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Taxes, Transfers, and Women's Labor Supply in the United States[⊗]

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Abstract:

The U.S. tax and transfer system generates revenue and provides safety net programs that move millions out of poverty. Since women are more likely to live in poverty, they are more likely to qualify for means-tested transfers. The structure of taxation in the U.S. often penalizes secondary earners, who are usually women. These programs alter work incentives and consequently may affect labor supply decisions. In this chapter, we examine the empirical evidence on the effects of taxes and transfers on the labor supply of women in the U.S. We show that much has changed since 1990, with the biggest shift being a change from cash transfers via welfare to refundable tax credits to workers. Overall, the evidence we review shows women have higher labor force participation and are less responsive to changes in after-tax wages than they were before 1990, but the labor supply effects vary substantially by program considered.

Keywords: taxes; transfer programs; women's labor supply; Earned Income Tax Credit; Temporary Assistance for Needy Families; Medicaid

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Introduction

Governments design tax and transfer systems in order to fund public expenditures and to reallocate resources within the economy. The transfers made are non-trivial. For example, on the eve of the Great Recession in 2007, the United States transferred over half a trillion dollars in federal means-tested cash and in-kind benefits to families (Ben-Shalom, Moffitt, and Scholz, 2012). Substantially larger sums were transferred as part of the stimulus package in the following years. These safety net programs move millions out of poverty and have been shown to have additional positive effects on short- and long-run outcomes, including improvements in infant, child, and adult health, reductions in mortality and food insecurity, and alleviation of stress in the household.¹ These benefits come at a cost, however, since taxes and transfers also alter work incentives and consequently may affect labor supply decisions.

In this chapter, we examine the empirical evidence on the effects of taxes and transfers on the labor supply of women in the United States. Our focus is on women for several reasons. First, the transfer programs we analyze affect a larger proportion of women since women are more likely to live in poverty and are therefore more likely to be eligible for means-tested programs. Additionally, women are more likely to live in families with children, which often triggers either eligibility for transfers or larger transfers. Second, in the U.S., taxes are levied on the family unit and not at the individual level, which, in turn, influences women's labor supply choices, since they are still more likely than men to be the second earner in the household. Finally, women's labor supply has traditionally been more responsive to taxes and transfers than that of men, leading Claudia Goldin to argue that women "gave birth" to the modern study of labor supply (2006).

In what follows, we first provide an overview of the labor supply decision, as well as background on how taxes, transfer programs, and women's labor supply have changed over time. We examine features of the U.S. tax code that may differentially influence women's labor supply. We then discuss several of the largest (historically) means-tested federal transfer programs: Aid to Families with Dependent Children (AFDC, now Temporary Assistance for Needy Families (TANF)), the Earned Income Tax Credit (EITC), Food Stamps (now the Supplemental Nutrition Assistance Program (SNAP)), Medicaid, and Supplemental Security Income (SSI).² For each section, we describe the main program features, and review evidence on the effects of these programs on women's labor supply. We focus on the period since 1990 due to dramatic changes in the nature of public transfers in the U.S. since that time, but we discuss several studies that examine the introduction of the respective programs. Although the circumstances women face have changed since these programs were introduced, these studies often offer the cleanest empirical identification of the program's influence on women's labor supply.

Background

In a static labor-leisure choice model, represented in Figure 1, whether an individual decides to work (the extensive margin) and whether an individual already working decides to change the number of hours worked (the intensive margin) depends on the individual's preferences over leisure and

¹ See Ben-Shalom, Moffitt and Scholz (2012) for a discussion of poverty rates, and the volumes edited by Moffitt (2016) for effects of these programs on other outcomes.

² We do not discuss job training programs or subsidized housing in this chapter, but refer interested readers to recent reviews of the literature by Collinson, Ellen, and Ludwig (2016) for low-income housing, and Barnow and Smith (2016) for employment and job training programs.

consumption goods, the opportunity cost of time spent in leisure (the wage rate, w), and the availability of unearned income or in-kind benefits (G). In this model individuals have a fixed endowment of time (hours) and allocate it towards labor and leisure according to their preferences. Although non-labor time is referred to as leisure, it includes unpaid home production, which is more common for women than for men. Each hour spent in labor yields earned income of w . Earned or unearned income can be used to purchase consumption goods, at a price of \$1 per unit. Consumption in dollars (Income) is graphed on the vertical axis, and time in leisure is graphed on the horizontal axis; time in labor is simply the time endowment minus the hours allocated towards leisure. Changes in unearned income or the wage rate lead to changes in the budget constraint.

In Figure 1, Panel A, a woman with no unearned income faces budget line BL_1 . Receiving unearned income G causes a parallel shift of the budget constraint to BL_2 as illustrated in Panel A. The pure income effect associated with this change increases the amount of leisure chosen, assuming that leisure is a normal good, which we do throughout this discussion. Mechanically, when leisure increases, the optimal amount of labor decreases. One type of individual (solid indifference curves) chooses to decrease hours worked on the intensive margin, going from point A on the lower indifference curve to point B on the higher indifference curve to maximize utility. A second type of individual (dashed indifference curves) has stronger preferences for leisure and/or home production and chooses to decrease hours worked to zero, going from point C to point D to maximize utility, where the corner solution represented by point D results in no time spent in paid work (extensive margin change).

Alternatively, a wage increase pivots the budget constraint upward, as illustrated in Figure 1, Panel B. Before the wage increase, a woman with no unearned income faces budget line BL_3 and chooses point X. After the wage increase, bundle Z on BL_4 is chosen. This wage increase causes two effects. First, the slope of the budget constraint has changed to reflect a higher opportunity cost of leisure. The substitution effect leads the woman to consume less leisure (move from point X to point Y), and therefore to work more. However, the wage increase also provides more income for a given amount of time working. This income effect will lead her to consume more leisure and to work less (the move from point Y to point Z). Consequently, for the individual shown in Panel B, the income and substitution effects offset each other. The opposite is true for a wage decrease – the substitution effect would cause the woman to consume more leisure and work less, while the income effect would cause her to consume less leisure and to work more. In general, the combined effect of a wage change on leisure choice is ambiguous in direction, and depends on the relative magnitudes of the income and substitution effects.

The structure of the income tax code and the public transfer programs we discuss alter unearned income and/or the relative price of leisure, and sometimes create kinks or discontinuities in the budget constraint. Researchers often exploit changes in the income tax code and changes in the structure of public transfer programs to identify effects of these changes on labor supply.

