Displacement and Wage Effects of Welfare Reform

Timothy J. Bartik
Senior Economist
W.E. Upjohn Institute for
Employment Research
300 S. Westnedge Avenue
Kalamazoo, MI 49008

January 1999

I appreciate extensive comments on the manuscript by Larry Katz, my discussant at the November 1998 conference. I also appreciate extensive written comments by Rebecca Blank and David Card on the November 1998 draft of this paper. I also benefitted from comments on previous versions of a portion of this manuscript from Rebecca Blank and Phillip Levine, and on the entire manuscript by Kevin Hollenbeck. I also appreciate helpful comments during the pre-conference from all the attendees, but in particular David Card. I also received good comments from attendees at seminars at the University of Michigan and Western Michigan University. I appreciate help with data from Daniel McMurrer and Phillip Levine. I appreciate research assistance with this manuscript from Ken Kline and Wei-Jang Huang, library support from Linda Richer, help with graphics from Ken Kline, Leslie Lance, and Claire Black, and secretarial support from Claire Black. The research for this paper was conducted in part with financial assistance from the Joint Center for Poverty Research, the Russell Sage Foundation, the Rockefeller Foundation, and the W.E. Upjohn Institute for Employment Research. The findings and opinions of this paper are those of the author, and do not necessarily represent the views of any of the sponsors of the research, or of any of the persons mentioned above.

> "What we have is a limited number of chairs, and there are a lot of potential workers circling these chairs, waiting for someone to get up." Gary Burtless, Brookings Institution.
>
> "Of course, sometimes individual workers get jobs that otherwise might have gone to someone else, but the economy expands as they go to work and other firms hire more people. There is every reason to believe that helping welfare recipients get back to work raises the total number of jobs." Lawrence Summers, Deputy Secretary of the Treasury.[1]

1. INTRODUCTION

In this paper, I consider the displacement and wage effects of welfare reform. Recent welfare reforms are pushing welfare recipients into the labor market. Will jobs obtained by ex-welfare recipients come at the expense of others, who will be "displaced" by losing jobs or having fewer job vacancies available? Will the increased labor supply of welfare recipients stimulate job creation? Will the increased labor supply of welfare recipients depress wages overall, or for women with little education? To address these questions, in this paper I will

- provide estimates of how welfare reform will affect labor supply;
- discuss the forces influencing displacement and wage effects of welfare reform;
- review previous estimates of wage effects that will occur because of welfare reform;
- provide new simulations, using several methodologies and estimates, of the displacement and wage effects that will occur because of welfare reform.
- explore what we can see so far about the labor market effects of welfare reform.

This paper arbitrarily focuses on the labor market effects of welfare reform since 1993. This was the year that welfare caseloads began to level off before rapidly declining. In addition, 1993 was the year that President Clinton was inaugurated, with a commitment to "end welfare as we know it." Congress and Administration policymakers began discussing more radical welfare

[1] Both quotations come from the *New York Times*, April 1, 1997, "Welfare Recipients Taking Jobs Often Held by the Working Poor," by Louis Uchitelle, p. A-1.

reforms that would simply push welfare recipients into the labor force, with less focus on training welfare recipients. President Clinton's endorsement of such welfare reforms took place first by granting state governments waivers from federal welfare regulations,[2] and then by signing the Personal Responsibility and Work Opportunity Reconciliation Act in August 1996.

This paper also assumes that current welfare reforms can be described as simply pushing low-education women into the labor force. The paper assumes that in the present political climate, other types of welfare reforms are unlikely to be pursued on a large scale. Other welfare reforms include helping welfare recipients increase their education, or providing welfare recipients a public service job. These other welfare reforms would have different labor market effects than pushing welfare recipients into the labor force.[3]

This paper's estimates suggest that welfare reform is unlikely to have large effects on national wages or unemployment. But welfare reform is likely to significantly reduce earnings of less-educated women, either through reducing wages or increasing unemployment rates.

2. LABOR SUPPLY EFFECTS OF WELFARE REFORM

Recent federal welfare policies increase the labor supply of welfare recipients in two ways: by pushing states to increase the work of welfare recipients; and by encouraging or allowing states to reduce welfare caseloads, which forces many persons who are unable to receive welfare into

[2]Although both Presidents Reagan and Bush had granted states waivers for various welfare reforms, President Clinton began approving more radical waivers, and approved waivers that covered a larger percentage of the national caseload.

[3]For example, see the paper in this volume by Ellwood and Welty that discusses the labor market effects of public service employment coupled with mandatory work requirements for welfare recipients.

the labor force. States are encouraged to cut caseloads and increase welfare recipients' work by several provisions of the 1996 welfare reform bill, including:

- financial penalties on states that fail to increase work of welfare recipients or cut caseloads;
- a five-year time limit on receipt of federal welfare assistance by individual recipients;
- the fixed federal block grants to states under the 1996 bill means that states pay the full cost of extra welfare spending, which gives states a financial incentive to reduce caseloads.[4]

In addition, both the 1996 welfare bill and previous welfare waivers give states great flexibility in welfare administration. The political mood in most states supports using this flexibility to reduce caseloads and increase work by welfare recipients.

States can take many actions to cut welfare rolls and increase the labor supply of welfare recipients. State policies have included more stringent time limits or work requirements than the federal law, cutting welfare benefits for welfare recipients who are not working, allowing welfare recipients to keep more of their welfare benefits if they work, and providing "welfare to work" services such as short-term training, counseling, and job placement. States also are using administrative procedures to reduce welfare rolls. States are "diverting" applicants for welfare assistance away from welfare, through such means as requiring applicants to search for jobs before considering their application, or providing applicants an "emergency" check if they agree not to apply for welfare assistance for some period (Vobejda and Havemann, August 12, 1998). States are also more frequently "sanctioning" welfare recipients–cutting their benefits in part or in whole–for failure to meet various rules, most commonly for missing appointments with

[4]Previously federal welfare assistance to states was provided on a matching basis to states, which meant that the federal government paid a substantial share of any extra welfare costs incurred by a state.

caseworkers (Vobejda and Havemann, March 23, 1998, U.S. Department of Health and Human Services, August 1998). According to the U.S. DHHS, sanctions have risen 30 percent nationally since 1994, and many states sanction more than 25 percent of their caseload. (U.S. DHHS, August 1998).

Welfare reform's effects on labor supply can be seen in aggregate data. Figure 1 shows U.S. trends in welfare rolls, and in labor force participation for two groups: female household heads with other relatives in the household, between the ages of 16 and 44, and less than a college education; and other women with less than a college education. About 29 percent of the female head group receives welfare, compared with only 2 percent of the group of other less educated women.[5] As the figure shows, the decline in welfare rolls since 1994 has been accompanied by an increase in labor force participation rates of female heads. These trends in welfare and the female head labor force are unlikely to be due to the economy, as similar trends did not occur during past economic recoveries, for example, the recovery from the 1981-82 recession. The most plausible explanation is that the welfare waivers granted to states from 1993-96, followed by the welfare reform bill in 1996, have led to states pushing women off welfare and into the labor force.

Several studies have estimated the effects of recent welfare reform on welfare rolls, or on labor force participation. Other studies have predicted the future effects of welfare reform on welfare rolls and the labor force. Table 1 provides a brief summary of these studies.[6]

---

[5]These figures are derived from the March 1997 Current Population Survey. The percentages reporting AFDC receipt in the CPS are blown up by 1.33, based on Blank's(1997) estimates that AFDC caseloads in the CPS are only 75 percent of the true AFDC caseload.

[6]A more extensive review of these studies in provided in my working paper, "The Labor Supply Effects of Welfare Reform" (July 1998), available on the Upjohn Institute's web site at www.upjohninst.org.

The studies in Table 1 use various methodologies, focus on different aspects of welfare reform, and cover different years. Some studies focus on how welfare waivers affected welfare rolls before 1996 (Levine and Whitmore, 1997; Blank, 1997). One study estimates the relative effects of welfare policies and the Earned Income Tax Credit on the employment of single mothers during 1993-96 (Meyer and Rosenbaum, 1998). Another study extends such analysis to the 1996-98 period (Bishop, 1998). Several studies compare the labor force participation of a group with a high welfare receipt rate to a group with a low welfare receipt rate (Daly, 1997; Bartik, study 6 and study 7, available in Bartik, 1998). Several studies estimate the future effects of welfare reform on welfare rolls and/or labor supply, due to federal work requirements (McMurrer, Sawhill, and Lerman, 1997a, 1997b), the switch from matching to block grants (Chernick and Reschovsky, 1996), and time limits (Duncan, Harris, and Boisjoly, 1998). The last study in the table is the forecast used in this paper. This forecast is discussed further below.

An important issue in many estimates in Table 1 is how reducing welfare rolls affects labor force participation. To derive the estimates in Table 1, I assume that removing (or never starting) one single-parent case from the welfare rolls increases the number of labor force participants by .47, and removing a two-parent case increases labor force participants by .38. These numbers are derived by assuming that cases removed from the rolls, or not started because of welfare reform, have a labor force participation rate of .60; the data suggest that the employment rate while on welfare of single parent cases is .13, and of two-parent cases is .22 (McMurrer et al, 1997b).[7]

[7]Edin and Lein's (1997) book suggests that official figures understate the work of welfare recipients, because many welfare mothers engage in unreported or underground work. However, their research also shows that unreported and underground work is usually only a few hours per week. Low-income working mothers also engage in unreported and underground work, and do so almost as much as welfare mothers. Hence, underground and unreported work does not much alter the labor supply effects of welfare reform. See Bartik (July, 1998) for more discussion.

