the number and ages of children, as well

as differences among states—their taxes, benefits, and living costs. These sources of differences across individuals are not likely to be related to underlying differences in desire to work, and thus may be good levers for determining what influences work decisions.

Our main estimates suggest that the EITC and other tax changes account for more than 60 percent of the 1984–96 increase in the weekly and annual employment of single mothers (relative to single women without children). Welfare waivers and other changes in AFDC account for smaller—but still large—shares of the increase for both employment measures. Changes in Medicaid, training, and child care programs play a still smaller role. The effects of changes in taxes and the EITC are also fairly similar across time periods and specifications. We find that the various policy changes have larger effects on less educated women, and smaller—but still substantial—effects on single mothers with different size families. Some of these research approaches suggest that AFDC produces much weaker effects. The effects on employ-

ment that we find for other policies do not vary much by approach. Furthermore, we find that the effects of the policies on total hours worked are very similar to the results for employment as a whole.

Our detailed examination of the policy changes between 1984 and 1996 uses two large microdata sets. Our results indicate that changes in EITC and other taxes played a dominant role in the employment increases of single mothers between 1984 and 1996. This suggests that policies that "make work pay" are effective in increasing work by single mothers. This lesson is important in that it shows that work can be encouraged by making employment more attractive through tax incentives as well as

by making welfare less attractive through measures such as time limits and work requirements.

¹ B. D. Meyer and D. T. Rosenbaum, "Welfare, the Earned Income Tax Credit, and the Labor Supply of Single Mothers," *NBER Working Paper No. 7363*, September 1999, and *Quarterly Journal of Economics*, 116 (August 2001), pp. 1063–114; and B. D. Meyer and D. T. Rosenbaum, "Making Single Mothers Work: Recent Tax and Welfare Policy and Its Effects," *NBER Working Paper No. 7491*, January 2000, and *National Tax Journal* 53, (December 2000), pp. 1027–62, and in *Making Work Pay: The Earned Income Tax Credit and Its Impact on American Families*, B. D. Meyer and D. Holtz-Eakin, eds., forthcoming from Russell Sage Foundation Press.

² For related arguments see D. T. Ellwood,

"The Impact of the Earned Income Tax Credit and Social Policy Reforms on Work, Marriage, and Living Arrangements," *National Tax Journal*, 53:4 Pt.2 (December 2000), pp. 1063–106; *National Research Council*, *Evaluating Welfare Reform: A Framework and Review of Current Work*, R. Moffitt and M. Ver Ploeg, eds. Washington, DC: National Academy Press, 1999; and C. Jencks and J. Swingle, "Without a Net," *The American Prospect*, 11 (January 3, 2000).

³ Wage changes over this period are unlikely to provide an alternative explanation for the changes in employment of single women without children relative to single mothers. When we account for changes in the observed characteristics of single mothers and single women without children in a log wage regression, the changes in hourly wages over time are similar for the two groups of single women.

Medical Care and Economywide Price Indexes

Joseph P. Newhouse*

It is well known that price indexes for service industries are subject to considerable error. However, errors in medical care price indexes are particularly significant because of that sector's share of the economy. Although the United States is an outlier with more than 13 percent of its GDP devoted to medical care in recent years, the share for other developed countries—typically between 7 and 11 percent—generally has been rising. The accuracy—or inaccuracy—of medical care price indexes has become sufficiently important that Alan Greenspan has taken note of it publicly.¹

A group of NBER researchers have been working for several years both to quantify biases and to suggest technical improvements to medical care

price indexes.² In a recent paper, I attempt to synthesize our results with those of other investigators and to put the work in a larger context.³

I make two principal points: First, although it is difficult to be precise about the amount of bias in the medical care price index, a number of studies have quantified the effects of its various problems. The results suggest that the bias may be large enough to have a nontrivial effect on the overall index. On the basis of some of the early studies, the Boskin Commission estimates that the medical care component of the consumer price index (CPI) was biased upward by 3 percentage points annually.⁴ Second, the amount of bias may change from year to year. This possibility has important implications for monetary policy.

Some Causes of Bias in the Indexes

There are many reasons why the official medical care indexes may

overstate the change in a cost-of-living index. Fortunately, some of the historical reasons have been corrected. For example, the CPI has measured the price of a hospital stay rather than the price of a hospital day since 1997. Between 1980 and 1995, the average length of a patient's stay fell 27 percent. Ignoring any effect on outcomes, this change clearly reduced the cost of treatment. Nevertheless, that reduction in cost was not proportional to the reduction in length of stay because marginal cost falls throughout a stay and care outside the hospital is frequently substituted for the marginal day. Before 1997, the CPI did not register the decrease in cost that resulted from shorter stays because it was pricing the cost of a day in the hospital. Indeed, pricing the cost of a day probably sent a perverse signal: because marginal costs rose as stays shortened, the average cost of a day rose with the fall in length of stay. (When the producer price index for hospitals was intro-

* Newhouse is an NBER Research Associate in the Program on Health Care and the John D. MacArthur Professor of Health Policy and Management at the Harvard Medical School. His "Profile" appears later in this issue.