Changes in Program Recipients and Expenditures over Time

As we highlight in our discussion below, major expansions in the Earned Income Tax Credit, followed by passage of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), which “ended welfare as we know it” meant that the 1990s saw a huge shift in how income support in the United States is provided – away from direct cash transfers to non-workers and towards in-kind transfers and refundable tax credits for workers.

To demonstrate the shift over the period considered, Figure 2 plots the evolution of the percent of the U.S. population receiving transfers by program since 1980.³ Two important takeaways emerge from this figure. First, Medicaid and Food Stamp/SNAP programs serve the broadest segment of the population. Over this time period, Medicaid recipients grew steadily, while Food Stamp/SNAP enrollment exhibits a countercyclical pattern – rising during economic downturns, especially after the Great Recession. Second, beginning in the mid-1990s there is a dramatic shift in the relative importance of AFDC/TANF and the EITC. By 2007, the EITC is the third largest program in terms of recipients. Strikingly, today AFDC/TANF serves fewer people per capita than SSI, which is categorically restricted to individuals with disabilities. Expenditure data echoes the recipient trends. In 1990, except for Medicaid, AFDC was the largest means-tested public transfer program in terms of dollars of spending. By 2012, TANF expenditure was lower than for Medicaid, the EITC, SSI, and SNAP.⁴ In 2012, for every dollar spent on TANF cash benefits, over seven were spent on the EITC (Bitler, Hoynes, and Kuka, 2017).

Women’s Labor Supply Since 1980

Figure 3 provides an overview of women’s labor supply in the United States from 1980 to present. Panel A illustrates trends in labor force participation rates for women by the age of their oldest child, and shows that those with the youngest children have the lowest labor force participation rates. For all groups, labor force participation rates increased steadily through 2000, and have since fluctuated around their 2000 levels. Panel B graphs participation by education since 1995 and, while the trends are fairly flat, they reveal that women without high school degrees have participation rates less than half those for women with college degrees. Panel C illustrates how unemployment rates vary over time by a woman’s marital status and is indicative of much larger business cycle swings for unmarried women, and therefore much larger potential income volatility. Finally, Panel D examines single women separately and shows that through the mid-1990s, employment rates were less than 50 percent for single women with two or more children but that since that time, their employment rates have become much closer to single women with one or no children. In the discussion that follows, we discuss the extent to which these patterns can be explained by recent changes to tax and transfer programs that have altered labor supply incentives.

Taxes and Women’s Labor Supply

The U.S. system of joint taxation means that taxes are levied on family income, not individual income. If women are second earners under a progressive tax structure, the after-tax wage used to make labor supply decisions is lower. In addition, all of their earnings are taxed, unlike the first earner for whom a portion of earnings are untaxed due to deductions and exemptions. This issue is more pronounced by positive assortative mating (Frankel, 2014). The reduction in the after-tax wage is equivalent to a change in the slope of the budget line in Figure 1, Panel B. When the tax system results in a lower after-tax wage, an individual would decrease the amount of labor supplied due to the substitution effect, but increase it due to the income effect of this tax-induced wage change. Finally, without adjustments for marital status, joint taxation with a progressive scheme can lead to a marriage penalty (subsidy) where a couple pays higher (lower) tax for the same earnings when married than when single.

³ We thank Robert Moffitt for generously sharing raw data and data sources, which we used to update the recipient counts to the most recent years available.

⁴ While SSI serves a relatively small share of the population, average benefits are relatively high, leading to higher percentage expenditure.

Labor supply elasticities (for both participation and hours worked) reflect the responsiveness of individuals to changes in wages, and are determined by the magnitudes of both income and substitution effects. For men, labor force participation has been historically high with little variation, and estimates for men's labor supply elasticities have been quite small. Women, however, are more likely to make changes on the participation (extensive) margin, because they have traditionally been less connected to the labor force, and because as secondary earners they have faced higher marginal tax rates and hence greater work disincentives. As a result, estimated labor supply elasticities for women are typically larger than for men (Blau and Kahn, 2007; Keane, 2011; and McClelland and Mok, 2012). Even so, there is variation across women in terms of labor supply elasticities; the labor supply of single women without children is less responsive than that of mothers, and low income single mothers eligible for the EITC appear to be more responsive than higher income married mothers. More recently, as they have become more connected to the labor force over time, women's labor supply elasticities have become more similar to those of men. Additionally, over many decades, the top marginal tax rates have fallen, reducing the work disincentives created by a progressive tax system.

The majority of the recent empirical evidence on the effect of the U.S. tax system on the labor supply of women comes from changes in the EITC, which we discuss later in the chapter. Changes to the U.S. tax code other than the EITC tend to affect high-income married women. Below, we describe research on the estimated effects of changes to the tax system on women's labor supply.

Prior to 1948, the U.S. taxed income at the individual level regardless of marital status. LaLumia (2008) studies how the change in definition of tax unit affected labor supply decisions of highly-educated married women. Prior to the change, married couples in community property states had always been taxed on half the couple's earnings, so after the change individuals in these states did not experience a change in marginal tax rate. She employs a difference-in-differences strategy where women in community property states are the control group and finds that the employment rate of women in the treated states decreased by 2 percentage points. These findings are echoed in Guner, Kaygusuz and Ventura (2012), who use structural estimation to predict what would happen if the U.S. were to revert to single-unit taxation. Their simulations suggest that this would increase labor supply and that all the change would be due to married women's labor supply response.

More recently, revisions to the tax code in the Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA01) and the Jobs and Growth Tax Relief and Reconciliation Act of 2003 (JGTRRA03) reduced the marriage penalty. Eissa (2009) demonstrates how these changes altered the marginal and average tax rates individuals faced, and then uses the 2000 Current Population Survey (CPS) to simulate what average and marginal taxes would have been under 2004 tax statutes. Although the evidence provided is not causal, she predicts that high earners and secondary earners experienced the greatest reduction in marginal tax rates as a result of EGTRRA01 and JGTRRA03, and that the labor supply response of married women was much larger than the overall response. In analysis of the same changes to the tax code, Singleton (2011) provides plausibly causal estimates by defining treatment and control groups using a sharp change in the marginal tax rate for earners with \$65,000 to \$75,000 of adjusted gross income, and compares their earnings responses. He also uses the CPS data but is able to link it to the IRS's Detailed Earnings Record data. His estimates decompose couples' joint earnings responses into the parts due to husbands and to wives. He finds that the response is driven entirely by changes in husbands' earnings. One reason that these two studies draw different conclusions is that Eissa predicts effects across the distribution of tax brackets while Singleton's results rely primarily on one part of the

distribution. Given that high earners and secondary earners may respond differently, more work on understanding the labor supply response to these tax changes is warranted.

