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Moving Public Assistance Recipients Into the Labor Force, 1996-2000



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Kenneth Hanson
Karen S. Hamrick



*Food Assistance & Nutrition
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Moving Public Assistance Recipients Into the Labor Force, 1996-2000

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Abstract

Moving recipients of public assistance into jobs is a goal of the current system for providing public assistance to low-income households. Using scenario analysis with a computable general equilibrium model, ERS researchers examined some of the labor market impacts of the “welfare-to-work” provisions of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA). The results show that, from 1996 to 2000, the influx of public assistance recipients into the labor force put downward wage pressure on low-skill occupations, making wage growth smaller than it would have been without the influx. At the same time, the influx added workers to the labor force, which contributed to economic growth. By expanding the labor force, the influx contributed 1 percentage point of real economic growth in terms of gross domestic product from 1996 through 2000.

Keywords: Public assistance, low-income households, Food Stamp Program, welfare reform, labor markets, low-skill, computable general equilibrium (CGE) model, scenario analysis.

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Summary

Moving recipients of public assistance into jobs is a goal of the current system for providing public assistance to low-income households. Using scenario analysis with a computable general equilibrium model, ERS researchers examined some of the labor market impacts from the “welfare-to-work” provisions of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA). The results show that, from 1996 to 2000, the influx of public assistance recipients into the labor force put downward wage pressure on low-skill occupations, making wage growth smaller than it would have been without the influx. At the same time, the influx added workers to the labor force, which contributed 1 percentage point of real economic growth in terms of gross domestic product in the late 1990s.

Favorable labor-market conditions for entry-level and low-skill workers are important to the success of welfare reform and the current system of public assistance. In the late 1990s, the growing U.S. economy generated many new jobs, particularly in low-skill or entry-level occupations, where most public assistance recipients found job opportunities. The large influx of recipients moving into the labor force during that period would be expected to affect economic growth and the wages and employment opportunities of other low-skill workers.

ERS researchers set out to examine some of the labor market impacts from the “welfare-to-work” provisions of PRWORA from 1996 to 2000, and to determine how changes in macroeconomic conditions affect labor markets and public assistance. The authors used a computable general equilibrium (CGE) model to assess the magnitude of the impact of moving public assistance recipients into the labor force on the low-skill labor market under alternative macroeconomic conditions.

The results show that the influx of public assistance recipients into the labor force from 1996 through 2000 put wage pressure on low-skill occupations. When the influx is isolated from other macroeconomic changes occurring during the period, the pressure is measured as a decreased real wage. The authors estimated a movement of 2.4 million recipients of public assistance into the labor force from 1996 through 2000. If one assumes that all of the labor supply increase were in low-skill jobs, real wages for those types of jobs would be depressed by as much as 7.2 percent. If one assumes that the jobs taken by the new workers matched the occupations of already employed low-income workers, real wages would decline by only 2.3 percent for low-skill jobs.

When the labor force influx is distributed over a broad range of occupations and there is strong economic growth as in 1996-2000, the wage pressure is measured as reduced wage growth. Wage growth is reduced by 2.5 percentage points for low-skill workers, lowering their wage growth from 6.9 percent to 4.4 percent. However, the larger labor force that results from public assistance recipients moving into the labor force contributes to the strong economic growth, accounting for 1 percentage point of real gross domestic product growth over 1996-2000.

Economic growth is not just good for the economy overall, but good for low-skill jobs. The particularly strong growth of 1996-2000 created a large number of low-skill jobs and allowed many public assistance recipients to move into the workforce. The movement of public assistance recipients into the workforce supported the economic growth, while also reducing real wage growth for low-skill workers. The wage impact is a “spillover effect,” or unintended consequence of a welfare-to-work system of public assistance. These findings are useful for the formulation and evaluation of public assistance programs because they provide insight into the low-skill labor market.

Introduction

One goal of the system for providing public assistance to low-income households, as legislated in the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996, is to move public assistance recipients into jobs. Consequently, labor market conditions for entry-level and low-skill workers are important to the success of welfare reform and public assistance.

In 1996, the year PRWORA was enacted, the U.S. labor market began to tighten in the economic expansion of 1991-2001.^{1,2} This was a good time to implement a welfare-to-work policy because the growing U.S. economy generated many new jobs, particularly in low-skill or entry-level occupations, which are the primary job opportunities for most public assistance recipients. According to this study, employment of public assistance recipients during this period contributed significantly to employment growth in low-skill occupations, which contributed to growth in the economy. However, the movement of these recipients into the labor force also affected the wages and employment opportunities of other low-skill workers. These “spillover effects” are indirect consequences of welfare reform (Bartik, 2002).

The welfare-to-work focus of public assistance since welfare reform in 1996 raises three important questions, which this study addresses:

- (1) How did the influx of public assistance recipients into the labor force affect the labor market from 1996 through 2000?
- (2) How do alternative macroeconomic conditions affect the ability of labor markets to absorb the new workers and consequently affect the effectiveness of public assistance?
- (3) Were public assistance recipients who moved into the workforce better off, by attaining higher incomes, than when they received public assistance?

To address these questions, this study focuses on recipients of the Food Stamp Program (FSP) and Aid to Families with Dependent Children (AFDC) or Temporary Assistance for Needy Families (TANF), and on the low-skill or entry-level jobs for which the majority of the recipients tend to be qualified. The FSP and AFDC-TANF are the two public assistance programs for which caseloads are most influenced by labor market conditions and have been affected most by the welfare-to-work focus of public assistance. Though the work requirements of welfare reform directly affect only a small share of the FSP caseload, able-bodied adults without dependents (ABAWDs), the work requirements indirectly affect much of the caseload because participants who leave AFDC-TANF to work either leave the FSP as well or change their work status while continuing to participate in the FSP.

We use scenario analysis with a computable general equilibrium (CGE) model rich in labor market detail that distinguishes labor supply (workers) and demand (jobs) by skill levels to analyze the labor market impacts of recipients of public assistance moving into the labor force under alternative macroeconomic conditions. In addition, we developed a household component of the model so that we could distinguish the impacts on low-income households that receive public assistance from the impacts on low-income households that do not receive public assistance.

¹PRWORA sets some eligibility conditions, including a work rule. States are required to achieve minimum rates of work participation. Creditable work activities and required hours of work participation are specified. Laws governing the Temporary Assistance for Needy Families (TANF) prescribe penalties against States that do not meet minimum work participation rates. With respect to benefits, most States have work incentives such that a portion of earnings is disregarded in calculating benefits.

²In a *tight* labor market, jobs are more plentiful relative to job seekers. Measures of tightness include the unemployment, quit, layoff, and wage rates. Our preferred indicator of labor market tightness is the total compensation (wages/salaries plus benefits) as measured by the Employment Cost Index (ECI). In 1996, the ECI for total compensation started to increase after steady declines from 1991 to 1995.

From Public Assistance to Work

To address our first research question—how to assess the labor-market impact of the influx of public assistance recipients into the labor force—we begin by looking at economic theory. In a static or no-growth setting, neoclassical economic theory posits that wages will fall and employment will increase in response to an increase in labor supply that is, a shift out of the labor supply curve (fig. 1a). Some would say that, at the new equilibrium, workers are now worse off. Even though the new workers now have jobs, those workers (E_{0w1} in fig. 1a) who were already employed are working at a lower wage. In addition, some workers who were previously employed now drop out of the labor market because the new wage is below their reservation wage (E_0-E_{0w1} in fig. 1a).³ They are displaced by the new workers who are willing to work at the lower wage. In the short run, however, wages may not adjust. Nominal wages are “downwardly sticky.” Consequently, unemployment may result because the quantity of labor demanded at the prevailing wage is less than the number of workers willing to work at that wage (fig. 1b). Over time, real wages adjust down and firms will hire more workers, bringing the labor market to a new equilibrium.⁴

Economists have used various approaches in applying the labor supply and demand model for estimating the impact of public assistance recipients moving into the labor market. These approaches reflect differences in modeling employment, unemployment, displacement, and wage effects.⁵ Most applications used static analysis and assumed the economy is in a stationary state. Here we discuss how these alternative approaches alter estimates of labor market adjustments.

The literature on estimating the effects of a labor supply shift can be categorized by whether or not those in the labor force adjust their labor supply to changes in wages: That is, is the elasticity of the labor supply zero (fig. 1c)—perfectly inelastic—or is it positive sloping upward?⁶ With a zero labor supply elasticity, there is no displacement in that existing workers continue to be employed, albeit at a lower wage, and new job seekers obtain employment (fig. 1d). As the labor supply elasticity increases, displacement increases and the wage adjustment is reduced: That is, the wage rate does not have to decline as much to reach the new equilibrium (fig. 1e, w_0 to $w_{\text{inelastic}}$ versus w_0 to $w_{\text{inelastic}}$ for a given shift in labor supply). The range of estimates used for low-skill labor supply elasticities is 0, perfectly inelastic, to 0.4, very inelastic (Katz, 1998; Bartik, 2000). With these inelastic labor supply estimates, the reduction in labor supply by displacement is minor.

The magnitude of the wage and employment impacts depends not only on the labor supply elasticity but on the labor demand elasticity as well. If the labor demand elasticity is zero—perfectly inelastic—then firms will not alter employment in response to a change in wages, and consequently, an increase in labor supply will occur as a wage decline only (fig. 1f). The more elastic the labor demand is, the less wages have to adjust for firms to hire the new labor (fig. 1g, w_0 to $w_{\text{inelastic}}$ versus w_0 to $w_{\text{inelastic}}$). The demand response has implications for the labor market outcome in that a more elastic labor demand reduces the wage adjustment necessary for a new labor market equilibrium.

³The reservation wage is the minimum wage an individual will accept. At a prevailing wage below the reservation wage, the individual would become or stay unemployed or drop out of the labor force. An individual’s reservation wage is for a point in time and may change over time, such as after a long duration of unemployment. The reservation wage is influenced by a variety of factors, such as unemployment benefits, welfare benefits, the individual’s wealth, and the value to the individual of nonmarket work, such as education or child-rearing (Ehrenberg and Smith, 1994).

⁴In observed labor markets, we rarely see wages adjust downward in the obvious way that we see on a supply and demand graph. Consequently, wages are “downwardly sticky”—we observe wages going up but not down. Reservation wages are part of the explanation of this stickiness and of the existence of unemployment. Also, there are time lags—labor markets have less perfect information than most other markets, so adjustment is sometimes slow. In addition, union contracts and other employer-employee agreements can postpone adjustments. However, additional factors influence wages. Wages, and more accurately, compensation (wages/salaries plus benefits) can indeed adjust downward. Over time, downward wage adjustments frequently take the form of real adjustments, not nominal. So, the nominal wage could stay the same while inflation erodes the real value. Also, employers frequently adjust benefits while keeping the wage/salary level constant. Benefits such as health insurance, retirement benefits, and vacation days may be added or subtracted, changing total compensation while earnings remain constant.

⁵Displacement can take several forms. First, lower wages from an increase in labor supply are an incentive for current employees and job seekers to work less or exit the labor force. This form of displacement is a rational labor supply decision by existing workers and job seekers. Second, welfare recipients entering the labor force compete with existing job seekers, resulting in some nonwelfare recipients remaining unemployed.

⁶Elasticity is defined as a percentage change in employment for a given percentage change in the wage. Elasticity measures how sensitive employment is to a change in the wage.

Estimates used in studies of low-skill labor for labor demand elasticity range from -0.1 to -0.6, with a central value of -0.3 (Hamermesh, 1993; Katz, 1998; Bartik, 2000). Most studies assume zero labor supply elasticities and a -0.3 labor demand elasticity, resulting in a longrun outcome of no displacement and a decrease in wages of 7 percent to 14 percent (about 65 cents per hour). Using a -0.5 labor demand elasticity, Bartik (2000) found that, with a zero labor supply elasticity, wages for less-educated women fall by 3.4 percent for the high school equivalent labor skill group, and by 14.5 percent for the high school dropout labor skill group. With a labor supply elasticity of 0.4, the decline in wages of women without a high school diploma is reduced from 14.5 percent to 9 percent, and some existing workers are displaced. The displacement rate is 0.42—that is, for every additional worker added to labor supply and employment, 0.42 worker of the initial labor supply is no longer employed.

The typical labor market model is specified in context of a nonexpanding or stationary economy with fixed capital stocks and production capacity. However, an increase in labor supply and resulting reduction in the wage may make it cost-effective for firms to expand capacity and/or alter their technology, which increases the demand for labor (fig. 1h). This condition occurs when the greater use of labor per unit of fixed capital increases the return to capital, and the higher return to capital stimulates investment, expanding capacity. With both an increase in labor supply and an increase in labor demand, we know that the number of workers employed will increase, but the wage outcome is indeterminate; the resulting wage depends on the magnitude of the shifts and elasticities of labor supply and demand. So, the resulting wage could be less than, equal to, or greater than the original wage. This is the difficulty in estimating labor market outcomes without restrictive assumptions.