How reasonable are these assumptions about the labor force effects of reducing welfare rolls? Surveys in several states suggest that those leaving welfare "voluntarily" have an employment rate of 50-60 percent, while those leaving welfare due to sanctions have an employment rate of 40-50 percent (Tweedie and Reichert, 1998).[8] The surveys do not report labor force participation, so we need assumptions about unemployment to estimate labor force participation.[9] According to the March Current Population Survey, unemployment rates during March of female household heads who received welfare the previous year have averaged 37 percent from 1992 to 1997.[10] Unemployment rates of that magnitude, combined with employment rates of 40-60 percent, imply labor force participation rates of more than 60 percent, for example a labor force participation rate of 63 percent if employment rates are 40 percent.[11] State surveys cannot report employment rates of those who never entered welfare due to welfare reform, but this group might have higher labor force participation than those who entered welfare but were later forced off. On the other hand, state surveys may not accurately predict the labor force

[8]Most surveys reviewed by Tweedie and Reichert ask about employment as of the survey, rather than employment at any time after leaving welfare.

[9]Danziger and Kossoudji's (1995) study did ask about labor force participation rates of former general assistance recipients in Michigan. As of two years after the abolition of general assistance, 39 percent of non-disabled younger (40 years old or less) former recipients reported being employed, and 43 percent reported being unemployed, for an unemployment rate of over 50 percent.

[10]The group examined is female heads, with relatives in the household, less than a college degree, ages 16-44, who received AFDC last year. Unemployment rates, using sample weights, for each year from 1992 to 1997 are: 41 percent, 36 percent, 40 percent, 39 percent, 35 percent, and 33 percent. Each year's estimate uses about 400 observations.

[11]The 63 percent labor force participation rate is derived by dividing the employment rate of 40 percent by one minus the unemployment proportion of .37. One could use the same unemployment rate to calculate labor force participation for welfare recipients. If the employment rate of single-parent cases is .13, and their unemployment rate is .37, then their labor force participation rate would be .21. The change in labor force participation rates for single-parent cases would be .42, close to the .47 assumed in this paper. However, unemployment rates for those still on welfare would be lower than those excluded from welfare, as welfare reduces the incentive for job search. Labor force participation rates of current welfare recipients would be lower than .21, and the change in labor force participation rates would be greater than .42.

participation of those forced off welfare in the future, when states may be dealing with "hard core" welfare recipients, who will have lower labor force participation rates if forced off welfare.

Another approach to estimating the labor force effects of reducing welfare rolls is to look at research on how welfare affects work. Danziger, Haveman, and Plotnick's (1981) well-known review article gives a "midpoint" estimate that abolishing welfare would increase annual work hours per welfare recipient by 600 hours. Assuming that when employed, most persons work around 35-40 hours per week, this is equivalent to increasing the average employment rate at any point in time by about .30 (=600 hours divided by "full-time full-year" work hours of around 2000 hours). Unemployment of 37 percent yields an increase in labor force participation of .48, close to the .47 increase for single parent cases assumed in this paper.

Based on this discussion, the assumptions in this paper about the labor force participation effects of reducing welfare rolls appear reasonable. One can come up with reasons why the assumed participation effects might be a bit high or low, but they appear unlikely to be grossly in error.

Despite the different methodologies of the studies in Table 1, the estimated effects on labor supply are consistent. Welfare reforms before 1996 increased the labor force by 100,000 to 300,000 persons. Reforms from 1996-98 increased the labor force by an additional 500,000 to 600,000 persons. In the 10 years after 1998, welfare reforms will add at least another half-million participants to the labor force. From 1993-2008, welfare reform will likely increase the labor force by between one million and two million persons.

Table 2 gives more detail on this paper's "best forecast" for the effects of welfare reform on the labor force. These numbers are used in the paper to simulate the labor market effects of

welfare reform. This forecast assumes that welfare reform accounts for changes in welfare rolls that cannot be explained by unemployment and population trends from 1993-98. The trends in the "unexplained" welfare caseload from 1996-98 are projected forward, under the assumption that negative effects will eventually increase by twice as much as they did from 1996-98, as states adapt to the 1996 bill. The reductions in the welfare rolls are extensive enough in this best forecast that the work requirements in the 1996 welfare bill have little effect, because most states can meet these work requirements by caseload reductions.[12] However, I assume that due to the prevailing political mood, states will gradually increase the proportion of their caseload working to a level between the current level and the nominal requirements in the welfare bill.[13] The federal time limits are assumed to not be binding; I assume that state reductions in caseloads due to sanctions will remove so many long-term recipients from welfare that less than 20 percent of the caseload will have been on welfare more than five years, and states are allowed to exempt 20 percent of their caseload from the time limits. Anecdotes and surveys suggest that those sanctioned and dropped from welfare may disproportionately have lower education levels or greater family problems (Vobejda and Havemann, March 23, 1998; Michigan Family Independence Agency, 1998). Without sanctions, these same cases would be most likely to reach the five-year time limit (Duncan et al, 1998).

[12]Under the welfare bill, the percentage reduction in a state's caseload since 1995 reduces the work requirement percentage by the same amount, unless the federal government can show that the caseload reduction was due to the state changing welfare eligibility rules. Because the federal government bears the burden of proof, it is likely that most reductions in caseloads due to state administrative procedures and other policies are likely to help states meet work requirements.

[13]In addition, the 1996 bill provides for bonus grants for states that are "succeeding" at welfare reform, which provides a financial incentive for states to increase work by welfare recipients.

Finally, the best forecast assumes a recession beginning in 2001 and a recovery beginning by 2004. Because of the recession and recovery, welfare reform's effects on the labor force peak in 2005, and then decline slightly. The rise in unemployment has lagged effects on welfare rolls, which then peak in 2004-2005. The forecast assumes that welfare reform policies have *percentage* effects on welfare caseloads, so welfare reform's effects on caseloads are greatest when caseloads would otherwise be high.[14] This assumption seems reasonable, because states during a recession will face financial problems that force them to restrict welfare spending. In addition, many welfare reform administrative practices, such as sanctioning and diversion, would have effects proportional to the size of the caseload.

For comparison to this best forecast, the notes to Table 2 summarize the labor supply effects of alternative forecasts. These alternative forecasts suggest that the effects of welfare reform on labor supply are not grossly sensitive to different assumptions. The "best forecast" that welfare reform's post 1993 impact on labor supply will peak at 1.4 million in 2005 seems reasonable.

This long-run welfare reform increment to labor supply of 1.4 million over the 1993-2005 period is about one percent of 1993 employment. Such an increase does not seem that large, and, as we will discuss in the next section, seems unlikely to have large effects on average wages and unemployment for the nation. However, the labor supply shock from welfare reform is much larger as a percentage of the labor force or employment of some demographic groups. For

[14]This is implicitly assumed because welfare reform is assumed to account for the unexplained change in the *log* of the welfare receipt rate.

example, the long-run increase in labor supply of less-educated women in my "best forecast" is about three percent of total U.S. employment of women with less than a college education.[15]

The labor supply shock from welfare reform also is larger in states or cities with larger welfare caseloads. Table 3 compares the labor supply shock from welfare reform with overall employment, and the employment of less-educated women, in all the states and in the ten largest metropolitan areas.

As the table shows, welfare reform has larger labor supply effects in states such as California, New York, Michigan, Mississippi, and West Virginia–states with concentrations of urban or rural poverty and therefore higher welfare caseloads. Among the ten largest MSAs, welfare reform is expected to have particularly large labor supply effects in Los Angeles, New York, Philadelphia, and Detroit, metropolitan areas with considerable problems with poverty and economic development. Welfare reform is expected to have smaller labor supply effects in states such as Nebraska, Nevada, New Hampshire, Idaho, South Dakota, and North Dakota–conservative rural states with enough economic prosperity to have modest welfare caseloads.

[15]Using the "best forecast," I assume that labor supply effects on single parents are effects on women, and effects on two parent households are effects on men. The estimated labor supply increase from 1993-2005 for women is 1.268 million. I compare this forecast with employment numbers for women with less than a college education because the March 1997 CPS shows that 98.5 percent of women receiving AFDC have less than a college education.

3. THEORIES OF LABOR MARKET EFFECTS OF WELFARE REFORM

If welfare reform increases the labor force by 1.4 million persons, about 1 percent of the U.S. labor force, will this have large effects on wages and unemployment rates? The answer depends on the model and parameter estimates. For example, as we will see, Mishel and Schmitt (1995) estimate that a labor supply shock of less than one million participants from welfare reform will lower the wages of the bottom 30 percent of the workforce by 12 percent, whereas George Johnson (1998) estimates that a labor supply shock of 10 million from immigration will not affect the wages of any group of native workers by more than 5 percent. The difference between these two estimates largely depends on different estimates of how responsive labor demand is to wages. This section of this paper focuses on these modeling and estimation issues.

Models of Wage and Displacement Effects

Figure 2 illustrates a standard economic model of how an increase in labor supply will affect wages and employment. The labor market shown could be the aggregate labor market, or the market for some type of labor. As shown in the figure, the labor supply increase leads to some decline in wages. In addition, the total increase in employment is less than the labor supply increase. This implies that some original labor force participants are no longer employed because of the shock–that is, they are displaced from employment by the labor supply shock.