In addition to changes in marginal tax rates, a variety of tax credits affect labor supply. Tax credits reduce tax liability (and some, like the EITC, are refundable), which would help to offset the work disincentives inherent in the tax system. The EITC and the Child Tax Credit (CTC) have become increasingly important over time. While we discuss the EITC later in this chapter, the labor supply effects of child-related tax credits are less studied. Wingender and Lalumia (2017) compare women giving birth in December to those giving birth in January and show that the added income due to the child-related tax credits that the December mothers receive relative to the January mothers leads to reductions in their labor supply. Related, Averett, Peters, and Waldman (1997) study the (nonrefundable) Child Care Tax Credit (CCTC), which reduces the tax burden of families with dependent care expenses. They incorporate the CCTC into a structural model of labor supply, and find by increasing the effective wage for working mothers, tax credits for child care can significantly increase women's labor supply.

Taken together, the empirical evidence suggests that the U.S. tax system affects labor supply choices, especially for women.

Transfers and Women's Labor Supply

A number of different programs in the United States help low-income families. These programs affect labor supply incentives in different ways. In this section, we discuss some of the largest means-tested transfer programs, their work incentives, and the empirical evidence on their effects.

AFDC and TANF

The Aid to Dependent Children (ADC) program was created as part of the Social Security Act of 1935 to provide means-tested cash assistance to children of single parents – typically, widows.⁵ In the 1960s, the program expanded to include the adult caregiver and was renamed Aid to Families with Dependent Children (AFDC). Under AFDC, families with income below a certain level were entitled to AFDC benefits. States were allowed to set maximum benefit levels, and there was a large degree of variation across states. Federal rules in the 1980s and 1990s required that AFDC benefits be reduced dollar-for-dollar with earnings after a minimal tax-free “disregard” (Ziliak, 2016), effectively reducing the after-tax wage rate to zero and creating large disincentives for work.

Figure 4 shows how the AFDC program with a maximum benefit level of G and a 100% marginal implicit tax rate (the benefit reduction rate (BRR)) affects the budget constraint. Individuals earning less than G in the absence of AFDC (for example, at point A) will almost certainly move to point B, while individuals earning substantially more than G (for example, at point C), will be unaffected by the benefit.⁶ Not surprisingly, evidence from this time period that exploited cross-sectional variation across states in maximum AFDC benefits suggests that AFDC did reduce labor supply by approximately 10-50% (Moffitt

⁵ For recent reviews of the literature on AFDC/TANF, see Blank (2009) and Ziliak (2016).

⁶ The presence of earned income disregards in eligibility calculations complicates the simple budget constraint presented in Figure 5. See Matsudaira and Blank (2014) for a detailed discussion. Ziliak (2007) shows that the effective AFDC BRRs (after accounting for these disregards and other state-level differences) were in the range of 40-50%.

1992).⁷ However, evidence from this same period suggests that single mothers were quite unresponsive to changes in the BRR.

AFDC work disincentives, along with concerns about family structure, largely motivated policy efforts to reform the U.S. welfare system beginning in the late 1980s and early 1990s. The 1988 Family Support Act, for example, required states to implement work-related activity programs, and to require that a certain percentage of recipients participate. Additionally, a growing number of states requested waivers to the federal AFDC rules so they could change elements of their welfare programs. These waivers included features such as financial incentives for work, work requirements, family caps (restrictions on benefits for families that had additional children while on the welfare rolls), time limits, and sanctions for noncompliance with program rules. The push for reform culminated in the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA). PRWORA replaced AFDC with the TANF program, eliminating the legal entitlement to benefits associated with AFDC.

PRWORA included a number of components that had been part of the welfare waivers, including work requirements, sanctions, and time limits. It required that by 2002, half of the caseload must be participating in 30 weekly hours of work-related activity. Recipients who do not comply with work and other requirements can be sanctioned from the welfare rolls. PRWORA also instituted a lifetime limit of five years of federal benefits. In addition, states were given a great deal of flexibility to customize features of their state TANF programs. As a result, substantial variation emerged in program features that were once constant across states.⁸ Subsequent research relied on this cross-state variation to identify policy effects, including those for labor supply.

There is a sizeable literature examining the effects of welfare reform on employment. Much of this research consists of reduced form difference-in-differences analysis that exploits variation across states and over time in the presence of state welfare waivers that preceded TANF during the early 1990s. As described by Schoeni and Blank (2000), this approach requires a “parallel trends” assumption – essentially, that outcomes in the states with and without waivers would have evolved in a similar fashion if it were not for the passage of the waivers. This assumption is problematic for simple comparisons, since economic conditions were worsening in most waiver states over this time. More sophisticated analyses that control for the evolution of economic conditions are more convincing.

Another approach is to use a triple differences framework, using educational attainment as a third source of variation, since welfare reform should primarily have affected the labor supply of less-educated women. This research provides strong and consistent evidence that the presence of any of the waivers described above significantly increased labor supply of less-educated women – with effects on the extensive margin of employment (Schoeni and Blank, 2000) and the intensive margin of hours worked, weeks worked, and total earnings (Moffitt, 1999 and Schoeni and Blank, 2000).

Estimating the effects of TANF *per se* (relative to AFDC) on labor supply is more difficult, since TANF was enacted at the federal level. Schoeni and Blank (2000) exploit variation across states in the specific month of TANF implementation, and use a similar triple-differences approach to compare the effects of

⁷ This type of cross-sectional analysis is problematic if state-level differences in maximum benefits are correlated with unobservable characteristics that may also affect labor supply.

⁸ PRWORA also led to an expansion in child care funding. As noted by Ziliak (2016), in 2012, 12% of TANF dollars went directly to child care (with an additional 4% going to the Child Care Development Fund). See Kimmel and Connelly (this volume) for a detailed discussion of childcare issues.

TANF on employment for less-educated women relative to those with higher levels of educational attainment. While they find large negative effects of TANF on welfare participation, they find no significant effects of TANF on any employment-related activities.

Other work looks at specific welfare policies, either under welfare waivers, or TANF, or both. Grogger (2003) separates out time limits from other welfare reform, and interacts these policies with the age of the youngest child, since policies should have a larger effect on families with more years of potential eligibility. Both time limits and other welfare reforms significantly increase employment rates, with the effects largest for families with the youngest children. Kaushal and Kaestner (2001) also find significant effects of time limits on the labor supply of unmarried women. Looney (2005) finds that higher BRRs and lower cash benefits increase employment, and exemptions from work requirements reduce it. Fang and Keane (2004) find positive effects of both work requirements and time limits on employment. Matsudaira and Blank (2014) examine state differences in earnings disregards after welfare reform, but find no significant effects on women's labor supply.