Bartik (2000) approximated this situation of a shift in both labor supply and labor demand by developing a scenario where investment occurs and capital stocks expand until the rate of return to capital returns to the old level. Domestic demand and exports expand as the price for final goods are reduced given lower unit costs due to lower wages. Domestic demand for new production also increases from the additional income earned by the new workers and the returns to capital received by owners. The expansion in capital has a feedback effect on the labor market—demand for labor increases as a result of increased product demand—reducing the wage and displacement adjustments. How much the wage and displacement adjustments are reduced depends on the substitutability of labor in production. His scenario produced the employment and wage impacts discussed earlier. We use this capital adjustment scenario in our simulation analysis to account for the resulting shift in labor demand expected after a wage decrease.

An alternative more complex situation occurs when the economy expands or contracts and the labor force experiences a new influx of workers. Because the economy is dynamic, changes in the macroeconomic situation causes constant shifting of labor supply and labor demand. As gross domestic product (GDP) growth increases, so does demand for consumer goods increase, and consequently demand for labor will increase, shifting labor demand to the right (increase). As GDP growth falls, so does demand for consumer goods decrease, and consequently demand for labor will decline,

Figure 1a
Increase in labor supply

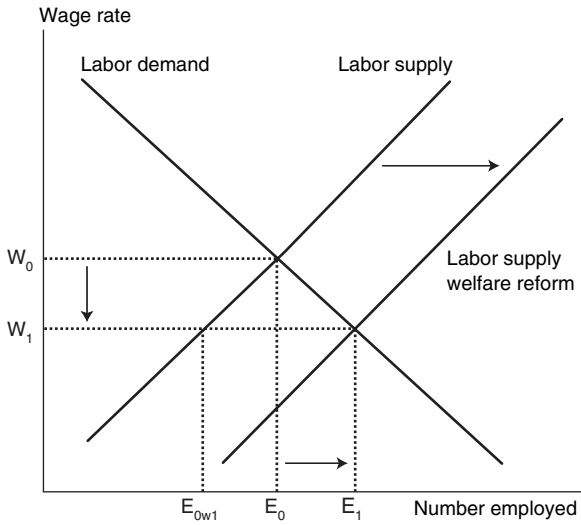


Figure 1b
Increase in labor supply with unemployment

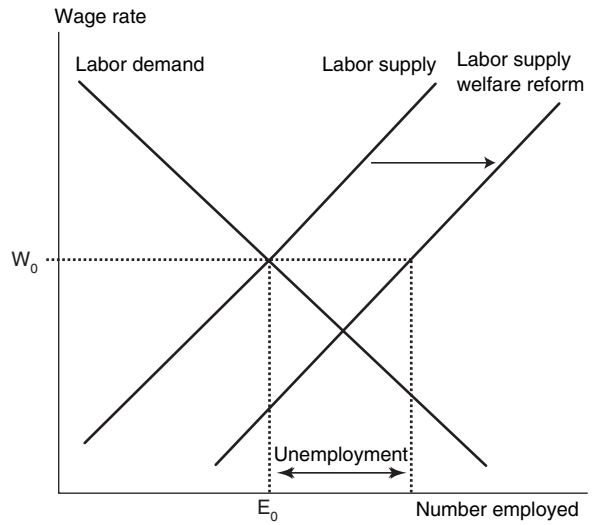


Figure 1c
Zero elasticity (perfectly inelastic) labor supply

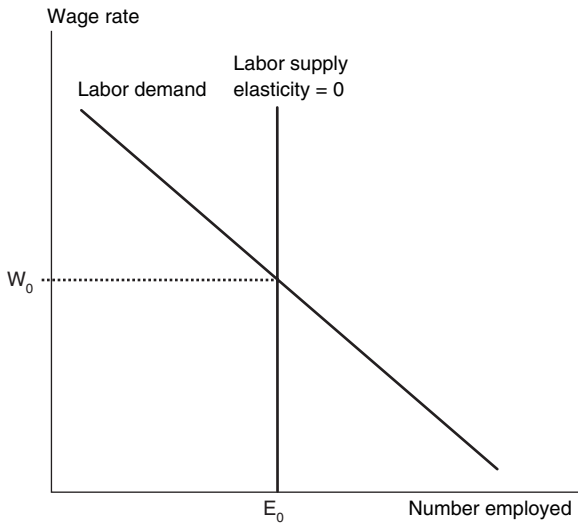


Figure 1d
Increase in labor supply, zero elasticity labor supply

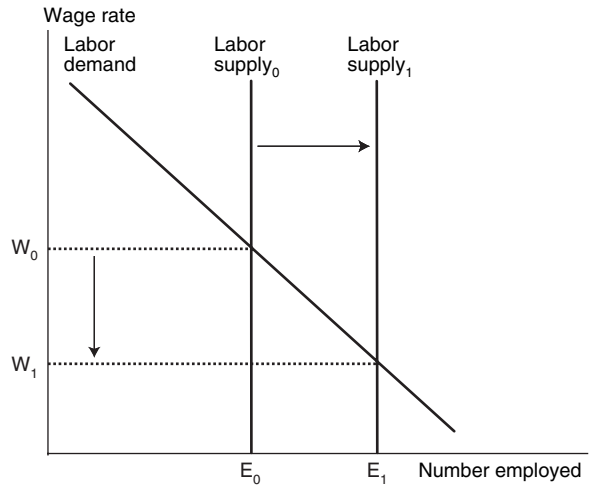


Figure 1e
Change in wages, zero elasticity versus positive elasticity labor supply

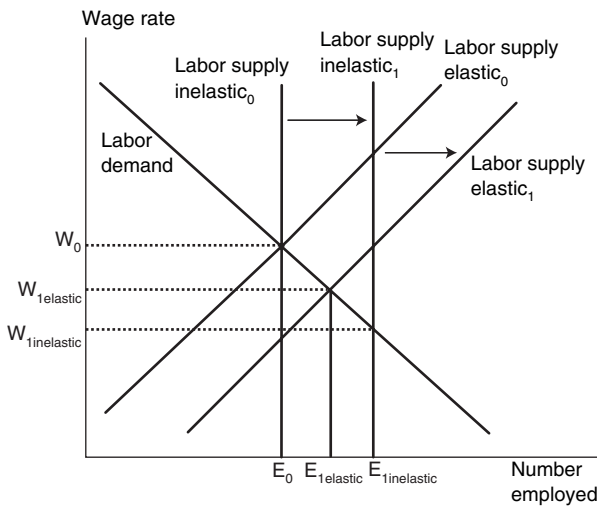


Figure 1f
Increase in labor supply with zero elasticity labor demand

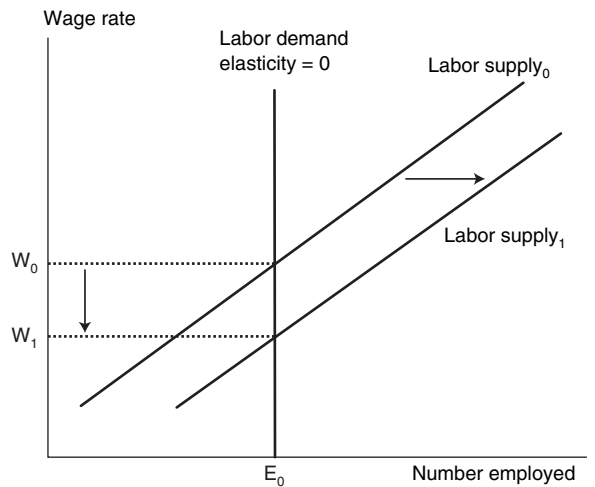


Figure 1g

Change in wages, zero elasticity versus negative elasticity labor demand

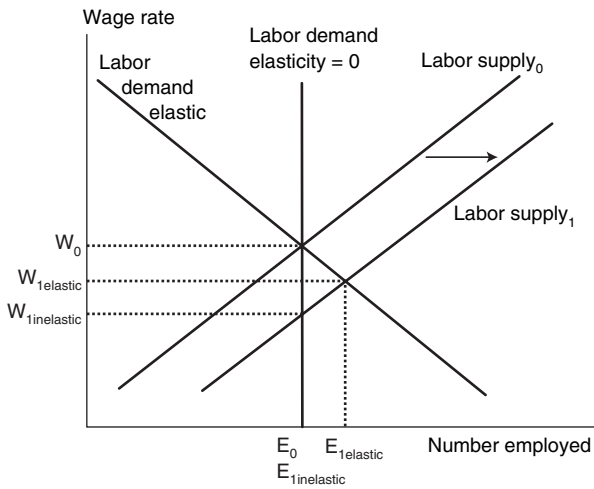


Figure 1h

Increase in labor supply and demand

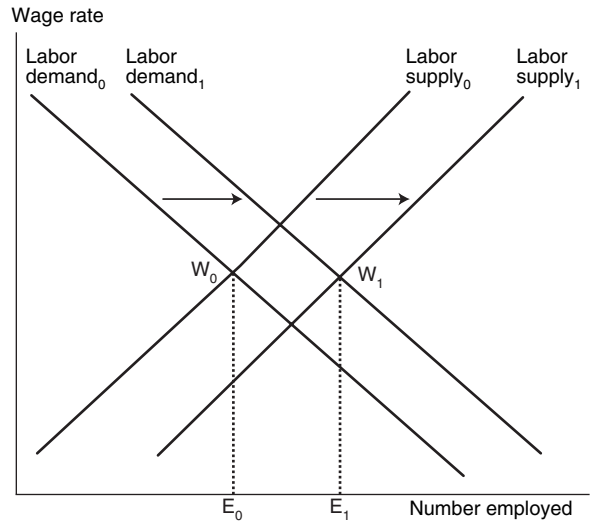


Figure 1i

Increase in labor supply with small increase in labor demand

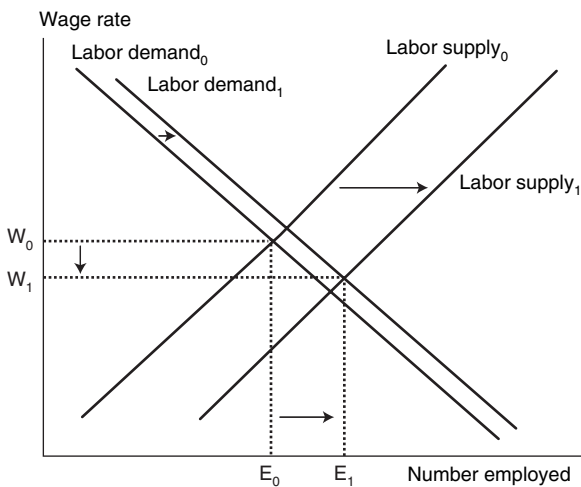
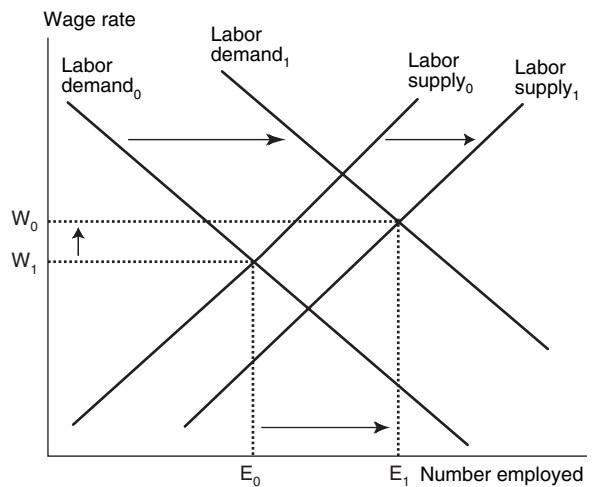


Figure 1j

Increase in labor supply with large increase in labor demand



shifting to the left. As a result of these changes, wages will fall and workers, taking into account their reservation wages, may drop out of the labor force to pursue nonmarket activities, such as education or child rearing, which in turn will decrease labor supply, a shift to the left. Any policy change or other labor market phenomenon is taking place in the context of a dynamic economy and so is in addition to movements in labor demand and labor supply that are already taking place. This is the challenge of estimating the impact of a policy change.

In this dynamic process of an influx of workers during macroeconomic change, several qualitatively different labor market responses are possible. Movements of labor demand due to macroeconomic conditions would either mitigate or exacerbate the impact on the wage rate from the influx of workers. For example, if increases in labor demand due to economic expansion are small, then the influx of workers would result in a decline in wages and a level of

worker displacement that would look similar to analysis that held demand constant (fig. 1i). If the labor market is tight—that is, there is excess demand for labor, or there are more jobs than workers to fill them—displacement and wage impacts will be reduced or not occur from the exogenous increase in labor supply (fig. 1j). Consequently, capturing the impact of an influx of workers in a dynamic economy necessitates estimates not only of the impact of the influx of workers on the labor market, but also of the impact of macroeconomic conditions on the labor market. Labor supply and demand elasticities must be estimated, as well as the magnitude of the demand and supply shifts. None of the models discussed earlier attempt to make this more complex analysis. Our analysis accounts for both the movements of labor supply and labor demand within the context of a changing economy to determine the net effect on the labor market of public assistance recipients moving into the labor force.