Examining the figure shows that the size of these wage and displacement effects depends on the slopes of the labor supply and demand curves. This can be formally expressed by the following equations, which show the effects of the supply shock on the wages and employment of the type of labor being shocked:

(1) $$\%\,\Delta\, W \;=\; S * [\frac{(-1)}{(Es + Ed)}]$$

(2) $$\%\,\Delta\, E \;=\; S * [\frac{(-1)Es}{(Es + Ed)}]$$

(3) $$D \;=\; (-1) * \%\,\Delta\, E/S \;=\; [\frac{Es}{(Es + Ed)}]$$

The labor market being analyzed is some labor market whose labor supply is being increased, although we may choose how finely to segment the labor market. %Δ *W* is the percentage change in wages in this labor market in response to a supply shock. %Δ *E* is the percentage change in employment for workers in this labor market, except those added to the labor force by the supply shock. *S* is the supply shock in this labor market, expressed as the additional labor force participants due to the supply shock as a percentage of the original employment level for the type of labor that we are analyzing. *D* is the displacement proportion, or the ratio of the loss of employment of the original labor force to the number of new labor force participants added to this labor market. *Es* is the elasticity of labor supply of this type of labor with respect to wages (that is the ratio of the percentage *increase* in the quantity of labor supplied to jobs to the percentage *increase* in wages, moving along a given labor supply curve). *Ed* is (-1) times the elasticity of labor demand for this type of labor with respect to wages (with the multiplication by minus one, this is the ratio of the percentage *increase* in the quantity of labor demanded to the percentage *reduction* in wages moving along a given labor demand curve). *S* is

of course positive, and *Es* and *Ed* should also be positive (recall that *Ed* is minus one times the elasticity of labor demand).[16]

From these three equations, if *Ed* is larger (labor demand responds more to wages), then the adverse effects of a labor supply increase on the original workers will be lower. With more responsive labor demand, the percentage change in wages in response to a supply shock will be smaller, the percentage loss in employment of the original labor force will be less, and the displacement proportion will be lower. In the figure, more responsive labor demand corresponds to a flatter labor demand curve. Intuitively, if labor demand is more responsive, a smaller wage adjustment is needed to restore equilibrium after a positive supply shock, and more adjustment is due to expanding demand rather than reducing employment of the original workers. To take an extreme case, if the elasticity of labor demand is infinite (the labor demand curve is a straight horizontal line), then wages and the employment of the original workers will be unchanged, with zero displacement.

In contrast, if *Es* is larger (labor supply is more responsive to wages), the implications for the effects of a labor supply increase on the earnings of the original workers are mixed. If labor supply is more responsive to wages, then a supply increase causes less of a reduction in wages, but has larger displacement effects on the employment of the original workers. In figure 2, more responsive labor supply corresponds to a flatter labor supply curve. Intuitively, if labor supply is more responsive, a smaller increase in wages is needed to restore equilibrium after a supply shock,

[16]These are standard results in economics, and can be found in many places in the literature, for example in Freeman (1977). These equations can be derived by specifying the equilibrium condition $Ls(w) + G = Ld(w)$, where $Ls(w)$ is labor supply as a function of wages, G is the supply shock, and $Ld(w)$ is labor demand as a function of wages. To derive the formulas, totally differentiate this equilibrium condition with respect to G and evaluate at $G=0$.

but more of the adjustment is due to reducing the labor supplied by the original workers. To take an extreme case, suppose *Es* is zero. In figure 2, the labor supply curve will be vertical. Then there will be zero displacement of the original workers, and the percentage decrease in wages will only depend on the elasticity of labor demand.[17]

What are plausible magnitudes for these labor demand and supply elasticities for a welfare reform supply shock? The answer depends in part on whether we want to know the effects of the welfare reform supply shock on the overall average wage and displacement of all labor, or on the wage rate and displacement rate for some particular type of labor, such as less-educated women. For the former, the relevant demand and supply elasticities are for overall labor; for the latter, the relevant elasticities are for less-educated women. These elasticities may be quite different.

Consider first labor demand elasticities. We know quite a bit about the wage elasticity of demand for overall labor. For overall labor demand, the relevant labor demand elasticity shows how overall labor demand varies with wages in response to a supply shock, allowing output and the equilibrium prices and quantities of other factors of production to change.[18] In the short-run, a positive supply shock to labor will increase overall output, but we can assume that the overall capital stock is unchanged. Hamermesh's comprehensive review of the labor demand literature suggests a "best guess" that the relevant elasticity under these conditions–with output allowed to

[17]These effects of labor supply and demand slopes could also be shown qualitatively by redrawing figure 2 several times with different slopes.

[18]Thus, the relevant demand elasticity is a general equilibrium elasticity in response to the supply shock. The output and other general equilibrium effects for a shock of one percent of the labor force will be small. However, the direct effect of the supply shock on overall wages, holding general equilibrium effects constant, is also small, so the general equilibrium effects still make a difference. If we write a factor price function with the log of the overall wage a function of the log of overall labor and the log of GDP, and suppress capital for short-run analysis, the factor price equation is $W = f(L,Y)$. The elasticity of the wage with respect to labor, holding output constant, is f_L, the partial derivative with respect to L. The elasticity allowing Y to change will be $f_L + f_Y Y_L$. These elasticities will be quite different even if the change in L is small.

vary, but capital held fixed–is about (minus three).[19] In the long-run, the relevant demand elasticity for overall labor will be even greater, because the capital stock and output will expand in response to the lower business costs caused by lower wages.[20] But even in the short-run, a labor demand elasticity of (-3) is large enough to dominate the calculations in the equations given above. If the elasticity of labor supply is small, wage and displacement effects of a given shock to overall labor will be small compared with the size of the supply shock. For example, if the elasticity of labor supply is zero, then percentage wage effects on average wages for labor overall will be about one-third of the percentage supply shock. Furthermore, the elasticity of labor supply would have to be greater than three for the displacement proportion to exceed one-half.

What does this imply for welfare reform? The welfare reform shock is estimated to be a maximum of 1.4 million additional labor force participants, about one percent of overall U.S. labor supply. The above discussion implies that it is unlikely that this shock would have large effects on average U.S. wages. In the short-run, the shock would reduce average U.S. wages by one-third of one percent if the elasticity of labor supply is zero, and by even less with any positive labor supply elasticity. Displacement effects would be small unless labor supply elasticities are

[19]The demand elasticity reported in the text is consistent with Hamermesh's conclusion that the "output-constant" elasticity of demand for overall labor is (-0.3). An output-constant elasticity is irrelevant because output will increase due to a labor supply shock. In the short-run, the relevant elasticity is one divided by the "factor price elasticity for overall labor", where the factor price elasticity shows how the wage that employers are willing to pay varies with the quantity of labor, holding capital constant. Hamermesh (1993) shows that the output-constant elasticity of demand for overall labor is -(1-*s*)*SUB* and the factor price elasticity is -(1-*s*)(1/*SUB*), where *s* is the factor share of labor, and *SUB* is the elasticity of substitution between labor and capital. Research suggests that *SUB* is close to 1. Hence, the relevant short-run demand elasticity is 1/(-0.3) = -3.33.

[20]One could argue that the long-run elasticity of demand for overall labor is infinite. Lower wages will increase profits, leading to investment. This investment will increase labor demand, leading to wage increases and profit declines. If long-run capital supply is perfectly elastic at a fixed profit rate, this process will continue until profit rates are restored to their original level. If production is constant returns to scale in capital and labor, the original profit rate cannot be restored until increased labor demand has restored wages to their original level. With constant returns to scale, the profit rate and wage rate can both be expressed as functions of the capital labor ratio alone, so restoring the original profit rate implies restoring the original wage rate.

very large, which will be discussed further below. In the long-run, capital expansion would expand labor demand and thus further reduce wage and displacement effects.

A recent article and book by Robert Solow reached different conclusions on the aggregate wage effects of welfare reform (Solow, 1998a, 1998b). Solow concluded that if welfare reform added about 1½ percent to the U.S. labor force, overall wages might be reduced by 3 to 5 percent. But he based this conclusion on the assumption that a 2 or 3 percent reduction in the average overall real wage is needed to increase overall employment by one percent. Hamermesh's estimates suggest this is true holding gross domestic product (GDP) constant. However, the responsiveness of aggregate labor demand is much greater if GDP is allowed to increase, which one would expect in response to an aggregate labor supply shock. Solow's estimates are based on the wrong concept of the aggregate labor demand elasticity. The true effect of a 1½ percent increase in aggregate labor supply, assuming a labor supply elasticity of zero, would be a wage reduction of about ½ percent.