Another set of papers estimates structural models that jointly incorporate the welfare participation and labor supply decisions of forward-looking individuals (Swann, 2005; Keane and Wolpin, 2010; Chan, 2013). These models can then be used to predict the effects of "welfare reform"-type counterfactual scenarios. All three papers examine time limits and work requirements and find that both increase employment. Keane and Wolpin also simulate the complete elimination of welfare benefits, which yields large predicted increases in employment.

The literature on the effects of AFDC/TANF on labor supply grew rapidly following the major reforms in the 1990s. However, as discussed by Ziliak (2016), the flow of research on TANF has slowed. This is likely due in part to dramatically-reduced caseloads and spending on TANF in recent years, but also due to the lack of additional variation to identify causal effects. As we discuss below, the weakening role played by TANF in the safety net has important implications for the relationship between the program and women's labor supply.

EITC

The Earned Income Tax Credit (EITC) is a refundable tax credit that provides income support for working, low-income families through the tax code.⁹ To be eligible for the EITC, an individual or couple must have positive earned income and adjusted income below certain income limits. The largest benefits are for those with qualifying children. Since 1993, however, small benefits have been available for childless adults. For tax year 2017, the maximum credits range from \$510 for childless adults to \$6,318 for families with three or more children, and families with adjusted gross income up to \$53,930 are eligible for benefits (IRS, 2017).

While the EITC was initially quite small in the years following its introduction in 1975, a series of expansions dramatically increased it in scale. The Tax Reform Act of 1986 expanded eligibility for the credit, raised it, and adjusted it for inflation. It was further expanded in 1990, which for the first time differentiated between families with only one child versus two or more children. The largest of these expansions came in the Omnibus Reconciliation Act of 1993. As part of President Clinton's efforts to "make work pay", the EITC was expanded enough that a family of four with a full-time minimum wage

⁹ For a recent survey of the literature on the EITC, see Nichols and Rothstein (2016).

earner would be raised above the federal poverty line. The most recent expansion of the EITC, part of President Obama's stimulus package in 2009, created a higher benefit for families with more than two children, and shifted the schedule for married couples. Figure 5 shows the EITC schedule for a family with three children in 1990, 1993, 1996, and 2009 all in constant 2014 dollars, and the dramatic increases in the tax credit for larger families. There have been no changes in the structure of benefits since 2009, so the EITC schedules for recent years are identical to those from 2009 after adjusting for inflation.

Families with no earned income are ineligible for the EITC. For earners, the benefit schedule consists of three ranges. In the phase-in range, the credit is increasing with earnings up to the maximum benefit. In the flat range, the EITC received remains constant. In the phase-out range, benefits are reduced for every dollar earned.¹⁰ The phase-in credit and phase-out reduction are equivalent to a wage subsidy and wage tax, respectively. Figure 6 illustrates the effect of the EITC on the budget constraint and possible optimal consumer choices under four segments of the constraint. Predicted effects of the EITC on labor supply are quite different for the extensive versus intensive margin and for each of the three EITC ranges. Since benefits are only received by workers, the EITC unambiguously encourages employment among non-workers (Panel A, move from J to K) through a substitution effect. Once workers receive benefits, a negative income effect discourages labor supply throughout the range of eligible incomes. But, in the phase-in range, the substitution effect (Panel B, move from L to M) counteracts, at least to some extent, the work disincentive of the income effect (Panel B, move from M to N). In the flat range, workers are only affected by the income effect (Panel C, move from O to P). In the phase-out range, the substitution effect (Panel D, move from Q to R) is reinforced by the income effect (Panel D, move from R to S), reducing hours worked. This pattern of predicted effects suggests that labor supply responses for single mothers, who are more likely to be the only earner in their household, might be quite different from the responses of married mothers, who are more likely to be secondary earners.

Much of the evidence on the effects of the EITC exploits variation in benefits generated by the large expansions of the credit in 1986, 1990, and 1993, although recent work by Bastian (2017) examines the introduction of the EITC in 1975. Bastian uses a difference-in-differences framework comparing mothers (who were newly eligible for EITC benefits) to women without children (who were ineligible). He pays careful attention to rule out other contemporaneous employment shocks in the 1970s, and finds that the EITC significantly increased the relative employment of mothers. Eissa and Liebman (1996) examine the 1986 expansion using a difference-in-differences approach, comparing less-educated single mothers to less-educated single women without children. Grogger (2003) limits his sample to families headed by women, and examines the effect of the maximum EITC credit by family size on employment for the years 1978-1999. Variation in this measure comes entirely from the EITC expansions over time and across families of different sizes. Meyer and Rosenbaum (2001) look at single women, and incorporate EITC variation through a variable that indicates the income taxes paid if the respondent works. This measure is negative for lower-income single mothers due to the refundable nature of the EITC. Results from all three approaches are quite consistent, suggesting large positive effects of the EITC on the extensive margin, but smaller, if any, effect on the intensive margin.

There is less evidence on labor supply effects for married mothers, but the research that exists, using both difference-in-differences approaches as well as more detailed measures of net-of-taxes wages, suggests that the EITC is responsible for small decreases in employment and hours of married mothers

¹⁰ Currently the phase-in rate is 45% for families with two or more children, and the phase-out rate is 21.06%.

(Eissa and Hoynes, 2004, 2006). These effects are largest for families in the phase-out range, where both the income and substitution effect cause reductions in labor supply.

Researchers have also looked at other dimensions of EITC effects. The increase in the labor force participation of single mothers in the 1990s was accompanied by much discussion of whether those women were entering “dead-end” jobs, or jobs with potential for greater earnings growth. Evidence from Dahl et al. (2009) uses a difference-in-differences approach comparing mothers with two or more children to mothers with only one child, and suggests that the 1993 EITC expansions were associated with higher earnings growth for mothers who were more affected by the EITC. In addition, it has long been noted that since EITC benefits are set at the federal level, they are not adjusted for regional differences in the cost of living. Fitzpatrick and Thompson (2010) also use a difference-in-differences approach to examine the 1993 expansion, comparing single mothers to single women without children. They find large effects on labor supply in metropolitan statistical areas (MSA) with the lowest costs of living, but no effects for MSAs with the highest costs of living.