Household Impacts

This study also addresses whether or not public assistance recipients moving into the labor force are better off working than receiving transfer payments: That is, do they attain a higher household income and do they rise above the poverty level? Researchers have approached the issue—estimating whether or not earnings replace transfers and public assistance recipients are better off once they leave the program—in several ways. Results are mixed. Some are better off because the earnings that replace welfare transfers raise incomes above the poverty level; others are not because income remains below the poverty level even with the earnings.

One approach has been to calculate expected earnings and transfer program reductions for a typical public assistance recipient. This approach was used by Burtless (1995); McMurrer, Sawhill, and Lerman (1997); Acs et al. (1998); and Ellwood (2000). Generally, they found that, if recipients were to work full-time, their earnings would be enough to raise income above the poverty level. If recipients work only part-time, earnings alone will not be adequate to lift them out of poverty. When earnings from part-time work are combined with Earned Income Tax Credit (EITC), food stamps, Medicaid, and child care subsidies, household income rises to or above the poverty level.

A second approach, used with postwelfare reform survey data, is to evaluate the effectiveness of State welfare programs through the TANF leavers studies.⁷ In a review of these studies, Brauner and Loprest (1999, p. 6) report that “leavers are not earning enough to raise their income far above the poverty level,” and that additional sources of income, such as EITC, Medicaid, food stamps, child care subsidies, and child support are important. The U.S. General Accounting Office (1999) also reviewed the State leaver studies. They found that, when quarterly earnings reported by former welfare recipients are extrapolated to annual earnings, the estimated earnings are greater than the maximum annual amount of cash assistance and food stamps that a three-person family with no other income could have received in these States. However, if these earnings were the only source of income for the families after they left welfare, many of them would remain below the Federal poverty level.

⁷See the website for the U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation: <http://aspe.hhs.gov/hsp/leavers99>.

Schoeni and Blank (2000, p. 6) reported that “few of the TANF Leaver studies explicitly compare post-welfare income with the income they would have received if remaining on public assistance. The scant evidence available in a few States suggests that between one-half and two-thirds report higher incomes post-welfare.” Using the Current Population Survey (CPS) March Supplement 1977-1999, they looked at the impact of welfare reform on key indicators of well-being for all women, both single mothers and married women, grouped by education levels and age groups. They found that family earnings and income rose as a result of the welfare reform changes and that poverty declined. However, the poorest women did not experience the same gains to income as did other recipients under TANF. The earnings of other family members are an important factor in these results, “an issue worth further research” (Schoeni and Blank, 2000, p. 25).

Macroeconomic Conditions

Our second research question looks at how a change in macroeconomic conditions affects labor markets and consequently public assistance under welfare reform. An economic downturn can be characterized by rising unemployment, a reduction in the availability of new jobs for public assistance recipients and layoffs for some of those able to get and keep jobs during the favorable economic circumstances. Economic growth can be characterized by job growth and increases in personal income.

Past research can help us analyze the impact of the phases of the business cycle—recession and expansion—on public assistance recipients. Of particular interest are the effects of a recession because job loss is not uniform across all occupations. Using data from the CPS for 1975-97, Hoynes (2000) found that the effect of a downturn on low-skill jobs is more than three times as great as the effect on higher skilled White men, but the difference in the employment effect is smaller for the 1990-91 recession. Smith and Woodbury (1999) found that employment for minimum wage workers fell from 7.1 million in 1988 to 6.2 million in 1992, while overall job growth was about 4 percent.

Methodology

Scenario analysis with an economywide simulation model provides a method for gaining insight into the labor market outcomes of welfare reform. When evaluating the effects of welfare reform, how to model the labor market is an issue. We chose to use an economywide model that takes into account the change in not only the supply of labor but also the demand for labor. By including all of the economy, we can analyze the direct and indirect effects of a labor supply shift due to changing economic circumstances or policy. By including product markets, the demand for labor is derived as an input into production, and as production changes, so does the demand for labor. By including the industry detail making up the economy, with each industry having its own occupational employment pattern, we are able to be more specific about how changing economic circumstances affect labor demand. In addition, the occupational detail allows us to determine which parts of the labor market are affected.

The purpose of this type of analysis is known in the forecasting literature as scenario analysis. The purpose is “not strictly to predict the future but to facilitate a systematic exploration of ... critical events within some explicit time frame” (Granger, 1989, p. 224). A base set of assumptions is made, which is the “most probable” or “surprise-free” case. Plausible alternative scenarios are compared against the base case. Scenario analysis produces qualitative forecasts, not quantitative, point forecasts.

Because most economic modeling, and time-series modeling in particular, extrapolates past trends into the future, major changes or shifts cannot always be incorporated into the model. Policy changes by their very nature change the environment, and so past trends of behavior under previous policies may not indicate behavior under a new policy. In addition, changing macroeconomic conditions make it difficult to isolate the impact of a policy change. Consequently, scenario analysis is useful in analyzing policy changes, such as how welfare reform will fare in the face of alternative macroeconomic conditions.

A Model for Scenario Analysis

A computable general equilibrium (CGE) model is an economywide computer simulation model that captures, in a stylized manner, the economic interactions among households, producers, and government (Hanson, 2002). Each of these economic entities has multiple roles, and all interact with each other. Households supply labor to producers and consume goods and services using the income they earn. In addition, they receive income from the ownership of capital, receive government transfer payments, save, and pay taxes. Producers make goods and services for the market and use labor inputs, capital stocks, and other goods. The government provides transfers and public services to households and collects tax revenue.

Each of these economic entities may be aggregated at different levels of detail, refining the model’s specification. In this study, we aggregate producers by industry groups using the Input-Output Accounts (U.S. Department of Commerce, Bureau of Economic Analysis, 1997). We segment households into a number of social-economic categories using data

from the Current Population Survey (CPS), March Supplement (U.S. Department of Commerce, Bureau of Census, 1997). The unit of analysis that we label “household” is our best approximation of a “consumption unit” and is not identical with the CPS household defined by a common address. Households are distinguished in a way that allows the scenario analysis with the model to focus on changes in the workforce status of household members who receive public assistance.

For the household aggregation, we use four characteristics (family structure, income, workforce status of primary and secondary earners, and participation in public assistance programs) to segment households into distinct groups (see box, “Four Characteristics Distinguish Household Types”). Not all combinations of household characteristics occur in the data, so the model includes 99 household groups.⁸ The detail in classifying households and labor occupations distinguishes this model from the model in Hanson et al. (2002).

Family Structure. We base the family structure of a household on head-of-household type: single-parent, dual-parent, single-adult, multi-adult, and elderly. A household is categorized as elderly if the household head is age 65 or older. The presence of children is determined by whether any person in the household is under age 18 and not a reference person or spouse in a primary family, nonfamily householder, or unrelated subfamily. All households with children (except elderly headed) are classified as either dual-parent or single-parent households. All households with no children and

⁸We excluded two types of households from the analysis: (1) households in which the head is in the military living on- or off-base, and (2) households in poverty with large negative self-employed income. Most of these households do not participate in government programs and tend to bias the characteristics of low-income household groups.

Four Characteristics Distinguish Household Types

1. Family type
 - Married couple families, with children under 18 years old
 - Married couple families, with no children
 - Single-parent families, with children under 18 years old
 - Other types of families with no children, including single-person families and single-parent families with adult children
 - Elderly families, with the reference person over age 65
2. Income level for each family type
 - Low-income families—income below 130 percent of the poverty threshold
 - Mid-income families—income between the low- and high-income families
 - High-income families—income in the top 25 percent of households
3. Work status of primary and secondary earners in each family type at each level of income
 - Primary earner not working, working part-time, or working full-time
 - Secondary earner not working, working part-time, or working full-time
4. Welfare program participation for low-income families
 - Food Stamp Program plus AFDC participation
 - Food Stamp Program participation only
 - No participation in the Food Stamp Program or AFDC

Source: ERS.

without an elderly head are classified as “multi-adult” if there is more than one adult and “single-adult” if there was only one person.

Income. We break down the five family structure types into three income classes: low income (130 percent of the poverty level), middle income, and high income. The income classes are based on the Federal poverty level for each household, as defined by Census Bureau guidelines.

Workforce Status. We base the work status of both primary and secondary earners for each family structure type at each level of income on whether (1) the primary earner does not work, works part-time, or works full-time, and where appropriate (2) the secondary earner does not work, works part-time, or works full-time.⁹ The primary earner is defined as the household member with the greatest earnings. Though we do not distinguish households by the status or reason for not working, we do keep track of whether the nonworking primary and secondary adults are unemployed or not in the labor force (NILF), and for NILF, we distinguish the reasons as retired, disabled, and other.

Program Participation. We determine three possibilities for household participation in the FSP and the AFDC-TANF programs of public assistance: (1) participate in the FSP only; (2) participate in the FSP plus AFDC-TANF; and (3) no participation in the FSP or AFDC-TANF. The few households that participate in AFDC-TANF but not the FSP are treated as if they participate in both programs. Households are not further distinguished by their participation in other public assistance programs, but the cash and cash value of in-kind benefits from these other programs are included in the household’s income.

Households receive income from both the private sector and the government (see box, “Sources of Household Income”). The sources of income include earnings from wages, salaries, and self-employment; capital income from the ownership of assets (dividends, interest, and rent); and transfer income from government programs, including programs of public assistance for low-income households. In addition to food stamps and AFDC-TANF, cash and the cash value of in-kind benefits from other programs are treated as sources of income. Households use their income to consume goods and services, pay taxes, and save. Household expenditure shares are derived from the 1996 Current Expenditure Survey (CES) (U.S. Department of Labor, Bureau of Labor Statistics, 1997). Savings and taxes are specified as fixed saving rates and tax rates specific to each household group. An average tax rate is derived from National Economic Accounts, while tax rate differentials by household group are derived from the CPS March Supplement. Similarly, an average savings rate is derived from National Economic Accounts, while savings rate differentials by household group are derived from the Federal Reserve, Survey of Consumer Finances, as presented in Bosworth, Burtless, and Sabelhaus (1991).

We also treat labor supply and demand in detail. Using CPS data, we categorize into skill levels the mix of occupations that the primary and secondary earner of each household type supplies to the labor force. Similarly, we categorize the occupational mix of labor that each industry demands using data from the U.S. Department of Labor, Occupational Employment Statistics. For both labor supply and demand, we grouped

⁹To simplify the modeling of households, we excluded work force status and earnings of additional (more than two) adults in a household.

Sources of Household Income

Private sector of the economy:

1. Earnings or labor-related income:
 - Money wages and salaries, before deduction for taxes, pensions, union dues
 - Net income from self-employment, farm and nonfarm
2. Capital-related income:
 - Interest and dividends
 - Rents and royalties
 - Periodic payments from estate or trust funds
3. Retirement income (annuities or pensions not counted above)
 - Federal employee
 - State and local employee
 - Private funds
4. Inter-household transfers:
 - Child support
 - Alimony
 - Financial assistance (periodic payments; excludes gifts, loans, or sporadic assistance)

Government transfers counted in money income:

5. Social insurance fund plus veterans benefits (less medical and government employee retirement):
 - Workers compensation
 - Social Security income
 - Survivor's income
 - Disability income
 - Veterans administration benefits
6. Unemployment insurance
7. Supplemental Security Income (SSI)
8. Public assistance
 - Cash benefits from Temporary Assistance for Needy Families (TANF)
 - Cash benefits from General Assistance

Private sector and government sources:

9. Other periodic income (such as foster care, military family allotments, and foreign government pensions)

Cash benefits from government assistance programs:

10. Earned income tax credit (EITC)
11. Energy assistance
12. Education assistance (Pell grants, government education assistance, scholarships or grants, and financial assistance from employers, friends and family outside the home)

Noncash benefits from government assistance programs, included in the CPS:

13. Medicare
14. Medicaid
15. Food stamps
16. School lunch and breakfast
17. Housing assistance

Source: U.S. Department of Commerce, Census Bureau, Current Population Survey (1997).

occupations into the 11 education and training categories developed by the U.S. Department of Labor (Wash, 1995-96) and used in the occupational employment projections (U.S. Department of Labor, Bureau of Labor Statistics, 1998; Hecker, 2001). The occupational categories are listed in the box titled "Labor Occupations by Education and Training Categories."

Clearly, as consumers, producers, and government interact, a rather complicated economic process is taking place, involving the creation or loss of jobs as well as the production and consumption of goods and services. A CGE model captures this economic process and provides a way to examine how shocks, such as changes in policy, affect the economy. A CGE model captures the linkages among economic entities and thus can isolate and trace the impacts from a shock through the economy.

One major contribution of a CGE model is its comprehensive look at the impact of policy change on the economy, as it works through the various linkages among the economic entities. In the case of welfare reform, the policy of interest is the shift from AFDC to TANF and the impact it may have on the labor market. This policy change entails recipients shifting from welfare to work, whereby transfer payments decrease and labor market participation increases. The initial impact is reduced government spending on low-income families and increased labor supply for low-skill jobs. The reduction in government expenditure is assumed to be offset by a decrease in personal income taxes. The assumed tax reduction maintains a budget-neutral policy change, which is standard in analysis of tax incidence. The CGE model can trace changes in household labor force participation through the labor market to industry demand for labor and back to households through earnings. Other households are also affected as labor markets adjust to absorb the new labor supply. Each direct effect of a policy change creates its own set of ripple effects, captured by the CGE model. The power of the model is in capturing the linkages among the different economic entities of the economy.