But the welfare reform labor supply shock is concentrated on a particular type of labor, less-educated women. For evaluating the effects of this supply shock on the wages and employment of less-educated women, the relevant labor demand elasticity is the labor demand elasticity for less-educated women. Estimates of labor demand elasticities for particular types of labor vary greatly. In studies that use the wage of some less-skilled group as the dependent variable, and regress this wage on the employment of that less-skilled group, the implied labor demand elasticities are often much greater than one (Berger, 1983; Juhn and Kim, 1995; Borjas, Freeman, and Katz, 1997). In studies that use the employment of a less-skilled group as the dependent variable, and regress this employment on the wage of the less-skilled group, the

estimated labor demand elasticities are much less than one (Grant, 1979).[21] Reconciling these findings is hard.[22] Estimates of demand for less-skilled workers may be biased. Moderate positive elasticities of labor supply of less-skilled workers in response to wages will bias estimates with an employment dependent variable toward zero, and estimates with a wage dependent variable away from zero.[23]

Because of these diverse results, the consensus among economists is that we do not know much about the elasticity of demand for different types of labor. Or, as Hamermesh (1993) puts it in his 1993 review, "...we really know very little about the impact of different methods of estimating parameters describing labor-labor substitution or about the effects of thinking seriously about the interaction of relative supply and demand...Knowledge of the extent of substitution among various groups of workers is not well developed" (pp. 127, 136). I would argue that the most persuasive evidence suggests that labor demand elasticities for less-skilled workers are likely to be much less than one in absolute value. In my view, great weight should be placed on the empirical results from the minimum-wage literature in deciding what labor demand elasticities for

[21]Feedback effects from increased output are not that important in determining the slope of the demand function for a labor input with a small factor share. Suppose we write a factor price equation expressing the log of the wage of labor of type *i* as a function of the log of labor of type *i* and the log of *GDP*, or $W_i = f(L_i , Y)$. (We suppress other inputs that should also enter this function.) Then the elasticity of the wage of *i* with respect to the quantity of labor of type *i* is $f_{Li} + f_Y Y_{li}$. This is similar to the equation for overall labor in a previous footnote. However, in this case we would expect Y_{li} to be considerable smaller than was Y_L. That is, the effect on GDP of a percentage change in some labor input that is only a small portion of overall labor will be much smaller than the effect on GDP of the same percentage change in overall labor.

[22]Although these findings can be reconciled with some specifications of the production function, for many commonly used production functions these findings are contradictory.

[23]When employment is the dependent variable, unobserved demand shocks will move us along a supply curve, resulting in a positive correlation between the residual and wages, biasing the negative coefficient on wages towards zero. When the wage is the dependent variable, unobserved demand shocks will also lead to a positive correlation between the equation residual and employment, biasing the negative coefficient on employment toward zero. This will bias the implied slope of the labor demand curve, which is one over this coefficient on employment, away from zero.

less-skilled workers are plausible. In the minimum-wage literature, in which employment of teenagers (presumably less-skilled) is the dependent variable, the implied elasticity of teenage employment with respect to changes in teenage wages caused by the minimum wage is much less than one (Katz, 1998). For determining labor demand elasticities, the minimum wage literature has the advantage that the observed variation in wages is due primarily to exogenous policy decisions. Thus, minimum wage research is closer to a true natural experiment, in which we observe how employers adjust demand in response to different supply conditions for labor. Consequently, the labor demand elasticities implied by the minimum wage literature are more likely to be unbiased, compared to elasticities obtained elsewhere in the research literature on the demand for particular types of labor.[24]

There are also diverse estimates of the elasticity of labor supply. Traditionally, economists have believed that the labor supply of males and female household heads responds little to wages. However, some recent estimates suggest that labor supply elasticities for low-skilled groups may be modestly positive, perhaps as large as a 0.4 elasticity (Juhn, Murphy, and Topel, 1991).

In addition, the effective labor supply curve could be based on a "wage curve" (Blanchflower and Oswald, 1994), not a more conventional labor supply curve that describes labor force participation decisions. Wage curve models assume that firms may find it profitable to pay wages above the wage that clears the labor market, and as a result the equilibrium wage will be accompanied by involuntary unemployment. Above-market clearing wages may be profitable for firms by easing worker recruitment, improving worker productivity, and reducing worker

[24]One could argue that the literature on the labor market impacts of immigration, which shows modest impacts, suggests that labor demand elasticities for less-skilled workers must be large in absolute value. I will argue later in this section that immigration is not a pure labor supply shock, and so its impacts cannot be easily used to suggest likely labor demand elasticities.

turnover. The equilibrium wage curve is assumed to vary with unemployment, as higher unemployment makes higher wages less important to get, keep, or motivate productive workers. When the wage curve is combined with a labor force function that expresses the labor force as a function of wages and unemployment, the wage curve can also be written as an equilibrium relationship between wages and employment. This equilibrium relationship functions as the effective labor supply curve. Equilibrium wages, employment, and unemployment will satisfy both the demand function and the wage curve.

In wage curve models, the elasticity of labor supply will be higher than for conventional labor supply functions. For example, Blanchflower and Oswald's estimates of *aggregate* wage curves suggest an effective *aggregate* labor supply elasticity of around one, that is a one percent increase in overall employment is associated with a one percent increase in average wages.[25] As for wage curves for particular types of labor, the scanty available evidence suggests they also may show a high effective labor supply elasticity.[26]

Reviews of *The Wage Curve* and conversations suggest that most economists have some doubts about the theoretical basis for the wage curves estimated by Blanchflower and Oswald.[27]

---

[25]Blanchflower and Oswald estimate that the effect of ln(unem. rate) on ln(wage) is 0.1. At an unemployment rate of 6 percent, a one percent decrease in unemployment would increase wages about 1.6 percent. Cross-section studies suggest that a one percent decrease in unemployment increases labor force participation by perhaps half a percent (Bowen and Finegan, 1969). Combining these relationships, a 1.5 percent increase in employment is associated with about a 1.6 percent increase in wages.

[26]Blanchflower and Oswald do not find huge differences in the sensitivity of different groups' wages to overall unemployment (pp. 150-153); if some group's unemployment had huge effects on wages, greater differences would be expected. Also, see estimates below that suggest little sensitivity of relative wages of different groups to relative unemployment.

[27]David Card's review in the *Journal of Economic Literature* of *The Wage Curve* argues that although "most readers... will accept [the] conclusion that wages are negatively correlated with the local unemployment rate..., [o]f deeper interest to many readers will be the *interpretation* [italics in original] of this correlation...Even if the question of why local unemployment rates affect pay remains unsettled, as I believe it does, the existence of a wage curve relation is an important addition to our knowledge about the modern labor market." (Card, 1995, pp. 785, 798). Joe Stone's review of *The Wage Curve* in *Industrial and Labor Relations Review* (Stone, 1997) reaches

For example, labor market equilibria with unemployment could occur, not due to efficiency wage models, but due to the minimum wage. Minimum wages could lead to flatter estimated wage curves for less-skilled workers. Even with high unemployment, the wages of many unskilled workers will be prevented from declining by minimum wage regulations. Because the rationale for the wage curve is uncertain, one would be hesitant to assume that long-run equilibria in the labor market are necessarily determined by the intersection of a labor demand curve and a wage curve.

However, Blanchflower and Oswald's book persuades most economists that short-run wage curves are real. Their research establishes the empirical reality of a relationship between wages and unemployment through many estimations, covering diverse countries, times, and empirical methodologies. As David Card says in his *Journal of Economic Literature* review, "even skeptics will probably suspend disbelief in [the wage curve] after the first 50 or 60 tables of the book" (Card, 1995, p. 785).

So, in the short-run, it is reasonable to assume that the effective labor supply curve for labor is fairly flat, both for overall labor and for particular types of labor. What does this imply for the wage and displacement effects of welfare reform-induced shocks to the labor supply of less-educated women? Because of flat short-run wage curves for less-educated women, more of the short-run effects on less-educated women of welfare reform will take the form of displacement, rather than wage declines. In contrast, in the long-run, there is much more uncertainty about the slopes of labor supply curves. This implies considerable uncertainty about the long-run relative wage and displacement effects on less-educated women of the welfare reform supply shock.

---

a similar conclusion.

An increase in labor supply of one type of labor will also have spillover effects on wages and employment for other types of labor. Lower wages of the type of labor shocked, and the increased output due to the supply shock, will shift labor demand curves for other types of labor. For types of labor that are strong substitutes for the type of labor being shocked–for a welfare reform shock, these would probably be labor types with low skills and high proportions of women–labor demand would decline, reducing the wage and employment of these types of labor. For types of labor that are complements to the type of labor being shocked, or for which the expanded output from the supply shock outweighs any substitution effect–for welfare reform shocks, these might be types of labor with higher skills–labor demand would rise, increasing the wage and employment of these labor types. However, because we lack an empirical consensus about how substitutable different labor types are in production, no definite predictions can be made about the size of these effects. Fully modeling all these spillover effects would require a multiple labor sector model which allowed for any pattern of substitution or complementarity among the different labor inputs.

Other spillover effects of welfare reform are more difficult to model. Employment of some welfare recipients may cause employers to be more willing to hire other welfare recipients. Employed welfare recipients may provide job leads for friends, or be role models. Not much is known about the importance of these "information effects."

Immigration's Labor Market Effects: Analogous to Welfare Reform?

Most studies suggest that the labor market effects of U.S. immigration are modest (Smith and Edmonston, 1997). One interpretation of the modest labor market effects of immigration is

that labor demand elasticities for low-skilled workers must be large. Immigration is usually modeled as simply a labor supply shock, similar to a welfare reform because it is concentrated on lower-skilled workers. If immigration is seen as a supply shock, a large labor demand elasticity for less-skilled workers is the most natural explanation of modest labor market effects.

However, immigration should also be seen as a labor demand shock. Immigration will directly increase local labor demand because immigrants will bring with them assets and other non-labor sources of income, which will expand local labor demand. In addition, immigration to a local economy may increase agglomeration economies,[28] making the local area more attractive to firms, which will also expand local labor demand. Other research suggests that expansions in local labor demand will tend to disproportionately benefit the less-skilled, increasing employment and earnings by a greater percentage among various disadvantaged groups than among the overall population (Bartik, 1996). Therefore, the immigration shock to a local economy is also a relative labor demand shock that will increase relative demand for less-skilled workers.