As is illustrated in Figure 3, Panel D, the late 1990s saw a dramatic increase in the employment of single mothers. A number of the papers mentioned in this section and the section on AFDC/TANF attempt to decompose this growth into parts that can be attributed to welfare reform versus the EITC expansions versus the booming economy. Most of this literature finds that while the EITC had the largest effect, welfare reform (in particular, cuts in benefit levels, time limits, and work requirements) and economic conditions also played an important role (Meyer and Rosenbaum, 2001; Grogger, 2003; Fang and Keane, 2004; and Looney, 2005).

SNAP

The second largest means-tested federal program in terms of caseload per capita is the Supplemental Nutritional Assistance Program (SNAP), formerly the Food Stamp program.¹¹ SNAP is an entitlement program that provides an in-kind benefit that can only be used to purchase food. Eligibility is universal - individuals are not required to meet categorical rules related to family status or age as with many of the other programs discussed in this chapter. The structure of the program is set by the federal government, though states can alter some features (such as work requirements, timing of payments, and period of time before being reevaluated for benefits) through their administrative role (Currie, 2003; Hoynes and Schanzenbach, 2016). Benefits are based on the composition of the household with benefits growing non-linearly with increases in family size. For a family of three, the maximum monthly SNAP benefit in the continental US for 2016-2017 is \$511 (USDA, 2017), with higher benefits in Alaska and Hawaii.

Individuals qualify for SNAP if they fall below a gross income cut-off (130% of the poverty line) and a net income cut-off (100% of the poverty line). The BRR is 30%, so that SNAP benefits drop \$0.30 for each dollar earned above the maximum benefit income threshold, introducing clear work disincentives on both the intensive and extensive margins as illustrated in Figure 7. An individual may choose to drop out of the labor force (move from A to B) or reduce hours worked (move from C to D). The degree to which SNAP actually affects labor choices is, however, an empirical matter.

¹¹ See Currie (2003) and Hoynes & Schanzenbach (2016) for extensive reviews on the SNAP program, as well as other need-based federal nutritional assistance programs such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and the National School Breakfast and National School Lunch programs. We found no empirical literature on the labor supply effects of these other large nutritional assistance programs.

Establishing the labor supply effects empirically is made difficult by several factors, as outlined by Currie (2003) and Hoynes and Schanzenbach (2016, 2012). First, SNAP is a federal program, so cross-state variation in program eligibility cannot be used to identify effects. Second, there is little variation in the program over time, except for changes for some groups due to welfare reform, including limits for immigrants and able-bodied adults without dependents (ABAWD), as well as elimination of benefits for convicted drug felons (Hoynes and Schanzenbach, 2016). Finally, with the exception of the changes due to welfare reform, the program is universal, making it difficult to find reasonable comparison groups. Possibly due to these estimation difficulties, the literature on the causal effect of SNAP on labor supply is sparse.

When the Food Stamp program was introduced, funding constraints meant that it was rolled out gradually, with some counties receiving benefits much earlier than others. Hoynes and Schanzenbach (2012) use this initial county-level rollout for identification. Their treatment-on-the-treated estimates indicate substantial labor supply effects for households headed by single women: a drop of over 500 hours per year, and a 24 to 27 percentage point reduction in the employment rate. Very little research evidence exists for the period since welfare reform. East (2016) uses cuts for immigrant eligibility due to welfare reform and the subsequent re-expansion to immigrants to study the labor supply effects of SNAP for the immigrant population. Because states restored benefits at different times, East is able to use a difference-in-differences model to provide causal estimates of the labor supply effects of the re-expansion. She finds that single immigrant women are 6% less likely to work when receiving SNAP and married immigrant men reduce hours worked by 5%. Stacy, Scherpf, and Jo (2016) use variation resulting from welfare reform-induced work requirements for non-exempt individuals (typically able-bodied adults without dependents (ABAWDs)) and show that the affected groups appear to increase labor supply when eligibility is limited. Last, Cuffey, Mykerezi, and Beatty (2015) use variation in expansion of state work requirement waivers for ABAWDs as a result of the 2009 stimulus package to show waiver increases had little effect on ABAWDs' labor supply. The empirical evidence, while limited, suggests that the introduction of SNAP had large effects on the labor supply of single mothers, and that more recent changes aimed at subgroups had smaller, but non-trivial effects on labor supply.

Medicaid

Medicaid is an in-kind program that provides medical insurance to targeted populations, and is the largest federal means-tested program in terms of both caseloads and expenditures. Medicaid began in 1965 and is a joint state-federal program, with guidelines set at the federal level and implementation occurring at the state level. States are required to meet federal guidelines, but are free to be more generous with benefits. Originally Medicaid eligibility was narrowly linked to particular groups through other transfer programs, such as the elderly and individuals with disabilities (through receipt of SSI) and single-parent families (through receipt of TANF). As a result, Medicaid eligibility was affected by the income thresholds for these programs, and earning income above those thresholds led to disenrollment from both the cash transfer program and Medicaid. The potential loss in health insurance coverage increased the implicit marginal tax rates for individuals on these programs and created strong work disincentives. Due in part to concerns regarding these work disincentives, many changes have occurred to the Medicaid program since the mid-1980s, including the creation of pathways for poor children (and sometimes their parents) to Medicaid that were not conditional on receipt of other cash assistance. Buchmueller, Ham, and Shore-Sheppard (2016) provide a detailed overview of the Medicaid program.

Even after these work-incentive enhancing changes, Medicaid could still influence labor supply decisions directly through a number of mechanisms. The provision of health insurance shifts out the budget constraint, as illustrated in Figure 8. While receiving benefits, an additional hour of work still earns a wage of w , so there is a zero benefit reduction rate and therefore no substitution effect. However, the income effect could lead to an individual choosing fewer labor hours (moving from A to B or C to D). Furthermore, the loss of Medicaid creates a significant discontinuous notch in the budget constraint, where all benefits are taxed away. This would be expected to reduce labor supply and create bunching around that point (moving from A to B, for example).

Beyond these direct effects, labor force decisions may be affected by whether compensation includes employer-provided health insurance, and the individual's outside options if one leaves the job: transition to another job with health insurance; purchase private insurance; take up public insurance; or be uninsured. The choices available may influence an individual's labor force participation, hours of work supplied, or job mobility. "Job lock" occurs when an individual remains in a position where skill match is poor because the job provides health insurance. Related, if an individual remains employed anywhere in order to secure health insurance benefits, this is termed "employment lock". Alternatively, "job push" occurs when an individual leaves a job without insurance that is a good match for a job with insurance that is a worse skill match (Hamersma and Kim 2009). In sum, changes in Medicaid eligibility may lead to changes in labor supply on the extensive or intensive margin, as well as type of job chosen.