The database underlying a CGE model consists of a Social Accounting Matrix (SAM), quantity measures for factors of production (labor, capital, and land), and elasticity parameters. For this analysis, we are using a 1996 SAM developed and maintained at USDA-ERS. We have chosen 1996 as our base year for policy analysis because it is the last year before welfare reform and the year for which all data were available at the start of this project.

Simulating a policy change in our CGE model is an exercise in comparative statics, a what-if comparison of two equilibrium states of the economy. The results of comparative static analysis are in terms of changes in economic activity when the economy moves from the base equilibrium with the existing policies in place to a new equilibrium with the policy changes. The length of the period to a new equilibrium depends on assumptions about price-quantity responsiveness (elasticities) and aggregate supply of capital. The new equilibrium is characterized by prices, which equate supply and demand in markets for goods and services, and satisfy the model closure rules. A CGE model describes the new equilibrium and not the adjustment process.

All of our analysis is aggregated at the national level. Consequently, we neither disaggregate the labor force by State nor consider the variation in State welfare policies.

Assumptions

Several key assumptions are made to perform this analysis. First, an estimate must be made of the size of the influx of new workers into the labor force. Second, labor demand must be specified. Third, the relevant labor market or markets must be identified. Fourth, the relationship between the unemployment rate and public assistance caseloads must be examined. These assumptions are discussed here.

Influx of New Workers

A review of the literature indicates that estimates of the expected increase in labor supply from welfare reform range from 1 million to 3 million workers. The approach used to estimate the potential number of new workers varies across studies, but all were made before welfare reform and, consequently, rely on prewelfare reform data.

Labor Occupations by Education and Training Categories

Postsecondary Awards

- Professional degree (for example, law, medicine, dentistry, and clergy)
- Doctoral degree
- Master's degree
- Work experience plus bachelor's or higher degree (mostly managerial occupations that require experience in a related nonmanagerial occupation)
- Bachelor's degree
- Associate's degree
- Postsecondary vocational training (these occupations require a training program and may also require a licensing exam)

Work-Related Training

- Work experience in a related occupation (some occupations are supervisory or managerial occupations, but also others require skills and experience gained in other occupations such as police detectives, who are selected based on their experience as police patrol officers)
- Long-term on-the-job training (occupations that usually require more than 12 months of on-the-job training or combined work experience and formal classroom instruction before workers develop the skills needed for average job performance, such as electrician, bricklayer, and machinist, that normally require apprenticeships lasting up to 4 years)
- Moderate-term on-the-job training (workers can achieve average job performance after 1 to 12 months of combined job experience and informal training, such as dental assistants, drywall installers and finishers, and machine operators)
- Short-term on-the-job training (workers usually can achieve average job performance in just a few days or weeks, such as cashier, bank teller, and messenger)

Source: U.S. Department of Labor, Bureau of Labor Statistics.

Burtless (1998, revised in 2000) estimated that the PRWORA work requirements would affect between 2.5 million and 3 million adults on welfare. He calculated the number of new workers as 83 percent of the 1996 caseload for the single-adult households in the program, plus 2 times 8 percent of the caseload for the two-adult households.¹⁰ This sum is reduced by 20 percent for those households exempt from the work requirements due to disability or other hardship. The resulting estimate is 3 million new workers. His lower estimate of 2.5 million results from an additional adjustment for the program recipients who are already working.

¹⁰The remaining 9 percent of the caseload are child-only cases with no labor supply impact.

McMurrer, Sawhill, and Lerman (1997) estimated that welfare reform would add over 800,000 new workers between 1997 and 2002, or roughly 140,000 per year. Their estimate is derived from the requirements for participation in work activities that increase each year to 50 percent by 2002 for single adult families. Bartik (2000) estimates between 1 million and 1.4 million new workers between 1993 and 2005, and uses 1.4 million in his analysis of the labor market impacts. He assumes that, for every single adult family that leaves welfare, the labor supply increases by 0.47—an assumed 60 percent labor force participation rate of welfare leavers minus 13 percent labor force participation rate for single mothers on welfare. Mishel and Schmitt (1995) used an estimate of 1 million by 2000. Holzer (1996) used an estimate of 2 million—half the 4 million to 5 million caseload required to be working by 2002.

The studies above developed *ex ante* estimates of the influx of workers. In appendix A, we develop an *ex post* estimate of the influx of workers from the reduction in public assistance caseload using administrative data on public assistance caseload from 1996-2000. Our estimate of 2.4 million new workers from 1996 through 2000 is well within the range of estimates in the literature, of 1 million to 3 million.

Labor Demand

Labor demand is derived demand and a result of demand for goods and services. Labor demand is derived from the production function, which in our model is a constant elasticity of substitution (CES) industry production function. Given our assumption about the elasticity of substitution—a CES elasticity of substitution of 1.1 for nonagricultural sectors and 0.5 for the agricultural sectors—and labor's share of value added, constant-output labor demand elasticity by industry ranges from -0.15 to -0.92, with an average elasticity of -0.27. These values represent inelastic demand for labor. They are consistent with others' estimates and are within the range found by Hamermesh in his survey of labor demand elasticities (Hamermesh, 1993, p. 92).

Total labor demanded in each industry's production function is an aggregate of the demand by occupation. In our model, total labor demand is a CES aggregation of occupations, with an elasticity of substitution of 0.5. The constant output labor demand elasticity for low-skilled occupations (see below for definition of low skill) ranges between -0.25 to -0.5 across industries, depending on the occupation's share of the industry's labor.

Relevant Labor Markets

An increase in the labor force of 2.4-million workers from a reduction in public assistance caseload is small relative to an average total employment

of 130 million during 1996 to 2000. Such a small change in labor supply (2 percent) could be expected to have a negligible impact on wages. However, public assistance recipients would be expected to be concentrated in the low-skill labor market (Burtless, 1995; Bernstein and Hartmann, 1999; Acs and Loprest, 2001; Brauner and Loprest, 1999; Loprest, 1999). Consequently, their entry into the labor force could have a large impact. Identifying the jobs that public assistance recipients enter is important in analyzing the impact of welfare-to-work.

How the relevant labor market is defined varies by study, and as a result, findings differ. The literature analyzing skill levels is voluminous, so only a few examples will be mentioned here. Burtless (1995) found that, “[a]mong women in their mid-twenties who are most dependent on AFDC, roughly half have not completed high school.” In addition, “less than one out of eight has received any schooling beyond high school” (p. 71). He concluded that, “the low educational attainment and poor test scores of welfare-dependent mothers severely restrict the kinds of jobs most of them can obtain.” (p. 78).

However, education level is not the only, or the appropriate, instrument for characterizing skill when looking at both the supply and demand of labor. In a survey of small business owners, Levin-Waldman (1999) found that the main skills they required for entry-level jobs are general experience, specialized experience, clerical, computer and technical, and ability to deal with people. Having a high school diploma is not a specific skill characteristic required by employers of potential entry-level employees. Employers typically will use education levels as a screen for potential employees in a soft labor market, but lower or eliminate the education thresholds in a tight labor market. Education levels, especially for less than a college degree, are then not a job requirement but may be used as a screening device depending on economic conditions.

Burtless (1998) defined the low-skill labor market as consisting of the short-term on-the-job training occupations, as classified by the education and training categories of occupations (see box “Labor Occupations by Education and Training Categories”). There were 54 million such workers in 1996, according to Burtless. Lerman and Ratcliffe (2001), in their discussion of how well urban labor markets can absorb recipients of public assistance, defined the low-skill labor market as the share of jobs in short- and medium-term on-the-job training occupations that are held by workers with a high school diploma or less. Bartik (2000) considers two definitions of the low-skill labor market defined as female head of household with less than college education, and with less than a high school degree. His estimate of a 1.4 million-worker increase in labor supply is about 3 percent of the female labor force with less than a college education and 9 percent of the female high school dropouts. Holzer (1996) uses high school dropouts plus the bottom quintile of high school graduates for 28 million workers. Mishel and Schmitt (1995) use the lowest 30 percent of wage earners for 31 million workers. Alternative definitions of the relevant labor market results in a workforce of 30 million to 54 million workers, so a 1 million- to 3 million-worker change to the labor supply would result in a 3 percent to 10 percent impact.

We use skill level instead of education in identifying and defining the relevant labor markets for welfare recipients. In classifying skill level, we use the education and training occupational categories developed by the Office of Employment Projections, Bureau of Labor Statistics, U.S. Department of Labor (see box “Labor Occupations by Education and Training Categories”). Occupations are classified into 1 of 11 categories that describe the education and training needed by most workers to become fully qualified.

The three lowest skill levels of the education and training categories are long-term on-the-job training (OJT), moderate-term OJT, and short-term OJT. Occupations in these three categories are considered entry-level jobs, as they do not require formal training or experience for hiring. Long-term OJT occupations usually require more than 12 months of on-the-job training or combined work experience and formal classroom instruction before workers develop the skills needed for average job performance. Examples are electrician, bricklayer, and machinist, which normally require apprenticeships lasting up to 4 years. In moderate-term OJT occupations, workers can achieve average job performance after 1 to 12 months of combined job experience and informal training, such as dental assistants, drywall installers and finishers, and machine operators. Short-term OJT occupations are those where workers usually can achieve average job performance in just a few days or weeks, such as cashier, bank teller, and messenger. Of particular interest is the short-term OJT category, as its skill requirements are the lowest of all the categories. We consider these short-term OJT occupations as low-skill.

Short-term OJT occupations were 39 percent (55 million jobs) of total employment in 1998 while all entry-level jobs were 63.4 percent of total employment, with total employment at 140 million jobs. Much of the employment growth from 1996 through 2000 was at entry-level occupations, 3 million per year. About 20 percent of that entry-level job growth can be attributed to public assistance recipients moving into the labor force.¹¹ (See appendix A for more discussion.)

Methodology Summary

By using an economywide CGE model, we can capture the labor market impacts from a change in public assistance caseload that enters the labor force. By developing the labor market component of the model we created a richness of detail about skill levels that makes this CGE model unique and relevant to analyzing labor market impacts of welfare reform. We build on others’ research by using their findings as key assumptions in the model.

¹¹Due to changes in the detailed classification of occupations between 1996 and 2000, it is not possible to compare the job growth for low-skilled occupations, while the change in entry-level jobs is comparable.

Scenarios and Results

We analyze the economywide impacts for three scenarios:

- (1) Increase in labor supply from public assistance recipients joining the labor force;
- (2) Recession; and
- (3) Economic growth.

The macroeconomic assumptions that accompany each scenario are presented in table 1. Each scenario focuses on the low-skill and other entry-level labor markets. Base data for households, industry, and labor occupations, from which simulation results can be compared, are presented in tables 2-4.

Increase in Labor Supply from Welfare-to-Work

Between 1996 and 2000, the caseload for AFDC-TANF and the FSP fell, with many leavers entering the labor force. We use a CGE model to explore the potential magnitude of the labor market impacts of the reduction in public assistance caseload and the move into the labor force. Our simulation experiments provide a qualitative finding of whether the labor market impacts are large or small. Using simulation analysis is especially useful in studying the impact of a policy change because policy changes happen in a dynamic economy without the ability to do a controlled experiment. The simulation also allows us to isolate the impacts of the policy change.

For our scenario analysis with the CGE simulation model, we assume an exogenous increase to the labor supply by moving into the labor force some of the nonworking adults of low-income households who are receiving public assistance from AFDC-TANF and/or the FSP. We assess the labor market impact from the influx of low-skill workers while allowing aggregate capital stocks to expand and keeping the rate of return to capital at the rate in the base.¹² We assume that those who leave the programs and take a job take a full-time job and lose all of their program benefits from food stamps, AFDC-TANF, and any unemployment insurance. We further assume

¹²With fixed aggregate capital, the low-skill wage impacts are larger by 8 percent. With capital stocks fixed by sector of production, the low-skill wage impacts are larger by 13 percent.

Table 1—Macroeconomic assumptions used in scenarios

Assumptions	Scenario			
	Labor supply welfare reform 1a and 1b 2a and 2b	1996-2000 growth 1c and 1d	Average recession 3	Trend growth, 1957-2000 4
	<i>Average annual percent change</i>			
Growth rates for:				
Real GDP	1.6	4.1	-1.9	3.4
Real fixed investment	0	9.1	-14.4	4.6
Real exports	1.4	6.8	1.5	6.5
Real imports	1.3	12.4	-7.6	6.9
Real capital stocks	1.9	3.3	-2.0	3.1
Employment	1.8	2.3	-1.3	2.1
Nominal exchange rate	0	5.4	10.0	5.4

Source: ERS tabulations of data from U.S. Department of Commerce, Bureau of Economic Analysis.

that other program benefits, such as the earned income tax credit (EITC) and child care, do not adjust.¹³

We develop two sets of two scenarios, for sensitivity analysis purposes. First, we distinguish scenarios by the number of public assistance recipients entering the labor force. In one set of scenarios, we assume that the labor supply increases by 2.4 million people who leave AFDC-TANF and/or the FSP and enter the labor force between 1996 and 2000 (see appendix A). This scenario assumes that 70 percent of those leaving AFDC-TANF take a job. In a second set of scenarios, we assume that 50 percent of those leaving AFDC-TANF take a job, which results in a 2-million-worker increase in the labor supply. These two estimates of AFDC-TANF leavers taking jobs are high and low estimates. By using both assumptions, we can get a sense of the range of the impact.