The labor demand effects of immigration are supported by some results from the research literature on internal migration. There are some peculiar but consistent results in this literature suggesting that migration may be an extremely strong labor demand shock. For example, several studies have found that a one percent shock to the labor force from migration leads to a one percent increase in employment, even in the short-run (Muth, 1971; Greenwood and Hunt, 1984). These results support the idea that the assets, non-labor income, and agglomeration effects of migrants increase labor demand quite a bit.

[28]Agglomeration economies are productivity advantages associated with the size of a local economy (urbanization economies) or the size of a particular industry in a local economy (localization economies). For example, larger cities may be better able to support diverse networks of local suppliers, or may encourage innovative ideas.

Thus, researchers should be cautious in inferring the effects of welfare reform from the effects of immigration. The current version of welfare reform is close to a pure labor supply shock. (As mentioned in Ellwood and Welty's article, welfare reform that created jobs would be a combination of both labor demand and supply shocks). Immigration is probably some combination of labor supply shocks and labor demand shocks, although it has usually not been modeled that way.

4. A VARIETY OF SIMULATIONS PREDICTING THE DISPLACEMENT AND WAGE EFFECTS OF WELFARE REFORM

This section of the paper presents several types of simulations predicting the displacement and wage effects of welfare reform. I begin with some single sector models used by previous researchers to predict the wage effects of welfare reform. I then consider a multiple sector, market-clearing equilibrium model that was used by George Johnson to estimate the wage effects of immigration. Finally, I present simulations of the effects of welfare reform based on my own multiple sector model of the labor market with unemployment, which is a wage curve model.

Single-Sector Models of the Effects of Welfare Reform on Wages

Three previous studies provide simulations that predict the effects of welfare reform on wages. These studies are described in Table 4. If these studies are adjusted to the welfare reform supply shock assumed in this paper–1.4 million additional labor force participants by the year 2005–then the results from the three studies are consistent. All three studies imply that a welfare

reform shock of 1.4 million labor force participants will lower wages of some low-education group by 5 percent to 15 percent.

Mishel and Schmitt, and Holzer, consider their estimates to be somewhat unrealistic thought experiments. Holzer is concerned that many former welfare recipients may be so lacking in skills that they may be unable to compete for most low skill jobs. If this is so, wage effects on other less-skilled workers would be less than is assumed in Holzer's study, but nonemployment rates for ex-welfare recipients would be extremely high. Mishel and Schmitt also believe that nonemployment rates for ex-welfare recipients will be high. In addition, they imply that wages might not adjust downward as much as their estimates imply, and that welfare recipients who get jobs may displace others from jobs.

All three studies in table 4 use similar methodologies: focus just on one low-skill sector of the labor market, and assume that labor market sector has certain demand and supply elasticities. The assumed demand elasticities (-0.3 for all three studies) and supply elasticities (zero for Mishel and Schmitt, 0.4 for the other two studies) are consistent with some previous research. However, as discussed in section 3, some studies imply much higher demand elasticities for less-educated workers. In addition, one might get much higher supply elasticities in a wage curve model.

As the last two columns of table 4 show, one can get considerably different wage and displacement effects of welfare reform with different assumed demand and supply elasticities. With the higher demand elasticities favored by some studies and researchers, welfare reform only reduces wages by 1 or 2 percent, with very minor displacement effects. As mentioned in section 3, I would argue that a lower (in absolute value) demand elasticity for low-skilled workers is more realistic, based on the modest effects of the minimum wage, so I would regard these simulations

using larger demand elasticities as unrealistic. I believe higher supply elasticities are realistic, at least in the short-run, based on the extensive literature documenting a consistent short-run relationship between wages and unemployment, with this relationship implying a flat short-run supply curve. As shown in the last column of table 4, such higher supply elasticities imply more modest wage effects of welfare reform, but potentially huge displacement effects. For every 10 jobs gained by welfare recipients who enter the labor force, eight or nine jobs might be lost by other less-skilled workers.

These single-sector models by their very design only estimate effects in the labor market sector that is shocked, and are unable to examine effects on other labor market sectors. To examine effects on other labor market sectors requires a multi-sector labor market model, which we turn to next.

A Multi-sector, Market-Clearing Model of the Wage Effects of Welfare Reform

George Johnson has developed a general equilibrium simulation model of the effects of immigration that can be applied to welfare reform. I argued in a previous section that while current welfare reforms are best thought of as a pure labor supply shock to less-educated women's labor supply, immigration is better modeled as a combination labor supply and demand shock. Johnson's model, however, treats immigration as a labor supply shock only, and so is appropriate for modeling the labor market effects of welfare reform.[29]

[29]The November 1998 conference version of this paper also analyzed wage effects of welfare reform using two other multi-sector models of immigration: Borjas, Freeman, and Katz (1997), and Card (1997). These two models, however, do not distinguish between the effects of shocks to female labor supply versus male labor supply, which limits the relevance of these two models to welfare reform. For interested readers, the November 1998 version of this paper is available at the Upjohn Institute's web site, www.upjohninst.org.

Johnson's model divides the labor force into four groups, by gender and by education ("high school equivalents" and "college equivalents"). The four types of labor are assumed to be combined into an aggregate labor input via a CES production function with some elasticity of intraskill substitution. Aggregate labor and capital are combined to make output according to another CES production function. The model can estimate the response of wages to labor supply shocks both in the short-run, when capital is fixed, and in the long-run, when sufficient investment occurs for the return to capital to go back to its original level. The model can also allow for labor supply to respond to wages.

Because Johnson's model is a multi-sector model, in addition to examining labor market effects of welfare reform shocks on the labor types shocked, the model can examine labor market effects on other labor types. Johnson's model assumes the same elasticity of substitution among all four types of labor in the model. This assumption limits the types of spillover effects a supply shock to one type of labor can have on other types of labor. However, this simplifying assumption can be justified by our extremely limited empirical knowledge about how substitution possibilities in production vary among different types of labor inputs.

Table 5 presents estimates applying this Johnson model to welfare reform. As can be seen in Table 5, if we use Johnson's assumed labor demand parameters and educational groupings, welfare reform's effects on wages are quite modest, as are the effects of immigration in Johnson's model. These modest effects occur for two reasons. First, the size of the welfare reform supply shock is modest for all four groups of workers. Welfare reform's supply shock only increases the female high school equivalent labor force by a little more than two percent. Second, the parameter estimates assumed by Johnson imply that labor demand for less-educated workers is fairly

responsive to wages. The constant-output elasticity of labor demand for female high school equivalents with respect to their wage is about -1.3, which is modestly large in absolute value.

As Table 5 shows, the wage effects of welfare reform increase significantly if we use a different educational breakdown: high school dropouts vs. high school graduates. The welfare reform labor supply shock on the less-educated female group increases to almost 9 percent. Even with modestly large elasticities of labor demand, wages for this group are predicted to go down by 5 percent in response to the welfare reform supply shock.

I argued in section 3 that labor demand for less-skilled workers probably is not that responsive to wages, based on research showing that demand for less-skilled workers does not respond much to increases in the minimum wage. Therefore, I believe it more realistic to assume less ease of "intraskill substitution." Assuming a lower "intraskill substitution elasticity" of 0.5 seems to yield own-wage labor demand elasticities for less-skilled groups of around -0.5 or so, closer to what we would expect from the minimum wage literature. As Table 5 shows, with this less responsive labor demand, wages of less-skilled women decline by much more in response to welfare reform. In the high school vs. college grouping, the wages of high school equivalent women decline by 3.4 percent; in the high school dropout vs. graduate grouping, the wages of high school dropout women decline by 14.5 percent.

Which of these educational groupings is more appropriate? This is unclear based on current research. It seems likely that employers regard high school dropouts vs. high school graduates as distinct skill groups, contrary to the high school equivalent vs. college equivalent grouping, which treats high school dropouts and graduates as if they are perfect substitutes. On the other hand, it is possible that high school dropouts and graduates are better substitutes than is

suggested by the quite modest intraskill substitution elasticity parameter of 0.5. It would be reasonable to assume that welfare reform might lower the wages of female high school dropouts in the long-run by somewhere in-between the effects implied by the different substitution parameters. Thus, the effects of welfare reform would be to reduce wages of female high school dropouts by somewhere between 5 and 15 percent.