Work on the introduction of Medicaid by Strumpf (2011) and Decker and Selck (2012) finds no significant effect of Medicaid on the labor supply of households headed by single women. Much has changed since then and the majority of the evidence we discuss relies on changes since 1990 in Medicaid eligibility that occurred due to changes in the federal Medicaid rules or other state specific policy changes.

One set of changes expanded coverage of children. The Omnibus Budget Reconciliation Act of 1990 (OBRA 90) greatly expanded coverage for children ages 6 through 18 and, in 1997, the Balanced Budget Act created the State Children's Health Insurance Program (SCHIP, or CHIP). Subsequent legislation has reauthorized and modified this coverage. For individuals with children, the child expansions allowed for children to continue on (or enroll in) the Medicaid program even if the family did not qualify for AFDC. Yelowitz (1995) examines the child expansions that started in the 1980s through the early 1990s and shows that while ever-married women respond by increasing labor force participation, there is no evidence of this effect for never-married women. However, Ham and Shore-Sheppard (2005) use the same data source and policy variation and find no discernable labor supply effects. Their analysis suggests that Yelowitz's findings were due to two analysis choices. First, he constrained AFDC and Medicaid income limits to have effects that were equal in magnitude but opposite in sign – a restriction not predicted by theory and rejected by the data. Second, he used only the net income test and not the gross income test to determine welfare eligibility.

A second set of changes occurred as part of PRWORA in 1996, which severed the link between Medicaid and AFDC, and allowed some states to increase their income thresholds and to expand Medicaid eligibility to previously ineligible individuals. Hamersma and Kim (2009) examine the effect of increased eligibility on both job lock and job push using the state-level expansions in eligibility after PRWORA. They find that these expansions reduce job lock for unmarried women but not for men or married women, and they find small effects on job push for men. Hamersma and Unel (2017) provide further insight on these findings, by examining the time limits introduced by welfare reform. They show that

these time limits force individuals to make intertemporal choices and that this will in some cases lead to reductions in labor supply.

A third set of studies uses changes in state programs to examine the effects of Medicaid on labor supply. Baicker, Finkelstein, Song, and Taubman (2014) use variation generated by the Oregon Medicaid lottery, which randomly assigned Medicaid eligibility among a group of uninsured, poor adults. The authors find no evidence that Medicaid influences labor supply. However, Garthwaite, Gross, and Notowidigdo (2014) examine the sudden disenrollment of recipients after Tennessee abruptly halted the expansion of its Medicaid program and show that affected individuals, primarily adults who would not have been eligible prior to welfare reform, increased their labor supply, with effects most pronounced on the extensive margin. Focusing on a similar population, childless adults, Dague, DeLeire, and Leininger (2017) examine the labor supply effects of a sudden imposition of an enrollment cap for Wisconsin's Medicaid program. Using regression discontinuity and difference-in-differences methods, they show that individuals enrolled prior to the cap are less likely to be working. They examine these differences by sub-group and find that women have larger responses than men.

Last, and most recently, the Patient Protection and Affordable Care Act of 2010 had the goal of reducing the number of uninsured individuals, in part by expanding Medicaid in all states to all individuals under the age of 65 with income at or below 133% of the poverty line. In 2012, however, a Supreme Court decision made the Medicaid expansion optional to the states, and only 32 states chose to take up the Medicaid expansion. A number of papers have used this variation between expansion and non-expansion states to examine the employment effects of the Medicaid expansion. Gooptu et al. (2016) use a difference-in-differences approach and find no effect of the expansion on the likelihood of transitions from being employed to non-employed, from one job to another, or from full-time to part-time, even on subsamples that are more likely to be affected. Garrett and Kaestner (2015) and Leung and Mas (2016) also find no significant effects on labor market outcomes using a difference-in-differences framework. One concern with the difference-in-differences approach in this context is that the states that took up the expansion are quite different from those that did not, so the required assumption that the trends in the comparison group show what would have happened in the absence of the expansion may be unlikely to hold. Kaestner et al. (2015) supplement their difference-in-differences analysis with a synthetic cohort approach, noting that the parallel trends assumption may not hold for certain subgroups, and find limited if any evidence of employment effects. Perhaps because the overall effects are negligible, even when these studies stratify their samples by gender, no significant differences are found.

SSI

The Supplemental Security Income (SSI) Program provides means-tested income support to children with disabilities, working-age individuals with disabilities and to the elderly. The maximum federal monthly benefit for an individual was \$733 in 2016, and benefits are indexed for inflation. In addition to income and asset tests, individuals must go through a multi-step process to determine whether they have a qualifying disability.¹²

The means-tested nature of SSI mechanically creates potential work disincentives for both individuals with disabilities and their families. We do not focus on disabled individuals since SSI's categorical requirement of a work-limiting disability implies low labor force participation for recipients: recipients

¹² For a detailed overview of the SSI program, see Duggan, Kearney, and Rennane (2016).

must show that they are unable to work to be determined eligible for benefits. However, since income from other family members is generally “deemed” to the SSI recipient, and since disability payments alter household resource constraints, the labor supply of those non-disabled family members (parents of a child recipient or a spouse of a working-age recipient) could be affected. When deeming, the first \$20 of unearned income per month is disregarded, as is the first \$65 of earned income. After that, benefits are reduced at a rate of 50% with additional earnings. As such, the budget constraint of an individual whose child or spouse receives SSI can be represented as in Figure 9, which shows the budget constraint faced by individuals in programs with a gradual BRR, similar to the SNAP program, but where the benefit (G) is large relative to non-program earnings. We reviewed research on effects of the SSI program on women’s labor supply through two main channels: 1) the effects on mothers of children with disabilities;¹³ and 2) the effects on wives whose spouses are disabled.

Several researchers have examined the response of parental labor supply to child SSI participation. Kubik (1999) looks at the years immediately following *Sullivan v Zebley*, a 1990 Supreme Court decision that significantly expanded SSI eligibility for children, and estimates a regression in the spirit of difference-in-differences that finds that higher SSI benefits were associated with reductions in labor supply among less educated household heads in the years after 1990. Duggan and Kearney (2007) use the longitudinal nature of the Survey of Income and Program Participation (SIPP) to examine the effects of enrollment of a child onto SSI, and find no evidence of effects on parental labor supply. Neither study estimates labor supply effects separately by parent gender.