Second, we distinguish the types of occupations taken by public assistance recipients entering the labor force. For each of the scenarios characterized by the total change in labor supply, we first assume that all the new

¹³The full loss of AFDC and food stamps overstates the loss of transfer income, and the absence of any adjustment to EITC and other programs, such as child care and Medicaid, understates any increases in program transfers. The assumption of taking a full-time job overstates the increased earnings for some workers who will take part-time jobs. We do not take into account any work-related expenses, such as commuting or child care costs.

Table 2—Household characteristics, 1996 base values

Characteristic	Consumer units	Food stamp benefits	Other government transfers	Income tax	Labor supply	Labor income	Net income ¹
	<i>Thousands</i>	-----\$ billions-----			<i>Million people</i>	-----\$ billions-----	
Total households	108,828	21.9	1,020.1	886.9	131.4	3,994.5	5,447.4
By income group:							
Low-income	23,321	21.9	204.0	1.8	14.9	96.2	322.9
Welfare, no work	3,840	10.9	60.9	0	0	0	71.8
Welfare, with work	3,518	11.0	52.2	0.4	3.7	24.4	87.2
Nonwelfare, working and not working	15,963	0	91.0	1.5	11.2	71.7	164.0
Mid-income	58,090	0	507.6	213.4	51.8	1,624.1	1,986.7
High-income	27,418	0	308.5	671.7	64.7	2,274.3	3,137.8
By family type:							
Single-parent	10,633	13.2	94.3	26.6	9.2	207.2	317.6
Low-income	5,454	13.2	65.7	.3	3.4	27.1	105.6
Welfare, no work	1,494	6.5	26.4	0	0	0	32.9
Welfare, with work	1,844	6.7	29.6	.1	1.4	11.1	47.1
Nonwelfare, working and not working	2,116	0	9.8	.2	2.0	16.0	25.6
Mid-income	2,552	0	15.0	3.4	1.7	50.0	61.8
High-income	2,628	0	13.5	22.8	4.1	130.0	150.2
Other family types	98,195	8.7	925.8	860.3	122.2	3,787.4	5,129.8
Low-income	17,867	8.7	138.3	1.5	11.5	69.1	217.3
Welfare, no work	2,346	4.3	34.5	0	0	0	38.8
Welfare, with work	1,675	4.4	22.6	.2	2.3	13.4	40.1
Nonwelfare, working and not working	13,847	0	81.2	1.3	9.2	55.7	138.4
Mid-income	55,538	0	492.6	210.0	50.2	1,574.1	1,924.9
High-income	24,790	0	294.9	648.8	60.6	2,144.2	2,987.6

¹Net income is personal income less income tax and is equal to earnings, capital income plus transfers, or consumption plus savings. Source: ERS.

workers take low-skill jobs in the short-term OJT occupation. This somewhat extreme assumption produces pronounced results that allow us to easily trace the impact of the influx of recipients through the economy. Second, we make a more realistic assumption that the new workers take jobs distributed by occupation in proportion to the distribution of occupations held by working adults of other low-income households. In this scenario, the low-skill short-term OJT occupation accounts for 56 percent of the jobs, entry-level jobs account for 80 percent (including the short-term OJT jobs), and the other 20 percent involve some work experience and post-high school education.

Table 3—Aggregate conditions by sector, 1996 base values

Employment sector	Labor	Production	Exports	Imports	Income
	<i>Millions jobs</i>	<i>1996 \$ billions</i>	<i>-----\$ billions-----</i>		
Farm	2.320	237.0	20.3	5.6	97.5
Construction	7.860	857.8	.1	0	389.5
Food processing	1.717	442.1	25.7	23.3	124.8
Energy	1.405	627.5	11.5	81.6	228.9
Trade and transportation	23.566	1,843.4	139.6	9.1	965.7
Tobacco and alcohol	.130	79.2	9.4	5.6	33.3
Textile and apparel	1.971	197.7	22.8	69.9	67.7
Other nondurable manufacturing	5.162	919.2	90.7	89.0	396.7
Durable manufacturing	11.214	1,902.4	373.0	539.8	742.6
FIRE ¹	9.293	2,371.5	58.4	1.8	1,374.5
Restaurants	7.725	311.4	15.5	0	131.4
Health	9.780	688.4	1.5	0	449.0
Education	2.008	98.9	11.2	.6	56.9
Other services	47.254	2,709.0	50.6	4.5	1,977.8
Total	131.405	13,285.6	830.4	830.8	7,036.3

¹FIRE refers to the finance, insurance, and real estate sector.

Source: ERS.

**Table 4—Aggregate labor market by worker skill level,
1996 base values**

Skill level	Labor supply	Labor wage
	<i>Thousand jobs</i>	<i>\$/year</i>
Total labor	131,405	30,407
By occupational group:		
Professional degree	1,728	96,587
Doctoral degree	329	39,970
Master's degree	895	33,524
Work experience plus bachelor's or higher degree	9,375	57,270
Bachelor's degree	14,337	45,179
Associate's degree	4,000	38,848
Post-secondary vocational training	8,359	25,907
Work experience in a related occupation	10,227	32,513
Long-term on-the-job training	14,594	31,426
Moderate-term on-the-job training	17,432	29,460
Short-term on-the-job training	50,129	18,439

Source: ERS.

Our scenarios are labeled as follows:

- 1a = Labor supply increases by 2.4 million workers, who all take short-term OJT jobs.
- 1b = Labor supply increases by 2.4 million workers, and the distribution of jobs new workers take is the same as the distribution of jobs held by working adults of other low-income households.
- 2a = Labor supply increases by 2.0 million workers, who all take short-term OJT jobs.
- 2b = Labor supply increases by 2.0 million workers, and the distribution of jobs new workers take is the same as the distribution of jobs held by working adults of other low-income households.

In addition, we extended analysis of scenario 1b to include macroeconomic conditions of 1996-2000:

- 1c = Macroeconomic growth of 1996-2000, with a labor supply increase of 13.2 million workers, which includes the 2.4 million labor supply increase from public assistance recipients moving into the labor force with a distribution of occupations as in 1b.
- 1d = Macroeconomic growth of 1996-2000, without the labor supply increase from public assistance recipients (for comparison with 1c).

Our analysis focuses on the wage impacts of low-skill workers entering the labor force. We assume those already working do not adjust their labor supply in response to the wage adjustment that arises from the labor supply influx (zero labor supply elasticity—perfectly inelastic). Given our assessment that the labor supply of low-skill workers is inelastic, making the assumption of a perfectly inelastic labor supply curve will not affect the results much. Our analysis assesses the wage adjustments necessary for firm demand to absorb the new labor supply while also allowing firms to adjust their capital stocks.

Scenario 1a

With 2.4 million new workers taking low-skill jobs in short-term OJT occupations, the labor supply for this occupational group increases by 4.8 percent, from 50.1 to 52.5 million workers. As firms expand capacity by 1.4 percent and the economy adjusts to totally absorb the new labor supply, low-skill wages fall by 7.2 percent (table 5, first 2 columns and fig. 1i). This wage impact is within the range of estimates in the literature discussed earlier, making it consistent with others' findings. Wages for the other occupations rise from 1.6 percent to 4.1 percent because these workers are now relatively scarce as the economy expands. The inelastic labor demand for the occupations is an important influence on the wage impact relative to the given labor supply shock.

In addition to assessing and comparing the labor market impact from the scenarios, we also assess and compare the impact on households. The change in real net income is a monetary measure summarizing the change to household well-being. From the income side, it equals earnings, returns to the

ownership of capital assets, and transfers, but net of personal income taxes. From the expenditure side, it equals personal consumption plus savings.¹⁴

We assess the impact on low-income households that were receiving public assistance and moved into jobs and compare it with the impact on other low-income households who were already working, and with the impact on mid- and high-income households. For those who move from public assistance into jobs, the change to real net income is the net outcome of a reduction in transfer income and an increase in earnings. The net outcome is, therefore, indeterminate. For the other low-income households those who are not public assistance recipients—real net income falls as wage adjustments reduce earnings. They compete for the same low-skill jobs as the new job entrants.¹⁵

For the mid- and high-income households, real net income increases from a reduction in taxes, an increase in earnings, and an increase in returns to capital. Personal income taxes are reduced to offset the reduction in public

¹⁴Adjusting the nominal change in net income for price changes creates the real net income measure. Price changes are small and have little impact on the results.

¹⁵Adjusting the nominal change in net income for price changes creates the real net income measure. Price changes are small and have little impact on the results.

Table 5—Labor market results from moving program recipients to work

Occupational group	Scenario 1a, change in:		Scenario 1b, change in:		Scenario 1c, change in:		Scenario 1d, change in:	
	Labor supply	Wage	Labor supply	Wage	Labor supply	Wage	Labor supply	Wage
	<i>Thousands</i>	<i>Percent</i>	<i>Thousands</i>	<i>Percent</i>	<i>Thousands</i>	<i>Percent</i>	<i>Thousands</i>	<i>Percent</i>
Total labor	2,400	-0.1	2,400.0	0.0	13,202	13.5	10,791	14.2
By occupational group:								
1 Professional degree	0	4.0	3.9	4.7	32	17.5	28	14.2
2 Doctoral degree	0	2.1	5.4	-6	11	11.3	5	13.1
3 Master's degree	0	2.2	0	2.8	14	19.5	14	17.5
4 Work experience plus bachelor's degree	0	2.1	41.2	2.1	193	16.7	151	15.2
5 Bachelor's degree	0	2.2	88.9	1.6	321	19.3	231	18.3
6 Associate's degree	0	4.1	18.7	4.4	83	18.2	64	15.6
7 Postsecondary vocational training	0	2.6	111.7	.9	248	14.4	135	14.6
8 Work experience in a related occupation	0	1.7	217.8	-1.6	386	13.8	165	16.4
9 Long-term OJT training	0	1.6	178.7	-4	1,936	16.9	1,736	18.0
10 Moderate-term OJT training	0	2.1	378.0	-1.5	2,497	10.9	2,074	13.4
11 Short-term OJT training	2,400	-7.2	1,355.7	-2.3	7,481	4.4	6,189	6.9
By aggregate occupation groups:								
High-skill groups (1-3)	0	3.2	9.0	3.5	57	17.4	48	15.1
Mid-skill groups (4-8)	0	2.3	478.0	1.1	1,231	16.6	745	16.4
Entry level (9-11)	2,400	-3.7	1,912.0	-1.8	11,914	8.0	9,999	10.3

Scenarios:

1a = Labor supply increases by 2.4 million persons, and all new workers take short-term OJT jobs.

1b = Labor supply increases by 2.4 million persons, and the distribution of jobs new workers take is the same as the distribution of other low-income households.

1c = Macroeconomic growth of 1996-2000, with a labor supply increase of 13.2 million persons. Included in the labor supply increase are 2.4 million welfare recipients moving into the labor force in the same distribution of occupations as other low-income households (as in 1b).

1d = The macroeconomic growth of 1996-2000, without the labor supply increase from welfare recipients (for comparison with 1c).

OJT = On the job.

Source: ERS simulation analysis.

assistance expenditures and maintain budget neutrality for the policy change. Earnings increase for these households because their members work in high-skill jobs for which wages increase. The returns to capital increase as the use of capital increases in the expanding economy.