The model developed by Johnson is a market-clearing model, with no unemployment. Therefore, it is probably appropriate to regard the model as a long-run model. I have implicitly done so in Table 5 by focusing attention on wage effects in the long-run, after capital investment has fully adjusted to the supply shock caused by welfare reform. Because Johnson's model is a long-run, market-clearing model, it is probably inappropriate to try to incorporate into the model large labor supply elasticities that might be generated by short-run movements along a wage curve linking wages and unemployment. (The next subsection of the paper presents a wage curve model that does have high effective short-run labor supply elasticities due to wage curves.) However, Juhn, Murphy, and Topel (1991) estimate that low-skill labor might have a slight positive labor supply elasticity with respect to wages of 0.4, which they implicitly assume would persist in the long-run.[30] The bottom row of Table 5 reports the effects of assuming that high school dropouts have a long-run labor supply elasticity of 0.4. This assumption lowers the effect of welfare reform on female dropout wages, from a decline of -15 percent to a decline of -9 percent. Adding these modest labor supply elasticities also causes the model to have some displacement effects: as wages go down, some of the original unskilled workers no longer have jobs. For the parameter

[30]One could raise some doubts about whether Juhn, Murphy, and Topel's elasticities do hold in the long-run. Some of their elasticity numbers are implicitly derived from wage curve style short-run responses, for example by analyzing pooled annual time series cross-section data on wages and employment of different groups in different regions and years.

estimates assumed here, for every 10 welfare recipients in the female dropout category who get a job, about four women in the original female high school dropout group lose their job.[31]

Which model is more realistic, a model with zero long-run labor supply elasticities for all groups, or a model with modest labor supply elasticities of 0.4 for low-skilled groups? This must be regarded as an unsettled issue in economics research. In either case, with plausible low demand elasticities based on the minimum wage literature, welfare reform will have significant labor market effects. Long-run labor supply elasticities between zero and 0.4 merely make some modest differences in how the labor market effects are divided between lower wages versus greater displacement.

Because Johnson's multi-sector model assumes the same elasticity of substitution among all labor types in the model, some of the relative effects of welfare reform on labor types whose supply is not substantially shocked should be regarded with caution. For example, the model estimates similar wage effects of welfare reform on more- and less-educated males. A more general model would probably find that less-educated males are more substitutable for less-educated females than are more-educated males. Such a more general model would probably yield somewhat more negative effects on the wages of less-educated males, and somewhat more positive effects on the wages of more-educated males.

[31]This effect can be approximately calculated by taking the ratio of the labor supply elasticity of 0.4 times the change in the female high school dropout wage in Table 5 to the percentage shock reported for female high school dropouts, and then multiplying by minus one.

Welfare reform's effects in a wage curve model

I also simulated the effects of welfare reform in a wage curve model with involuntary unemployment. This 23-equation model is summarized in greater detail in the appendix to this paper. The model is designed to describe a state's labor market. The model is estimated using pooled annual time-series cross-section data for all 50 states and the District of Columbia for all years from 1979 to 1997. Five types of labor are included in the model: males and females, differentiated by whether they are college graduates or not, and a separate type of labor for less-educated female heads of household, ages 16-44, with other relatives in the household. The model includes demand equations and supply equations for each type of labor, and wage curves that express wages for each type of labor as a function of unemployment rates.

Preliminary versions of the model allowed for any type of substitutability in production among the five different labor inputs. This general version of the model ran into severe problems with multicollinearity. It is difficult to sort out how five wage rates affect five types of labor without imposing more structure on the estimation. The final version of the model (see appendix) imposes the assumption (similar to Johnson's) of the same elasticity of substitution among all labor inputs in the model.

The simulation uses the labor supply shocks due to welfare reform in the "best forecast" from Table 2 of this paper, for each year from 1994 to 2008. The model was simulated for a "typical state," based on projections of the percentage impact of welfare reform on the labor supply of each of the five labor groups. To represent the effects of implementing welfare reform in all states, the model was simulated with migration responses suppressed. The rationale for this

suppression is that if welfare reform is implemented in all states, there should be no net incentives for in- or out-migration.[32]

The basic simulation results are summarized in Figures 3 and 4 and Table 6. The simulation results show that welfare reform has very modest overall effects, with some effects on unemployment that occur first, and effects on overall wage rates later. The overall economy recovers from the welfare reform by the 2008 end of the simulation period, although it may be oscillating about the original equilibrium. The average overall unemployment rate is back to its original level by 2003, and the average overall wage rate is back to its original level by 2008.

However, in looking at different labor types, welfare reform has sizable effects on the unemployment rate for female household heads, the group whose labor supply receives the largest percentage shock from welfare reform. Higher unemployment rates for this group persist throughout the simulation, and unemployment rates for this group are driven up by more than three percent for most of the simulation period. Wage rates are driven down for female household heads only slightly more than for other groups. In this simulation, the wage effects of welfare reform on female household heads are much more modest than are the unemployment effects.

What explains this pattern of estimates? In this model, overall labor demand is responsive to supply shocks; overall unemployment has significant effects on average wages, and average wages have significant effects on labor demand. The overall economy adjusts easily to the welfare reform supply shock, which is but a small increase in overall labor supply. The pattern of

[32]An alternative way of modeling national effects would be to include national variables in the model (with year effects specified as random), and then to simulate what happens if national variables are equal to the same variables for the typical state. But national variables generally have insignificant effects or the "wrong sign" when entered into these state estimating equations. This suggests that unobserved national effects may be biasing these random effect estimates. Estimates with a national dummy for each year may be less biased; it is these estimates that are described in the appendix and reported in the text, tables, and figures.

adjustment of relative labor demand is quite different. Welfare reform is a large shock to relative labor supply, disproportionately increasing the labor supply of the female household head group. Because a group's unemployment has little effect on relative wages, however, relative wages of different groups are little changed by the welfare reform supply shock.[33] Furthermore, relative wages have little effect on relative labor demand. Because the relative supply shock has little effect on relative wages and relative wages have little effect on relative labor demand, demand for a particular type of labor is not particularly responsive to a supply shock focused on that type of labor. As a result, unemployment for the group whose labor supply is shocked increases quite a bit and persists at a higher level.[34]

For displacement, these simulated effects on unemployment imply little long-run displacement effects from welfare reform for workers overall, but large displacement effects on the female head group. In the short-run, (the year 2000), overall displacement is about .9; that is, for every 10 jobs gained by welfare recipients who enter the labor market due to welfare reform, nine jobs are lost by other persons. However, these overall displacement effects disappear entirely by 2004. Yet for female heads, for every 10 jobs gained by welfare recipients due to welfare reform, around three jobs are lost by other female household heads in the short-run (the year 2000), and about two jobs are lost by other female heads in the long-run (the year 2008).[35]

---

[33]This finding seems to hold in a variety of specifications. Relative unemployment has statistically significant effects on relative wages. The magnitude of these effects, however, is quite small compared to the effects of overall unemployment on overall wages.

[34]As discussed in the appendix, in this model there are some modest direct effects of labor force composition on the composition of who is hired. These direct effects are insufficient for labor demand for a type of labor to fully accommodate a supply shock targeted at that type of labor.

[35]Displacement is here defined as the loss of jobs in a given group or overall, compared to the gain in jobs for all welfare recipients who enter the labor market due to welfare reform, regardless of what group the welfare recipient is in. For more detail on the displacement estimates, see the November 1998 conference version of this paper.

How much faith should we put in these simulation results? The results showing relative labor demand is but modestly responsive to relative wages are consistent with the minimum wage literature. The results showing that relative wage rates are little affected by relative unemployment is consistent with previous results in the wage curve literature. Wage curve models focus on estimating short-run or at most medium-run relationships between unemployment and wages. Therefore, we should have the most confidence in this simulation model's estimates of the short-run and perhaps medium-run effects of welfare reform. Welfare reform is likely to increase unemployment and cause displacement for less-educated single mothers in the short-run. This paper estimates that welfare reform will be adding additional labor supply through 2005, so this higher unemployment for single mothers will persist through at least 2005. How much longer this higher relative unemployment will persist is more uncertain. Over the long-run, it is arguable that models such as Johnson's will become more appropriate, and such models suggest larger effects of welfare reform on the relative wages of less-educated women.

As with Johnson's multi-sector model, we should regard with caution some of the relative effects estimates because the model unrealistically assumes the same substitutability among all types of labor. For example, the model estimates very similar wage and unemployment rate effects of welfare reform on less- and more-educated men, two groups whose labor supply is little affected by welfare reform. These similar effects are an artifact of the implicit assumption that less- and more-educated men are equally substitutable for less-educated women. A more realistic assumption is that more-educated men are poorer substitutes for less-educated women than are less-educated men. Such a model would result in greater negative labor market effects of welfare reform on less-educated men, and less negative effects on more-educated men.

5. CAN WE SEE ANY EFFECTS OF WELFARE REFORM YET?

Casual evidence from national time-series

Can the wage and displacement effects of welfare reform already be seen in national data? In the "best forecast" in section 2, welfare reform increased the labor force from 1993-97 by more than 400,000 persons. This increase in the labor force was apparent in Figure 1, causing the labor force participation of female heads to deviate from trends for other less-educated women. The labor market effects of welfare reform might be evident in recent trends for female heads in wages and unemployment.

As shown in figures 5 and 6, from 1995-97 the wages of female heads declined compared with other less-educated women, and unemployment of female heads stayed stable while unemployment declined for other less-educated women. In 1997, the wages of female heads would have been 2.5 percent greater if their wages had followed 1995-97 trends for other less-educated women. Unemployment rates for female heads would have been 0.6 percent lower if they had followed 1995-97 trends for other less-educated women.[36] However, these effects are small enough that CPS data suggests they can be explained by compositional effects: female heads who are ex-welfare recipients have lower wages and greater unemployment than other female heads, and so more ex-welfare recipients in the female heads group would lower wages and increase unemployment for female heads, even if wages and unemployment of each individual were unchanged.[37]

---

[36]From 1995-97, the ln(wage) for female heads declined from 2.130 to 2.116, while the ln(wage) for other less-educated women increased from 2.141 to 2.152. From 1995-97, unemployment for female heads stayed at 11 percent, while unemployment for other less-educated women decreased from 6.0 percent to 5.4 percent.