In two complementary papers, Deshpande examines the effects of the removal of a child SSI recipient from the rolls on parental labor supply. In (2016a), she examines a PRWORA requirement that child SSI recipients have their cases re-determined at age 18, and uses a regression discontinuity approach to show that removal of an 18 year old from the SSI program does not significantly affect parental earnings. However, Deshpande (2016b) uses variation generated by cuts in the SSA budget for continuing disability reviews, and finds that for younger children removed from the SSI rolls, parental earnings *completely* offsets the loss in SSI income. This effect is entirely at the intensive margin, and the earnings response for single mothers is the same as for the full sample.

Guldi et al. (2017) exploit SSI eligibility rules for low birth weight infants, and use a regression discontinuity approach to show that during the child’s first year, less-educated mothers of eligible babies experience a reduction in labor supply on the intensive margin of approximately 20 hours per week. Assuming that less-educated women earn the minimum wage, the loss in labor earnings is roughly equal to the average SSI benefit paid to a child recipient. Fathers experience a much smaller reduction in labor supply, which is consistent with their traditional role as primary earners. This paper also finds significant improvements in child motor skill development and in parenting behaviors, which could be due to the relaxed time constraint faced by mothers of these low birth weight infants.

Last, Bound et al. (2003) examine how SSI receipt affects family income and labor supply decisions of the non-disabled spouse. They link SIPP data to Social Security Administration administrative data to trace out income from different sources around the time of SSI applications and spousal labor supply decisions. They find that the increase in SSI income is for the most part offset by decreases in AFDC income and spousal earnings.

¹³ Any potential labor supply responses may be dampened since work by Bailey and Hemmeter (2014) shows that 22% of child SSI recipients have at least one adult SSI recipient in the house.

To summarize, the strongest causal evidence on labor supply effects of SSI appears in work decisions on the intensive margin for the parents of disabled children and the spouses of disabled individuals.

Discussion

The literature summarized above shows evidence of labor supply effects, often more pronounced for women, for some but not all of the programs we discussed. It also raises a number of interesting questions for further consideration.

The majority of this literature focuses on average program effects, but these average effects may miss an important part of the picture. Bitler, Gelbach, and Hoynes (2006) use an experimental evaluation of the Connecticut Jobs First program and estimate quantile treatment effects. They find that the program had different effects at different points in the earnings distribution, and that these effects were consistent with theoretical labor supply predictions. Their results also suggest that common approaches, such as stratifying analyses by observable characteristics, are insufficient to solve this problem. Their results suggest that, where possible, it could be important to look beyond mean impacts when studying public transfer programs.

Additionally, most of the empirical literature examines the labor supply effects of a given program in isolation. However, the safety net includes many complicated interactions, and many recipients qualify for (and receive benefits from) more than one program (Moffitt, 2015; Schmidt, Shore-Sheppard, and Watson, 2016). While a few papers have accounted for labor supply effects of multiple program participation (e.g. Keane and Moffitt, 1998), more work that takes into account these interactions is warranted.

In addition, very large differences exist in women's labor supply across localities. For example, Black et al. (2014) report Census data showing that among white married women with a high school degree, employment rates in 2000 were 79% in Minneapolis, but only 52% in New York City. This variation in women's labor supply and how taxes and transfers may influence or be affected by this dispersion is understudied. While welfare reform led to large changes at the national level, it also spawned a great deal of variation in program characteristics and rules across states. For example, Schott, Pavetti, and Floyd (2015) have documented that only 34% of TANF dollars at the national level was spent on cash assistance and work supports in 2015, and that this fraction of funds spent on "core activities" varies hugely across states. Spending on child care subsidies also varies a great deal by state. Work that documents and analyzes variation in program characteristics and how it might be related to geographical differences in women's employment would be valuable.

Finally, some components of the safety net play much less of a role than in previous years. Our own Figure 2 shows the decreasing importance of TANF relative to other safety net programs in recent years. Furthermore, TANF caseloads did not increase in response to the unemployment shock generated by the Great Recession, suggesting that the program's current role as a counter-cyclical stabilization policy is limited (Bitler and Hoynes, 2016). In 1996, on the heels of passage of PRWORA, for every 100 families in poverty 68 received TANF. By 2014, this number had shrunk to 23 (Floyd, Pavetti and Schott, 2015). Understanding how state decisions on program parameters and TANF spending relate to the diminished responsiveness of TANF to the business cycle documented by Bitler and Hoynes (2016) is important. More generally, as some aspects of the safety net are weakened, how should we think about the relationship between the safety net and women's labor supply?

Conclusion

The U.S. tax and transfer system alters women's budget constraints and influences their labor supply choices. The magnitude (and for some programs the direction) of those effects, however, is an empirical question. Women's labor force participation has increased since 1990 and women have, overall, become less responsive to changes in the after-tax wage since that time. Except for the EITC, however, evidence on effects of the U.S. tax code on women's labor supply is minimal. More research has been focused on the labor supply effects of transfer programs. The literature surveyed in this chapter shows that welfare reform appears to have increased the labor supply of single mothers, but today TANF serves far fewer individuals than it did historically, and it is unclear to what degree it continues to influence women's labor supply decisions. Conversely, the EITC has had increasing influence over women's labor supply decisions. The evidence we review shows that the EITC has significantly increased the labor supply of single mothers on the extensive margin, but has led to small decreases in the labor supply of married mothers. The most recent EITC expansions are set to expire in 2017, however, which could reverse some changes in labor supply for these groups. The introduction of the Food Stamp program had large negative effects on the labor supply of single mothers, but there is much less recent evidence on the effects of SNAP. Medicaid appears to have small, if any, effects on labor supply. For SSI, recent evidence suggests potentially large labor supply effects for the parents of child SSI recipients. Although single mothers are well-represented in the literature on AFDC and TANF caseloads, the empirical literature regarding their labor supply response to many of the programs we examined in this review is limited. Future work could improve our understanding for this particularly vulnerable group.

Finally, focusing only on labor supply effects ignores important short- and long-term benefits of these transfer programs on a wide variety of outcomes, as documented in Moffitt (2016). Cuts to the federal programs we discuss may marginally increase women's labor supply, but the cost of these cuts would be borne by those who experience the short- and long-term benefits of the programs.