In scenario 1a, with all new jobs in the low-skill, short-term OJT occupations, real net income (table 6) falls by \$1.7 billion for the low-income households receiving public assistance with no working members but assumed to take a job and lose their benefits. This translates into an average loss of \$450 per household. Earned income does not compensate for the loss of \$20.4 billion of government transfers (\$7 billion of FSP benefits and \$13.4 billion of AFDC-TANF and unemployment insurance). For the other low-income households—the welfare-with-work households and the households not receiving public assistance—earned income falls by \$2.4 billion (-\$0.6 billion to -\$1.8 billion), as the increased supply of low-skill labor lowers wages, and their real net income falls by \$1.8 billion (-\$0.4 billion to -\$1.4 billion). However, the mid- and high-income households have large gains in real net income (\$102 billion altogether, or \$1,000 per household). Looking at the household subgroups, low-income single parents who move

Table 6—Household results from moving welfare recipients to jobs in short-term on the job training, Scenario 1a

Household scenario	Consumer units ¹	Change in:					
		Food stamp benefits	Other government transfers	Income tax	Labor supply	Labor income	Net income
	<i>Thousands</i>	<i>-----\$ billion-----</i>			<i>Thousands</i>	<i>-----\$ billion-----</i>	
Total households	108,828	-7.0	-13.4	-4.1	2,400	28.5	98.5
By income group:							
Low-income	23,321	-7.0	-13.4	0	2,400	16.2	-3.5
Welfare, no work	3,840	-7.0	-13.4	0	2,400	18.6	-1.7
Welfare, with work	3,518	0	0	0	0	-.6	-.4
Nonwelfare, working and not working	15,963	0	0	0	0	-1.8	-1.4
Mid-income	58,090	0	0	-3.7	0	5.4	14.5
High-income	27,418	0	0	-0.4	0	6.9	87.5
By family type:							
Single-parent	10,633	-4.7	-9.8	-0.4	1,491	10.6	-1.4
Low-income	5,454	-4.7	-9.8	0	1,491	11.0	-3.4
Welfare, no work	1,494	-4.7	-9.8	0	1,491	11.9	-2.6
Welfare, with work	1,844	0	0	0	0	-.4	-.3
Nonwelfare, working and not working	2,116	0	0	0	0	-.5	-.5
Mid-income	2,552	0	0	-0.1	0	-.1	0
High-income	2,628	0	0	-0.3	0	-.3	2.0
Other family types	98,195	-2.3	-3.6	-3.7	909	17.9	99.9
Low-income	17,867	-2.3	-3.6	0	909	5.2	-.1
Welfare, no work	2,346	-2.3	-3.6	0	909	6.7	.9
Welfare, with work	1,675	0	0	0	0	-.2	-.1
Nonwelfare, working and not working	13,847	0	0	0	0	-1.3	-.9
Mid-income	55,538	0	0	-3.6	0	5.5	14.5
High-income	24,790	0	0	-0.1	0	7.2	85.5

¹The number of consumer units by household type are base values and do not change in the scenario. Source: ERS simulation analysis.

from public assistance to work receive the largest reduction in real net income (\$2.6 billion, or \$1,740 per household) as increased earnings fail to offset the reduction in transfers. These results occur under the assumption of full-time employment but with no other adjustment of transfers.

Scenario 1b

When the new workers take a mix of occupations, similar to the occupations held by adults of low-income households that already work, the labor market impacts are considerably different (see table 5). In this scenario, the labor supply for short-term OJT occupations expand by 2.7 percent, 50.1 to 51.5 million workers, and wages fall by 2.3 percent (see fig. 1i). The wages for the other entry-level jobs, moderate-term OJT and long-term OJT occupations, also fall as labor supply increases. In addition, wages in the work experience in a related occupation category also decline, which is as expected because these occupations are tied to the three entry-level occupational groups.¹⁶ Wages for non-entry-level jobs rise due to their relative scarcity in an expanding economy. Wages adjust less in this scenario as the new workers are spread over a broader range of occupations and skill levels.

Comparing the wage adjustment of scenario 1b with that of 1a, we see a much larger wage adjustment in 1a of -7.2 versus a wage adjustment of -2.3 in 1b. The large difference in these two adjustments is because of the inelastic demand for low-skilled workers. The steep demand curve results in a relatively large wage change for a given supply shift.

Overall, the economy expands more than in the previous scenario, with real GDP growing by 1.6 percent and capital stocks expanding by 2.2 percent as a result of the increase in labor supply (table 7). Comparing the impacts of the two scenarios, 1a and 1b, indicates that economywide returns go to the new welfare-to-work workers who have a range of skills, which allows them to work a greater variety of occupations. This result suggests that effective education and training programs (i.e., those that stimulate job entry in a mix of occupations) for low-skilled adults could benefit not only the individuals but the overall economy as well.

The impact on household real net income improves and even switches sign for those who move from public assistance to work, when the jobs taken are distributed over all occupations in proportion to the occupations worked by similar low-income households who already work. Real net income increases by \$2.6 billion (\$700 per household) for the low-income households who leave public assistance to take a job and who lose their benefits (table 7). On average, for all households in this group, earned income increases enough to compensate for the reduction of \$20.4 billion of government transfers. This switch in results, from a change in net income of -\$1.7 billion in scenario 1a to a change of \$2.6 billion in scenario 1b, illustrates the importance of skill level of job entry. Even single parents who move from public assistance to work break even with earnings offsetting lost transfers. The impacts for all the other households remain similar to those in the previous scenario, but the negative impact is mitigated so the losses are smaller and the gains are larger. For the other low-income households—those working and not receiving public assistance—the reduction in earnings is only half those in the previous scenario. Real net income for the mid- and high-income households increases by 33 percent compared with the previous scenario.

¹⁶The doctoral degree occupational group has an abnormal result of falling wages for a high-skill occupation. Because some low-income households have a member with a doctoral degree, the labor supply of this group is increased, along with other low-income households. We suspect that this is a result of first, small cell size, second, postdoctoral programs, and third, low-paying, high-skill jobs with amenities or other benefits, such as flexible hours.

Scenarios 1c and 1d

The above scenarios allow us to isolate the welfare-to-work policy change from the other changes in the economy that occurred over 1996-2000. As we now know, 1991-2001 was the longest economic expansion on record, and the second half of that period was remarkable in generating economic growth. The high growth of the late 1990s was fueled by large productivity increases, which are usually not seen in the latter half of an expansion. Consequently, the actual influx of public assistance recipients into the labor force occurred during a time of unprecedented growth.

During 1996-2000, an average of 3.3 million new jobs were created annually (see appendix A). Entry-level jobs grew an annual average 3.5 percent, while jobs in other occupational groups grew by 0.6 percent. By our estimate, close to 3 million of the new jobs generated by the economy were entry-level jobs, and fully half of those were low-skill jobs requiring only short-term on-the-job training. Therefore, entry-level jobs generated 90 percent of the new jobs in the economy, a favorable situation for both public

Table 7—Household results from moving welfare recipients into a distribution of jobs, Scenario 1b

Household scenario	Consumer units ¹	Change in:					
		Food stamp benefits	Other government transfers	Income tax	Labor supply	Labor income	Net income ²
	<i>Thousands</i>	<i>-----\$ billion-----</i>			<i>Millions</i>	<i>-----\$ billion-----</i>	
Total households	108,828	-6.9	-13.5	-8.2	2,400	24.0	128.4
By income group:							
Low-income	23,321	-6.9	-13.5	-.1	2,400	21.8	1.7
Welfare, no work	3,840	-6.9	-13.5	0	2,400	23.0	2.6
Welfare, with work	3,518	0	0	0	0	-.3	-.2
Nonwelfare, working and not working	15,963	0	0	-.1	0	-.9	-.7
Mid-income	58,090	0	0	-5.9	0	1.0	13.1
High-income	27,418	0	0	-2.3	0	1.3	113.5
By family type:							
Single-parent	10,633	-4.6	-9.9	-.5	1,491	13.9	2.6
Low-income	5,454	-4.6	-9.9	0	1,491	14.2	-.3
Welfare, no work	1,494	-4.6	-9.9	0	1,491	14.6	.1
Welfare, with work	1,844	0	0	0	0	-.2	-.1
Nonwelfare, working and not working	2,116	0	0	0	0	-.2	-.2
Mid-income	2,552	0	0	-.1	0	-.1	0
High-income	2,628	0	0	-.4	0	-.2	2.9
Other family types	98,195	-2.3	-3.6	-7.7	909	10.1	125.8
Low-income	17,867	-2.3	-3.6	-.1	909	7.6	2.0
Welfare, no work	2,346	-2.3	-3.6	0	909	8.4	2.6
Welfare, with work	1,675	0	0	0	0	-.2	-.1
Nonwelfare, working and not working	13,847	0	0	0	0	-.7	-.4
Mid-income	55,538	0	0	-5.8	0	1.1	13.1
High-income	24,790	0	0	-1.9	0	1.5	110.7

¹The number of consumer units are base values and do not change in the scenario.

²Net income is household income net of personal income taxes, where household income is earnings, capital income, and transfers.

Source: ERS simulation analysis.

assistance recipients who were working and those who were not working but who were looking for jobs.

We perform two additional scenarios to provide insight into the impact of the welfare-to-work policy of public assistance on the labor market in the late 1990s. Scenario 1c has the actual high-growth macroeconomic conditions of 1996-2000 (see table 1). Labor supply increased by 13.2 million, which includes 2.4 million public assistance recipients moving into the labor force into a mix of occupations, as in scenario 1b. For comparison, scenario 1d has the macroeconomic conditions of 1996-2000 but without the recipients moving into jobs; instead, they continue to participate in public assistance. Whereas, in 1b, we isolate the policy change from the macroeconomic changes, in 1d, we isolate the macroeconomic changes from the policy change. The labor market results for these two scenarios are in table 5.

In scenario 1b, we saw that the influx of public assistance recipients into the labor force depressed wages in the entry-level occupations, which is what we would expect in theory, as the influx is an increase in the labor supply of entry-level workers. The influx of entry-level workers also generates a modest increase in GDP as a result of the larger labor force (fig. 1i). However, scenario 1c incorporates the high GDP growth of the late 1990s, which results in a large increase in labor demand. The result is an increase in jobs and an 8-percent increase in wages for entry-level workers (fig. 1j).

For comparison, we looked at the macroeconomic conditions of 1996-2000, without the influx of public assistance recipients. In this scenario, wages increase for entry level workers by 10.3 percent, a greater increase than in scenario 1c. The influx of recipients into the labor force depresses wages, but not such that wages actually decline. Instead, the influx depresses wage **growth** over 1996-2000 by 2.3 percentage points. Although wages increase, the increase would have been greater without the influx of recipients. Consequently, the movement of public assistance recipients into the workforce between 1996 and 2000 did indeed negatively affect the entry-level labor market, although the prosperity of the late 1990s buoyed wages such that the negative impact on wages was not obvious.

Looking at the wages of high-skill occupations, we see that their wages grow 17.4 percent in scenario 1c but only 15.1 percent in scenario 1d. High-skill workers are better off **with** the influx of public assistance recipients into the labor force because, first, high-skill workers become relatively scarce once the recipients join the labor force and, second, greater economic growth comes with a larger labor force. Indeed, we estimate that real GDP growth would have been 1 percentage point lower over 1996-2000 **without** the movement of recipients into the labor force (not reported in tables).

Scenarios 2a and 2b

The alternate assumption of 50 percent of those leaving the AFDC-TANF program becoming employed, resulting in 2 million new workers, is used in scenarios 2a and 2b, although results are not presented here. (Results are available upon request from the authors.) We found that the influx of 2 million new workers, 16 percent fewer than in the previous scenarios, resulted in a wage impact 16 percent smaller in scenario 2a than in scenario 1a.

With all new employment in the short-term OJT occupation, the labor supply for this low-skill occupation rises by 4 percent and wages fall by 6.1 percent compared with 7.2 percent in scenario 1a. The wages for other occupations rise by 1.3 percent to 3.4 percent. Real net income falls by \$1.3 billion for the low-income households who leave public assistance and take jobs, compared with \$1.7 billion for scenario 1a. Real net income for the other low-income households drops by \$1.6 billion, as earnings are lower due to the fall in low-skill wages. The results are similar but more moderate than those in scenario 1a. We conclude that the qualitative results are the same with either the 70-percent or 50-percent assumption—wages for all low-skill workers decline, and those households who leave public assistance to work lose real net income with the lower earnings and loss of transfers.

In scenario 2b, 2 million new workers take jobs distributed over the occupations in which other low-income households work, resulting in wage impacts that are also about 16 percent less than in scenario 2a with the larger employment impact. Real net income for those moving from public assistance to work increases by \$2.2 billion, while it falls by \$0.8 billion for the other low-income households. Again, these results are similar to those in scenario 1b, so the 50-percent assumption does not change our findings.

Labor Supply Scenario Findings

We find that the influx of public assistance recipients affected the labor market between 1996 and 2000, following welfare reform. If we isolate the influx from the strong macroeconomic growth of 1996-2000, we find lower real wages for low-skill workers. Consequently, this policy change affected all low-skill workers, not just public assistance recipients who entered the labor force. This finding held up over various assumptions of the magnitude of the influx and of the skill levels of the individuals leaving public assistance to work.

Looking at the influx of public assistance recipients into the labor force during the strong economy and tight labor market of the late 1990s, we find reduced wage growth for low-skill workers. However, the larger labor force contributed to the strong economic growth, producing an additional 1 percentage point of real GDP growth over 1996-2000.

We get mixed results when we analyze whether the public assistance recipients who enter the labor force are better off working than receiving transfer payments. Depending on the wage impact, recipients were either worse off (scenarios 1a and 2a) or better off (1b and 2b). These findings show how the conditions of the labor markets can make all the difference in a low-skill individual's well-being. An influx of more or fewer workers into an occupational group can have an impact across a large number of households.

We use two different assumptions of the number of individuals leaving public assistance to work—2.4 million and 2.0 million—for sensitivity analysis. Some may find the 2.4 million assumption overly optimistic and at the high end of the range of likely possibilities. We find that using the more conservative assumption of 2.0 million as an alternative generated similar findings; so our qualitative conclusions are the same.