[37]Based on the CPS, the 1997 female head population was 6.859 million. From 1995-97, labor force participation for this group increased from 69.5 percent to 75.7 percent, while the labor force participation for other less-educated females increased by only 0.4 percent. The extra labor supply of female heads because their

Reduced form estimates of the effects of recent reductions in welfare rolls on wages and unemployment rates

Table 7 presents reduced form estimates of how reductions in welfare rolls are associated with changes in wages and unemployment for the same five groups analyzed in the wage curve model. The adult population is divided by gender and by education into four groups. Another group is separated from the less-educated female group: female heads of household, with other relatives in the household, and 16-44 years of age.[38]

Estimates use pooled annual time series and cross-section data on all 50 states (plus the District of Columbia) from 1979 to 1997. All estimates include year dummies and state dummies, to control for unobserved time-period or state influences. The last estimates control for past trends in labor markets by including lags in wages and unemployment. In the table, the estimated effects based on past changes in welfare rolls are extrapolated into the future. The table simulates the effects of reducing welfare rolls by an amount equal to the maximum predicted reduction in welfare rolls in the "best forecast."

---

labor force participation increased more than 0.4 percent is ((75.7-69.9)/100) times 6.859 million =.398 million. These extra labor force participants are 7.7 percent (=.398/(.757*6.859)) of the total female head labor force in 1997. If unemployment had decreased from 11 percent to 10.4 percent among the "original" female head labor force, overall female head unemployment would stay at 11 percent if unemployment among the new participants was 18.3 percent. Data from the 1992-97 March CPS suggests that unemployment among female heads who received welfare the previous year averaged 37 percent, while unemployment among female heads who did not receive welfare the previous year averaged 7 percent. Suppose unemployment of the "original" female head group was 10.4 percent, and unemployment of new participants was 18.3 percent. Then employment of the new participants is .324 million out of total female head employment of 4.619 million, or 7.0 percent of total employment. For compositional effects to explain a relative wage decline of 2.5 percent in the ln(wage), the ln(wage) of the new participants must be 35.7 percent lower than those of the original labor force. Data from the 1992-97 March CPS shows that female heads on AFDC last year had an average ln(wage) of 1.786, versus an average ln(wage) of 2.190 for female heads not on AFDC last year.

[38]This is the closest one can come to consistently defining "single mothers" for all the years from 1979-97 in the CPS ORG data.

The estimates in column (1) make no attempt to correct for biases that occur because the ln(welfare receipt rate) will be endogenous. We expect lower unemployment or higher wages to lower welfare rolls. So, it is not surprising that column (2) shows that lower welfare rolls are associated with higher wages and lower unemployment for all groups. This association probably reflects causation from the economy to welfare rolls rather than the reverse.

The other estimates in the table attempt to control for the endogeneity of welfare rolls. The estimation strategy is to use state policy variables affecting welfare rolls as instruments for state welfare rolls. State welfare policy variables will be good instruments if state policy is not directly or indirectly caused by state labor market outcomes.[39]

Column (2) reports estimates that use state welfare benefits as an instrument. These estimates reverse the sign of the effects of welfare reform on wages, but not unemployment: welfare reform is now estimated to have negative effects on wages, but welfare reform is still estimated to reduce unemployment. These estimates are unconvincing, and suggest that welfare benefits is a poor instrument. It is difficult to believe that welfare reform reduces unemployment for all groups. There is evidence from some studies that state welfare benefits may be set higher when state unemployment is high, possibly due to political pressure from typical voters (Baiciker, 1998). If this is so, then using state welfare benefits as an instrument will lead to biased results, which is what we seem to get.

Columns (3) and (4) report estimated effects of welfare reform using as an instrument another policy variable: whether the state has been granted a waiver that year to experiment with

[39]In addition, to be a good instrument state policy variables must be good predictors of state welfare rolls, which they are. The F-tests on the instruments in the first-stage estimation prediction of state welfare rolls always have large values: 21.69 for the estimates in column (2), 12.07 for the estimates in column (3), and values greater than 30 in all cases in column (4).

its welfare program. These estimates are closer to expectations. The negative effects of welfare reform on wages are concentrated on female heads. Welfare reform's effects on unemployment for all groups are statistically insignificant, although the estimates are imprecise, and the point estimate suggests that welfare reform lowers unemployment for female heads.

I conclude that these reduced form estimates of the effects of welfare reform are unconvincing. The estimates suggest that a state policy variable such as welfare benefits is probably endogenous, which raises doubts about the whole strategy of using state policy variables as instruments. Convincing reduced form estimates of the effects of welfare reform will require instruments that shift the labor supply of welfare recipients independently of state policy or state labor market outcomes. Such instruments are hard to find.[40]

6. CONCLUSION

Based on the theories and studies reviewed in this paper, there is enough evidence for two conclusions about the labor market effects of welfare reform:

- Welfare reform is unlikely to have large effects on the overall national labor market. The labor supply shock from welfare reform is not large compared with the national labor force. It is difficult to create a plausible model in which a small labor supply shock would result in large overall wage or displacement effects. The overall labor market is flexible enough to respond to a small supply shock without huge adjustment problems for average wages or unemployment rates.

- It is likely that the labor supply shock from welfare reform will have substantial effects on labor market outcomes for the particular demographic groups on which the shock is most concentrated, such as female household heads, female high school dropouts, etc. The supply shock of welfare reform is a relatively large proportion of the labor supply of these demographic groups. The best evidence from current research suggests that a large

[40]One might consider national policy changes with differential effects across states, for example, the changes in income disregards implemented in 1981 by President Reagan, or changes in the 1950s and 1960s in federal matching rates for state welfare spending.

> relative labor supply shock will have significant labor market effects. This conclusion can only be avoided if one is willing to assume a labor market that quickly clears and has unusually large labor demand elasticities for less-educated women. Yet the wage curve literature suggests that in the short-run, supply shocks will affect relative unemployment. The minimum wage literature suggests that in the long-run, it will take quite a bit of a reduction in relative wages for relative labor demand to adjust to a supply shock.

Although these predicted effects of welfare reform are supported by theory and empirical evidence, it should be noted that as of yet, little effect of welfare reform on unemployment or wages is observable, although welfare reform has already had readily observable effects on the labor supply of some groups. However, the evidence should soon become much stronger. Over the next few years, as welfare reform is aggressively pursued, this paper predicts adverse trends in the real earnings of less-educated women that are large enough to be observable. This paper has made testable predictions. If these predictions prove false, this will require rethinking the appropriate models and estimates for understanding how labor demand and wages for different demographic groups respond to labor supply shocks.

References

Baicker, Katherine, "Fiscal Federalism and Social Insurance," Harvard University Doctoral Thesis, May 1998.

Bartik, Timothy J., "The Labor Supply Effects of Welfare Reform," W. E. Upjohn Institute for Employment Research working paper, July 1998. Available at: http://www.upjohninst.org.

Bartik, Timothy J., "The Distributional Effects of Local Labor Demand and Industrial Mix: Estimates Using Individual Panel Data," *Journal of Urban Economics* 40 (September): pp. 150-178. 1996.

Bartik, Timothy J., "Who Benefits from Local Job Growth: Migrants or the Original Residents?" *Regional Studies*, 27 (4): pp. 297-311, 1993.

Berger, Mark. "Changes in Labor Force Composition and Male Earnings: A Production Approach." *Journal of Human Resources*, 18: 177-196, 1983.

Bernstein, Jared, "Welfare Reform and the Low-Wage Labor Market: Employment, Wages, and Wage Policies," EPI Technical Paper #226, Economic Policy Institute, Washington, DC, November 1997.

Bishop, John H., "Is Welfare Reform Succeeding?" Cornell University ILR School Working Paper, August 1998.

Blanchflower, David G. and Andrew J. Oswald, *The Wage Curve*. Cambridge, MA: The MIT Press, 1994.

Blank, Rebecca M., "What Causes Public Assistance Caseloads to Grow?" NBER Working Paper 6343. Cambridge, MA: National Bureau of Economic Research, December 1997.

Borjas, George J., Richard B. Freeman and Lawrence F. Katz, "How Much Do Immigration and Trade Affect Labor Market Outcomes?" *Brookings Papers on Economic Activity 1*, pp. 1-90. 1997.

Bowen, William G. and T. Aldrich Finegan, *The Economics of Labor Force Participation*. Princeton, NJ: Princeton University Press, 1969.

Card, David, "The Wage Curve: A Review," *Journal of Economic Literature*, 33 (June 1995), pp. 785-99.

_____, "Immigration Inflows, Native Outflows, and the Local Labor Market Impacts of Higher Immigration," NBER Working Paper 5927, National Bureau of Economic Research, Inc., February 1997.

Chernick, Howard and Andrew Reschovsky, "State Responses to Block Grants: Will the Social Safety Net Survive?" Technical paper, Economic Policy Institute, Washington, DC, July 31, 1996.

Daly, Mary, "Labor Market Effects of Welfare Reform" FRBSF Economic Letter, Number 97-24, August 29, 1997, Federal Reserve Bank of San Francisco. Available at http://www.frbsf.org/econrsrch/wklyltr/el97-24.html.

Danziger, Sandra K. and Sherrie A. Kossoudji, "When Welfare Ends: Subsistence Strategies of Former GA Recipients." Final report of the General Assistance Project. School of Social Work, University of Michigan, Ann Arbor, February 1995.