Recession Scenario

In analyzing the labor market impacts from the movement of public assistance recipients into jobs between 1996 and 2000, one important question is, what would have happened if there had been a recession? In a downturn, it would be more difficult for program participants to find jobs, and some individuals may lose their jobs and enroll in public assistance programs. To answer this question, we use scenario analysis with the CGE model to assess the impact of a recession on low-skill occupations relative to other occupations. In the model, the occupational mix is endogenous; that is, the occupational mix impact is determined by final demand. This feature of the model is necessary to determine if a recession disproportionately affects one or more occupational groups, and particularly, how the low-skill occupations are affected.

Each recession has its own personality in terms of duration, depth, and diffusion through the economy. In addition, crucial economic indicators, such as interest rates or exchange rates, may be different, reflecting the particular financial market conditions of each recession. We chose to use a stylized average of the seven recessions starting with the recession of 1957-58.¹⁷ The recession scenario is characterized by declining real GDP, job loss, and a drop in investment.

The recession that began in March 2001 was not included in the stylized average. Because the labor market lags the rest of the economy in a recovery, the employment impacts of the recession linger for some time, making it premature to include the 2001 recession in our analysis. Looking over March 2001 to March 2002, 1.7 million jobs, or 1.26 percent, were lost, the same job loss in the average recession. Other indicators, however, show a milder recession than average, with positive but slight GDP growth.

To incorporate the macroeconomic assumptions into the CGE model, investment growth is made exogenous, and the change in real GDP, employment, exports, and imports are targeted, using capital stocks and the exchange rate as controls for targeting. Real wages are fixed, allowing the labor market effects of the recession to occur through employment loss by occupation. Our focus here is the impact across occupational groups to analyze the effects on low-skill jobs. Once an estimate of the impact of a recession on the unemployment rate is made, we use past trends for the relationship between changes to the FSP caseload and unemployment rate to estimate the impact of a recession on the FSP caseload.

Hanson and Gundersen (2002) have summarized the findings from a number of econometric studies that have estimated the relationship between the FSP caseload and unemployment rate, after controlling for a number of other factors, such as policy changes.¹⁸ Research results suggest that the current period (1-year) effect of a 1-percentage-point change in the unemployment rate is about 700,000 more food stamp recipients and about 1.3 million more recipients in the longer run. A common assumption among the reviewed studies is that the relationship between the unemployment rate and FSP caseloads is symmetrical over the business cycle. However, there are two asymmetries, one with the unemployment rate over the business cycle and the other with the relationship of caseload change to unemployment during the growth phase of the business cycle, which differs from the relationship

¹⁷Many business cycle economists use a post-World War II average cycle as a comparison when analyzing a specific cycle or recession. They also exclude the two postwar recessions, 1948-49 and 1953-54, when calculating an average cycle, as there was much structural change in the economy between 1945-56 (Perry and Schultze, 1993).

¹⁸For TANF, estimates for the change in caseload range from 4 to 6 percent in the short run for a 1-percentage-point change in the unemployment rate and 6 to 9 percent in the long run (Blank, 2001).

during a recession. The unemployment rate rises faster during a recession than it falls during a recovery and growth phase (Zarnowitz, 1992, p. 256-9). In contrast, the change in FSP caseload relative to a change in the unemployment rate tends to fall at a greater pace during an economic recovery than it rises during a recession, an issue in need of further investigation.

In the average recession scenario (scenario 3), 1.7 million workers, about 1.3 percent, lose their jobs (table 8). For the occupational groups, the job loss is not evenly distributed. The largest job loss is in the low-skill, short-term OJT occupation (493,000), which accounts for 30 percent of the total job loss. This percentage is less than the occupation's share of initial employment, which is 38 percent of total employment. So, although this loss is disproportionately less than what some other occupations face, it is the largest in magnitude. The three on-the-job-training occupations that make up the entry-level jobs together account for almost 70 percent of the total job loss, which is disproportionately more than their initial share of employment (63.4 percent). As entry-level jobs are likely opportunities for participants in public assistance programs, an average recession seems to have a disproportionate impact on the types of jobs held by potential program participants.

The types of households affected by the job losses are primarily (89 percent) mid- and high-income households, which is proportionate to the initial distribution of jobs among households (table 9). Though two-thirds of the

Table 8—Aggregate labor market results from average recession and trend growth scenarios

Occupational group	Average recession, Scenario 3, change in:		Trend growth, Scenario 4, change in:	
	Labor supply	Wage	Labor supply	Wage
	<i>Thousands</i>	<i>Percent</i>	<i>Thousands</i>	<i>Percent</i>
Total labor	-1,667.8	-1.27	2,870.4	2.18
By occupational group:				
1 Professional degree	-16.2	-.94	53.9	3.12
2 Doctoral degree	.3	-.10	4.2	1.29
3 Master's degree	-2.1	-.24	10.7	1.20
4 Work experience plus bachelor's degree	-102.9	-1.10	206.8	2.21
5 Bachelor's degree	-149.9	-1.05	281.2	1.96
6 Associate's degree	-39.9	-1.00	136.0	3.40
7 Postsecondary vocational training	-98.0	-1.17	208.8	2.50
8 Work experience in a related occupation	-124.4	-1.22	206.4	2.02
9 Long-term OJT training	-332.0	-2.28	245.5	1.68
10 Moderate-term OJT training	-309.7	-1.78	433.2	2.49
11 Short-term OJT training	-493.1	-.98	1,083.7	2.16
By aggregate occupational groups:				
High-skill (1-3)	-18.0	-.6	69.0	2.30
Mid-skill (4-8)	-515.0	-1.1	1,039.0	2.20
Low-skill or entry level (9-11)	-1,135.0	-1.4	1,762.0	2.10

Source: ERS simulation analysis.

job losses are in entry-level occupations, only 13 percent of the job losses are from low-income households (186,000) because a large number of entry-level jobs are held by members of mid- and high-income households. Furthermore, there is the question of who, among those employed household members, loses his or her job and who retains his or her job during a recession. The low-income household members who have moved most recently from public assistance programs into jobs may be more likely to lose their jobs because they would have less seniority and work experience than other employees. Consequently, this analysis may overstate the impact for mid- and high-income households and understate for low-income households. However, we still conclude that the qualitative findings of this scenario are a large loss of low-skill jobs and loss of earnings across income levels.

From the approximately 200,000 jobs lost by low-income households, the FSP would gain an estimated 500,000 participants, assuming an average of 2.5 people per household and that FSP participation by all low-income people losing a job. Given that the unemployment rate increases by 1.4 percentage points in the recession scenario, the FSP caseload increases by about 350,000 people per percentage-point change in the unemployment rate. This number is smaller than even the static econometric estimates, which range between 700,000 to 1 million per percentage-point change in the unemployment rate (Hanson and Gundersen, 2002).

So far, our analysis of the impact of a recession on FSP caseload has not taken into account the fact that some mid-income households could have their incomes fall below the program eligibility levels if members lose their

Table 9—Household results, average recession scenario, Scenario 3

Household scenario	Consumer units ¹	Change in:					
		Food stamp benefits	Other government transfers	Income tax	Labor supply	Labor income	Net income
	<i>Thousands</i>	<i>-----\$ billion-----</i>			<i>Thousands</i>	<i>-----\$ billion-----</i>	
Total households	108,828	0	0	3.8	-1,667.8	-85.1	-51.9
By income group:							
Low-income	23,321	0	0	0	-186.1	-2.1	-3.4
Welfare, no work	3,840	0	0	0	0	0	-.4
Welfare, with work	3,518	0	0	0	-46.2	-.5	-1.0
Other	15,963	0	0	0	-140.0	-1.6	-2.0
Mid-income	58,090	0	0	-1.6	-660.2	-34.7	-34.1
High-income	27,418	0	0	5.4	-821.5	-48.3	-14.4
By family type:							
Single-parent	10,633	0	0	0	-111.4	-4.4	-4.1
Low-income	5,454	0	0	0	-40.1	-.6	-1.1
Mid-income	2,552	0	0	0	-20.6	-1.1	-1.1
High-income	2,628	0	0	0	-50.7	-2.7	-1.9
Other family types	98,195	0	0	3.8	-1,556.4	-80.7	-47.8
Low-income	17,867	0	0	0	-146.0	-1.5	-2.3
Mid-income	55,538	0	0	-1.6	-639.6	-33.6	-33.0
High-income	24,790	0	0	5.4	-770.8	-45.6	-12.5

¹The number of consumer units by household type are base values and do not change in the scenario. Source: ERS simulation analysis.

jobs. We have looked only at the impact on households that were already low-income at the start of the recession scenario. With the income level defining the low-income households at 130 percent of the poverty line, households in the mid-income group could move into poverty if members lose their jobs and enter the FSP. We estimate that, historically, anywhere from 812,000 to 3.894 million people, or an average of 2.5 million, fall into poverty per percentage-point increase in the unemployment rate.¹⁹ Only 25 percent of mid-income people moving into poverty would have to enroll in the FSP to bring the increase in FSP caseload up to 1 million per percentage-point change in the unemployment rate.

Growth Scenario

A growth scenario is a useful indicator of how the entry-level labor market will fare after the recent recession. The high rates of growth in the late 1990s cannot be expected to continue, and so trend values are reasonable assumptions. For the growth scenario, we use macroeconomic assumptions that are average annual values over 1957-2000—the trend rates for this period. The trend rates for GDP growth, fixed investment, capital stocks, and job growth are lower than those of 1996-2000. As with the recession scenario, the occupational mix is endogenous and so is determined by final demand.

Under trend growth, scenario 4, employment increases by 2.87 million jobs per year (table 8). The entry-level occupations are a relatively large share of the new jobs, 1.76 million, of which most (1.084 million) are the low-skill, short-term OJT jobs. As expected, households with working members are better off.

Growth is good for the economy, and spurs the movement of public assistance recipients into the workforce. The question here is whether or not a disproportionate impact may occur for low-skill and other entry-level jobs. We find that the benefits of trend growth are fairly proportional across the occupational groups, both in terms of job growth and wage increases. The result is that the low-skill, short-term OJT occupations have a proportional benefit from growth. This translates into the creation of a large number of jobs, which is useful for moving public assistance recipients into the workforce.

Although trend growth provides insight into the current expansion, it cannot be used as a forecast. Just as each recession has its own personality, so does each expansion. Furthermore, our scenario assumes uniform productivity growth over all industries, and if productivity growth were to vary among industries, the impacts would differ in both employment and wage effects.

Summary of Scenario Results

Our scenario analysis produces two main findings that answer our two research questions. First, in investigating the labor market impact of the influx of public assistance recipients into the workforce since welfare reform, we found that the influx of recipients into the labor market did, indeed, affect wages. In our scenario focusing on the policy change impact and controlling for macroeconomic conditions, this wage impact was in the form of an actual reduction in real wages. When we added in the high-growth macroeconomic conditions of 1996-2000, the wage impact appeared

¹⁹Rates of increase in poverty per increase in the unemployment rate have been found in other studies, ranging from 1.6 million to 3.2 million (Blank and Blinder, 1986; Tobin, 1994; Haveman and Schwabish, 2000; LeBlanc, 2001).

as reduced wage growth. So, wages grew, but not as much as they would have had not the 2.4 million welfare recipients entered the labor force. At the same time, this increase in the labor force produced an increase in GDP, which benefited the overall economy.

Our second finding addresses the question of how changes in macroeconomic conditions affect public assistance programs. We find that economic growth benefits the labor market proportionately across all occupations. A recession, however, can have differential impacts. In our average recession scenario, we find that entry-level jobs took a disproportionate hit in terms of job loss. Thus, welfare reform in a recession faces multiple hurdles—low-income, low-skill workers lose their jobs and public assistance recipients looking for jobs will find few job vacancies.

Conclusions

We set out in this research to address the following questions:

- (1) How did the influx of public assistance recipients into the labor force affect the labor market between 1996 and 2000, following welfare reform?
- (2) How do alternative macroeconomic conditions affect the ability of labor markets to absorb the new workers and consequently affect the effectiveness of public assistance programs?
- (3) Were public assistance recipients who moved into the workforce better off by attaining higher incomes than when they received public assistance?

In order to address these questions, we use a computable general equilibrium (CGE) model to analyze the impact of welfare reform and macroeconomic conditions on the labor market. We focus on low-skill jobs and workers by including a richness of labor market detail in the CGE model. The strength of this research and the contribution that it makes lies in the labor market detail in the CGE model that allows for the analysis of low-skill jobs and workers. In addition, we develop the household component of the model so that we can also see the relative impact on low-income households who receive public assistance compared with other households.

We find that the influx of public assistance recipients into the labor force since welfare reform (PRWORA) does indeed put wage pressure on low-skill occupations. In isolating the policy change—that is, looking at the impact of welfare reform isolated from macroeconomic changes—we measure this pressure as a decreased real wage. We estimate that approximately 2.4 million Food Stamp Program and Temporary Assistance for Needy Families participants moved into the labor force between 1996 and 2000, which accounts for about 18 percent of the labor force growth during this time period. If all this labor supply increase were in low-skill, short-term on-the-job-training (OJT) jobs, wages would be depressed by as much as 7.2 percent. If we assume that the jobs taken by the new workers ranged over all the occupations that already employed low-income households take, real wages would still decline, although only by 2.3 percent. This wage decline would affect all low-skill workers, not just those public assistance recipients who enter the labor force.

Looking at the impact of moving public assistance recipients into the workforce during the strong macroeconomic growth of 1996-2000, we find that the influx of workers puts wage pressure on the low-skill labor market, resulting in reduced wage growth. This reduction in wage growth is 2.5 percentage points for low-skill workers, such that wage growth is 4.4 percent versus 6.9 percent without the influx. However, we also find that the larger labor force contributes to the strong economic growth, accounting for 1 percentage point of real GDP growth over 1996-2000.

The impact of the influx of these workers is substantial enough that reducing the 2.4 million estimate of public assistance recipients entering the labor force to a more conservative estimate of 2.0 million does not qualitatively change the results.

Assuming that the welfare-to-work individuals take full-time, low-skill jobs, we find that real net income falls for these households, as their earned income does not compensate for the loss of benefit payments. In addition, other low-income households that are using public assistance but have household members who are in the workforce, or households that are not using public assistance, also lose earnings due to the decrease in real wages caused by the influx of low-skill workers. However, assuming that recipients enter the labor force with the same distribution of skills that other low-income households have and consequently take jobs in a broader range of skills, we find that low-income households that moved from public assistance to the workforce are better off in terms of real net income—their earnings are greater than their benefit payments.

In the recession scenario, the greatest job loss, both in percentage terms and in absolute numbers, is in the low-skill occupational groups, suggesting that the 2001 recession may strain the welfare-to-work feature of welfare reform if the labor market continues to be soft. The research shows that economic growth is not just good for the economy overall, but good for low-skill and other entry-level jobs. The particularly strong growth of 1996-2000 created a huge number of low-skill jobs and provided tremendous support for welfare reform. We would not expect such strong growth in the near future; however, the more modest trend growth still provides solid job growth for low-skill jobs.

These findings provide insight into the low-skill labor market and the labor market impact of moving public assistance recipients into the workforce. The finding that an influx of low-skill workers into the labor market results in a decline in real wage growth is an unintended consequence of the welfare-to-work emphasis of the current system for public assistance to low-income households. The finding that the negative labor market impact is smaller when welfare-to-work individuals enter the labor force with a broad range of skill levels suggests that education and training programs are useful, not only for public assistance recipients themselves but for other low-wage workers because real wage levels will not be depressed as much with the entry of the recipients into the labor force. The finding that the increase in labor supply from the movement of public assistance recipients into the workforce can contribute to economic growth indicates that the overall economy benefits. Finally, the finding that a recession results in the loss of a large number of low-skill jobs indicates that work requirements may need to be eased during downturns.

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Appendix A: Program Caseload and Labor Market Change, 1996-2000

Between 1996 and 2000, the combination of economic growth and welfare reform brought significant changes in program participation and employment of individuals from low-income households. We describe the change in program caseload for both the Food Stamp Program (FSP) and Temporary Assistance for Needy Families (TANF), estimate the impact of these changes on labor supply for 1996 through 2000, and put the estimated labor supply impact from the caseload change into context of employment growth during the period. The purpose of this analysis is to calculate a labor supply impact from the change in FSP and TANF caseload for the simulation analysis below.

Food Stamp Program Caseload Change and Labor Supply Impact

From 1996 to September 2000, monthly average persons participating in the FSP fell by 34 percent, while the household caseload fell by 30.5 percent (appendix table 1). Half of the 8.8 million net outflow of persons were children

Appendix table 1—Food Stamp Program data for households and participants, 1996-2000

Households/participants	1996		2000		Change, 1996-2000		Composition of change, 1996-2000
	Thousands	Percent	Thousands	Percent	Thousands	Percent	Percent
All households	10,552		7,335		-3,217	-30.5	
With earnings	2,379	22.5	1,993	27.2	-386	-16.2	12.0
With AFDC/TANF	3,866	36.6	1,891	25.8	-1,975	-51.1	61.4
With children	6,280	59.5	3,955	53.9	-2,325	-37.0	72.3
With disabled or elderly	3,567	33.8	3,301	45.0	-266	-7.5	8.3
Without children, elderly, or disabled	1,567	14.9	837	11.4	-730	-46.6	22.7
With elderly	1,710	16.2	1,542	21.0	-168	-9.8	5.2
With SSI	2,538	24.1	2,324	31.7	-214	-8.4	6.7
With noncitizen	1,108	10.5	469	6.4	-639	-57.6	19.8
All participants	25,926		17,091		-8,835	-34.1	
Children	13,214	51.0	8,765	51.3	-4,449	-33.7	50.4
Elderly	1,895	7.3	1,702	10.0	-193	-10.2	2.2
Nonelderly adults	10,783	41.6	6,623	38.8	-4,160	-38.6	47.1
Employment status, nonelderly adult:	10,783		6,623		-4,160	-38.6	47.1
Employed	2,188	20.3	1,801	27.2	-387	-17.7	9.3
Full-time	1,326	12.3	893	13.5	-433	-32.7	10.4
Part-time	527	4.9	729	11.0	202	38.3	-4.9
Other	335	3.1	179	2.7	-156	-46.6	3.8
Unemployed	1,034	9.6	463	7.0	-571	-55.2	13.7
Not-in-labor-force, nilf	7,320	67.9	4,031	60.9	-3,289	-44.9	79.1
Unknown	241	2.2	328	5.0	87	36.1	-2.1
Exempt from work, nonelderly adults nilf:	4,706	64.3	3,486	86.5	-1,220	-25.9	37.1
Disabled	2,186	29.9	2,110	52.3	-76	-3.5	2.3
Caretaker, ill or child	2,269	31.0	1,278	31.7	-991	-43.7	30.1
Student	251	3.4	98	2.4	-153	-61.0	4.7

Source: U.S. Department of Agriculture, Food and Nutrition Service, *Characteristics of Food Stamp Households: Fiscal Years 1996 and 2000*.

(4.4 million), 2 percent were elderly persons aged 65 and over (0.2 million), and 47 percent were nonelderly adults (4.2 million).²⁰ It is among the net outflow of nonelderly adults that the labor supply may increase. About 3.9 million of the FSP leavers from 1996 through 2000 were unemployed or not in the labor force while participating in the FSP, and hence are potential new workers.

Not all FSP leavers take a job, so we adjust the 3.9 million potential new workers for an employment rate. A study in Illinois finds that 50 percent of all food stamp leavers reported employment or earnings increases as their main reason for leaving the FSP, and that 61 percent of family leavers report an employment or earnings increase (Rangarajan et al., 2001). Using these figures, we adjust the number of potential new workers from the net outflow of FSP recipients for the percent of those who take a job when they leave the program. This results in 2.3 million new workers from the reduction in FSP caseload from 1996 through 2000.²¹ On an annual average basis, this amounts to 575,000 per year.

TANF Caseload Change and Labor Supply Impact

The number of adults in TANF fell by 2.365 million from the end of 1996 to the end of 2000 (appendix table 2). Adjusting for the number of participating adults who leave the program that already have a job and for the adults who leave the program but do not take a job, we estimate 1.50 million new workers from end-1996 to end-2000, or 375,000 a year over 4 years. For this estimate, we assume that 70 percent of leavers take a job, 11 percent of leavers were already working while participating in the program, and an additional 100,000 started working while participating in the program. The 70 percent of leavers taking a job is a high-end estimate from a survey of TANF leavers studies by Brauner and Loprest (1999) (see box). Brauner and Loprest estimated a range of 50 percent to 70 percent of leavers take a job. If we assume that only 50 percent of leavers take a job, then the increase in new workers would be 250,000 a year. An estimate of 50 percent to 70 percent of leavers taking a job approximates the complex dynamic movements into and out of welfare programs and into and out of employment.

²⁰The data are from USDA-FNS website (4-27-01): www.fns.usda.gov/pd/fssummar.htm, and publications on *Characteristics of Food Stamp Households for 1996 and 2000* (USDA-FNS, 1998 and 2001). The disabled are a negligible share of leavers.

²¹The calculation is: 2.3 million = (61 percent of 72.3 percent of 3.900 million) + (50 percent of 27.7 percent of 3.900 million), given that 72.3 percent of the net outflow of households are families with children and the remainder are adults without children.

Appendix table 2—TANF caseload data, 1996-2000

Participants	1996		1998		September	Change,	Composition
	Thousands	Percent	Thousands	Percent	2000	1996-2000	of change, 1996-2000
Families	4,552		3,179		2,187	-2,365	-52.0
Recipients	12,644		8,770		5,760	-6,884	-54.4
Children	8,671	68.6	6,330	72.2	4,099	-4,572	-52.7
Adults	3,973	31.4	2,440	27.8	1,662	-2,311	-58.2
Adults:							
Employed	448	11.3	556	22.8			
Full-time work	203	5.1					
Part-time work	246	6.2					
Unemployed	436	11.0	1,098	45.0			

Source: U.S. Department of Health and Human Services, Administration for Children and Families.

TANF Leavers' Employment Rate

The assumption that 70 percent of welfare leavers take a job is optimistic. However, several studies have found that welfare leavers take jobs at the rate of 60 percent to 75 percent. The main source of information on the employment of those leaving TANF and the FSP are a series of leaver studies. In a review of TANF leaver studies, Brauner and Loprest (1999) qualify their findings by pointing out that the employment rate among leavers depends on how employment is measured. Estimates depend on whether all leavers are counted or just those who remained off welfare (continuous leavers), and whether the survey question is for a point in time, or whether they worked at any time during a given period (durational estimates). They find that the majority of the point-in-time employment rates are between 65 percent and 75 percent. The employment rate for continuous leavers is at the upper end of the estimates, while it is at the lower end of the range for all leavers. The majority of the durational estimates of employment rate are around 82 percent to 88 percent, with one low estimate at 68 percent.

Other reports summarize the TANF leaver studies. Haskins, Sawhill, and Weaver (2001) report that they find about 60 percent of mothers are employed at the time of the interview and about 75 percent have been employed at some time since leaving welfare. The U.S. General Accounting Office (1999) reports that the employment rate ranges from 61 percent to 71 percent for all recipients including those who return to welfare, when measuring employment at the time of the survey. The employment rate ranged from 63 percent to 87 percent, when employment is measured as occurring at any time since leaving welfare. A U.S. Department of Health and Human Services (2001) study summarizing the leavers studies states that slightly over half of all leavers work in any given post-exit quarter, while 70 percent of leavers worked in at least one quarter.

Using data from the National Survey of America's Families for 1997, Loprest (1999) finds that 69 percent reported leaving welfare because of increased earnings. Sixty one percent of leavers were working at the time of the survey. On average they received wages equal to those earned by other low-income mothers. More than two-thirds of the employed former recipients work a full-time schedule (35 hours per week or more). The annualized median monthly earnings of former recipients are roughly equal to the 1997 poverty level for a family of three. To the extent that the former recipients do not work full-time full-year, earnings will fall short of the poverty level of family income and other sources of income will be important. In a follow up study, Loprest (2000) reports that the employment rate for single parent leavers is 71 percent for those leaving between 1997 and 1999, compared to 65.6 percent for those leaving between 1995 and 1997.

Looking at food stamp recipients, a study in Illinois found that 50 percent of all food stamp leavers reported employment or earnings increases as their main reason for leaving the FSP, and that 61 percent of family leavers report an employment or earnings increase (Rangarajan, et al., 2001).

Combined Labor Supply Impact from FSP and TANF Caseload Change

In designing a simulation experiment with an increase in labor supply from the net outflow of both TANF and FSP recipients, it is necessary to adjust the number of potential new workers from one program or the other to avoid double counting. About 60 percent of the 2.3 million potential new workers leaving the FSP from 1996 to 2000 are also leavers from TANF (appendix table 1). We make the adjustment by subtracting 60 percent of the new workers leaving the FSP. The result is 2.4 million new workers as a net outflow from the FSP and TANF during 1996 through 2000, an annual average of 600,000 per year. Consequently, we assume 2.4 million new workers in the simulation analysis.

Labor Market Changes and Their Relation to Program Caseload Change

From 1996-2000, total employment grew from 132 million to 145 million workers. Average annual employment growth between 1996 and 2000 was 2 million, 3 million, or 3.3 million per year depending on the employment measure used. The 2-million figure is from household survey data, the 3-million figure is from establishment survey data, and the 3.3-million figure is from the employment projections data which synthesize household and establishment data into a comprehensive labor market employment value.²² The movement of 600,000 recipients per year from TANF and FSP into jobs accounts for 18.2 percent of the larger employment growth figure, from 1996 through 2000.

²²For household and establishment employment see Employment and Earnings (U.S. Department of Labor, Bureau of Labor Statistics, 2001). For employment projections, see Hecker (2001).