Danziger, Sheldon, Robert Haveman and Robert Plotnick, "How Income Transfer Programs Affect Work, Savings, and the Income Distribution: A Critical Review," *Journal of Economic Literature*, 19 (September 1981): pp. 975-1028.

Duncan, Greg J., Kathleen Mullan Harris, and Johanne Boisjoly, "Time Limits and Welfare Reform: How Many Families Will Be Affected?" Working paper, Joint Center for Poverty Research, Northwestern University and University of Chicago, March 9, 1998. Available at http://www.nwu.edu/IPR/publications/nupr.

Edin, Kathryn and Laura Lein. *Making Ends Meet: How Single Mothers Survive Welfare and Low-Wage Work*. New York: Russell Sage Foundation, 1997.

Ellwood, David T. and Elisabeth D. Welty, "Public Service Employment and Mandatory Work: A Policy Whose Time Has Come and Gone and Come Again?" This volume.

Freeman, Richard B., "Manpower Requirements and Substitution Analysis of Labor Skills: A Synthesis." In Ronald G. Ehrenberg, *Research in Labor Economics: An Annual Compilation of Research*, Vol. 1. Greenwich, CT: JAI Press, 1977.

Grant, James. *Labor Substitution in U.S. Manufacturing*. Unpublished Ph.D. dissertation, Michigan State University, 1979.

Greenwood, Michael J. and Gary L. Hunt, "Migration and Interregional Employment Redistribution in the United States," *The American Economic Review*, 74 (5): pp. 957-969, December 1984.

Hamermesh, Daniel S., *Labor Demand*. Princeton, NJ: Princeton University Press, 1993.

Holzer, Harry J., "Employer Demand, AFDC Recipients, and Labor Market Policy," Institute for Research on Poverty Discussion Paper No. 1115-96, November 1996.

Johnson, George E., "The Impact of Immigration on Income Distribution Among Minorities." In Daniel S. Hamermesh and Frank D. Bean, eds. *Help or Hindrance: The Economic Implications of Immigration for African Americans*. New York: Russell Sage Foundation, 1998.

Juhn, Chinhui, Kevin Murphy, and Robert Topel. "Why Has the Natural Unemployment Rate Increased Over Time?" *Brookings Papers on Economic Activity* 2: 75-142. 1991.

Katz, Lawrence F., "Wage Subsidies for the Disadvantaged." In Richard B. Freeman and Peter Gottschalk, eds. *Generating Jobs: How to Increase Demand for Less-Skilled Workers*, pp. 21-53. New York: Russell Sage Foundation, 1998.

Levine, Phillip and Diane Whitmore, "Technical Report: Explaining the Decline in Welfare Receipt, 1993-1996." Report, President's Council of Economic Advisers, May 9, 1997. Available at http://www.whitehouse.gov/WH/EOP/CEA/Welfare/Technical_Report.html.

McMurrer, Daniel P., Isabel V. Sawhill, and Robert I. Lerman, "Welfare Reform and Opportunity in the Low-Wage Labor Market." Working Paper No. 5, Opportunity in America Series, The Urban Institute, July 1997. (1997a).

McMurrer, Daniel P., Isabel V. Sawhill, and Robert I. Lerman, Spreadsheets Used to Estimate Effects of Welfare Work Participation Requirements, July 1, 1997. (1997b)

Meyer, Bruce D. and Dan T. Rosenbaum, "Welfare, the Earned Income Tax Credit, and the Labor Supply of Single Mothers." Working Paper, Northwestern University, March 31, 1998.

Michigan Family Independence Agency, "April 1996 AFDC Case Closures Due to JOBS Sanctions." Report, Lansing, MI, 1998. Available at http://www.mfia.state.mi.us/sanction

Mishel, Lawrence and John Schmitt, "Cutting Wages by Cutting Welfare: The Impact of Reform on the Low-Wage Labor Market," Economic Policy Institute Briefing Paper, Economic Policy Institute, Washington, DC, 1995.

Muth, Richard F., "Migration: Chicken or Egg?" *Southern Economic Journal* 37 (January 1971): 295-306.

Smith James P. and Barry Edmonston, eds. *The New Americans: Economic, Demographic, and Fiscal Effects of Immigration*. Washington, DC: National Academy Press, 1997.

Solow, Robert M. *Work and Welfare*. Princeton, NJ: Princeton University Press, 1998(a).

Solow, Robert M. "Guess Who Pays for Workfare?" *The New York Review of Books*, November 5, 1998(b). Available at http://www.nybooks,com/nyrev.

Stone, Joe A. Review of *The Wage Curve*, by David G. Blanchflower and Andrew J. Oswald. *Industrial and labor Relations Review*, 50 (3), (1997), pp. 526-27.

Treyz, George I., Dan S. Rickman, Gary L. Hunt, and Michael J. Greenwood, "The Dynamics of U.S. Internal Migration," *The Review of Economics and Statistics*, Vol. LXXV (May 1993): 209-214.

Tweedie, Jack and Dana Reichert, "Tracking Recipients After They Leave Welfare: Summaries of State Follow-Up Studies," Report, National Conference of State Legislatures, Denver, CO, February 1998. Available at http://www.ncsl.org/statefed/welfare/followup.htm.

Uchitelle, Louis, "Welfare Recipients Taking Jobs Often Held by the Working Poor." *New York Times*, April 1, 1997.

U.S. Department of Health and Human Services, "Welfare Caseloads: Families and Recipients, 1936-1998," Administration for Children and Families, 1998. Available at http://www.acf.dhhs.gov/news/3697.htm.

U.S. Department of Labor, Bureau of Labor Statistics, "Employment Characteristics of Families in 1997." May 1998. Available at http://stats.bls.gov/newsrels.htm.

Vobejda, Barbara and Judith Haveman, "States' Welfare Shift: Stop It Before It Starts: 'Diversion' to Alternatives Cuts Caseload," *Washington Post*, August 18, 1998, http://www.washingtonpost.com/wp-srv/WPlate/1998-08/12/0921-081298-idx.html.

Vobejda, Barbara and Judith Haveman, "Sanctions: A Force Behind Falling Welfare Rolls," *Washington Post*, March 23, 1998, pp. A01.

Appendix

The wage curve model used in this paper is summarized in Table A-1. On the demand side, the model includes an equation for overall labor demand, equations for the share of demand for five different types of labor, and a personal income equation that allows expansions in state employment to feed back into expanded local demand. On the supply side, the model includes a wage curve expressing overall wages as a function of overall unemployment, five relative wage curve equations determining relative wages for each type of labor, and labor force participation and population migration equations for each type of labor.

All equations in the model include fixed state and time period effects, to allow for unobserved influences of state characteristics and the national economy. The model is identified via lags. It is assumed that labor demand, labor supply, wages, and migration respond to their various determinants only after a lag. Although this assumption of lagged response seems plausible, it is imposed by assumption rather than estimated. The lagged structure of the model does impose the implicit assumption that there will in the short-run be some immediate displacement in response to a labor supply shock: it takes time for unemployment to affect wages and in turn cause labor demand to increase in response to the supply shock. Adjustment is not allowed to take place instantaneously in the model.[41]

As shown at the bottom of Table A-1, where the model is estimating well-established parameters, the estimates are consistent with this previous research. The overall labor demand elasticity is about the expected size, the labor supply responses to wages and unemployment rates

[41]The model does allow an immediate response of the employment share of a group to changes in the labor market share of the group. The assumption is that employer hiring responds to who happens to be applying for jobs.

are plausible, the sensitivity of wages to unemployment is consistent with research by Blanchflower and Oswald, lower unemployment has greater effects on wages at low unemployment rates as was found by Blanchflower and Oswald,[42] and the responses of migration to wages and unemployment seem plausible.

The model also estimates various parameters for which no real consensus is available from previous research. Relative labor demand is not very sensitive to relative wages.[43] However, the model also allows for relative demand for each labor type to be directly affected by the availability of different types of labor. The rationale for this direct supply effect is that employer hiring of different labor types may depend on who applies for the job.[44] This direct effect of relative supply on relative demand is highly statistically significant in the model.

The model also estimates that relative wage curves are not very sensitive to relative unemployment rates. I know of no previous findings on relative wage curves and relative unemployment.[45]

---

[42]The estimation of the wage curve tested entering unemployment into the equation in various ways: the log of the unemployment rate, one over the unemployment rate, the unemployment rate, and the unemployment rate and unemployment rate squared together, with the final model chosen using the Akaike Information Criterion. The preferred model for overall wages uses the log of the unemployment rate; the preferred model for relative wages uses the unemployment rate itself, except for female heads and less-educated females, which use one over the unemployment rate.

[43]Note that the specified model, with log(employment share) as a function of log(relative wages), could be derived from a production function with a labor aggregate and a constant elasticity of substitution among all the labor types. However, the estimation does not impose the complete restrictions that would be implied by a CES function. Each employment share is allowed to have its own response to relative wages. The model simulation then adjusts the shares to force them to add up to one. A preliminary version of the model allowed employment for each type of labor to respond to all five wages; this model showed even less effects of relative wages on relative employment.

[44]The labor force share was added to the model because preliminary estimates showed relatively little response of the employment shares to shifts in relative supply; the intent was to allow another avenue of response. However, as shown in the main text of this paper, even with this extra avenue of response, employment shares do not completely adjust to supply shocks in any medium-term time period.

[45]A preliminary version of the model allowed each group's wage to be affected by unemployment rates for all five groups. This model showed even less sensitivity of relative wages for a group to relative unemployment.