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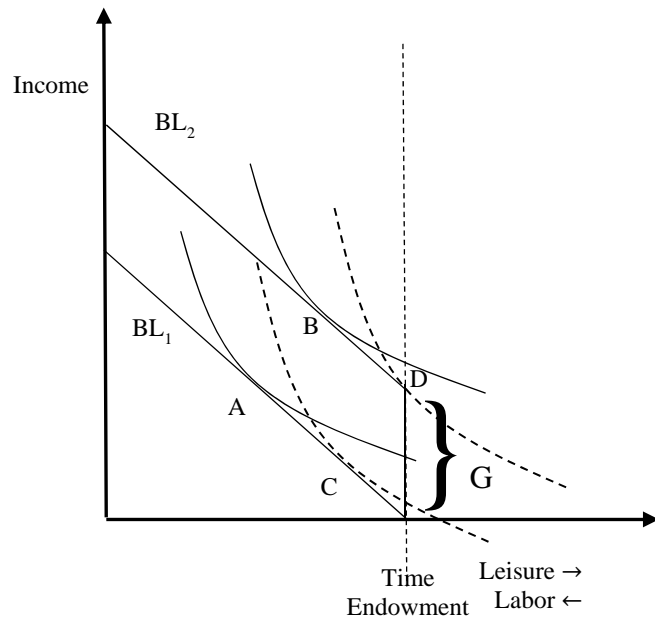
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Figure 1: Labor-Leisure Choice

Panel A: Unearned Income



Panel B: Wage Increase

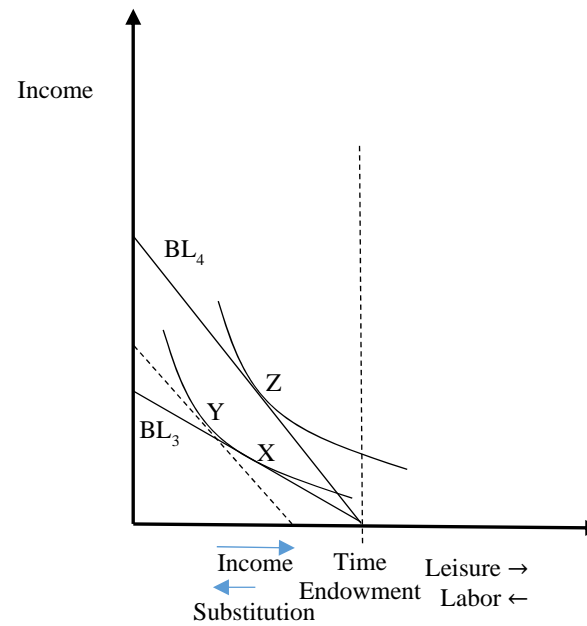
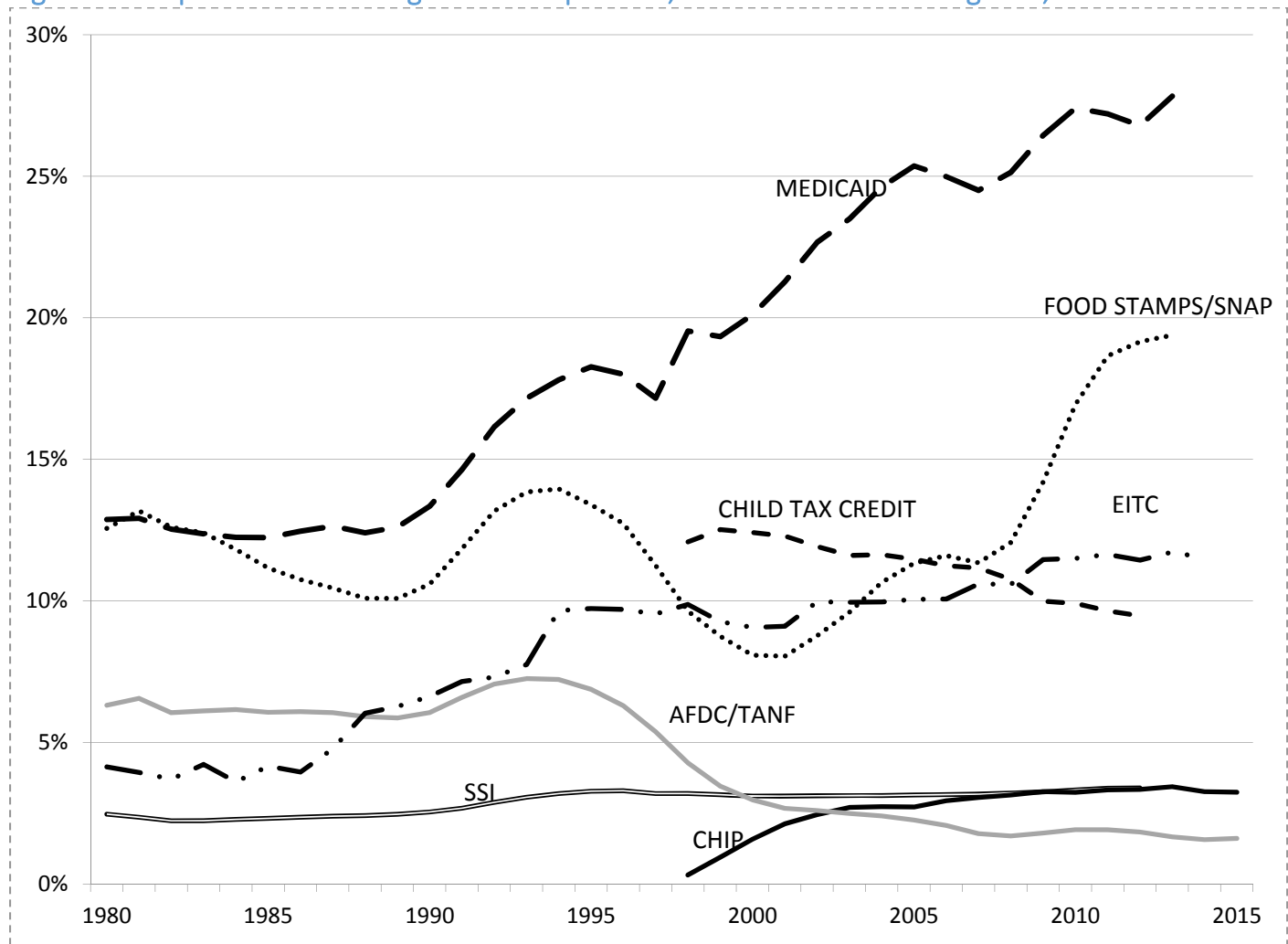


Figure 2: Recipients as Percentage of U.S. Population, U.S. Means-Tested Programs, 1980-2015



Source: Data plotted is annual number of recipients divided by U.S. population. Historical data provided by Robert Moffitt. The authors updated each series for the most recent years available. Detailed list of sources available upon request.

Figure 3: Labor Force Participation and Employment Status, U.S. Women, by Demographic Characteristics

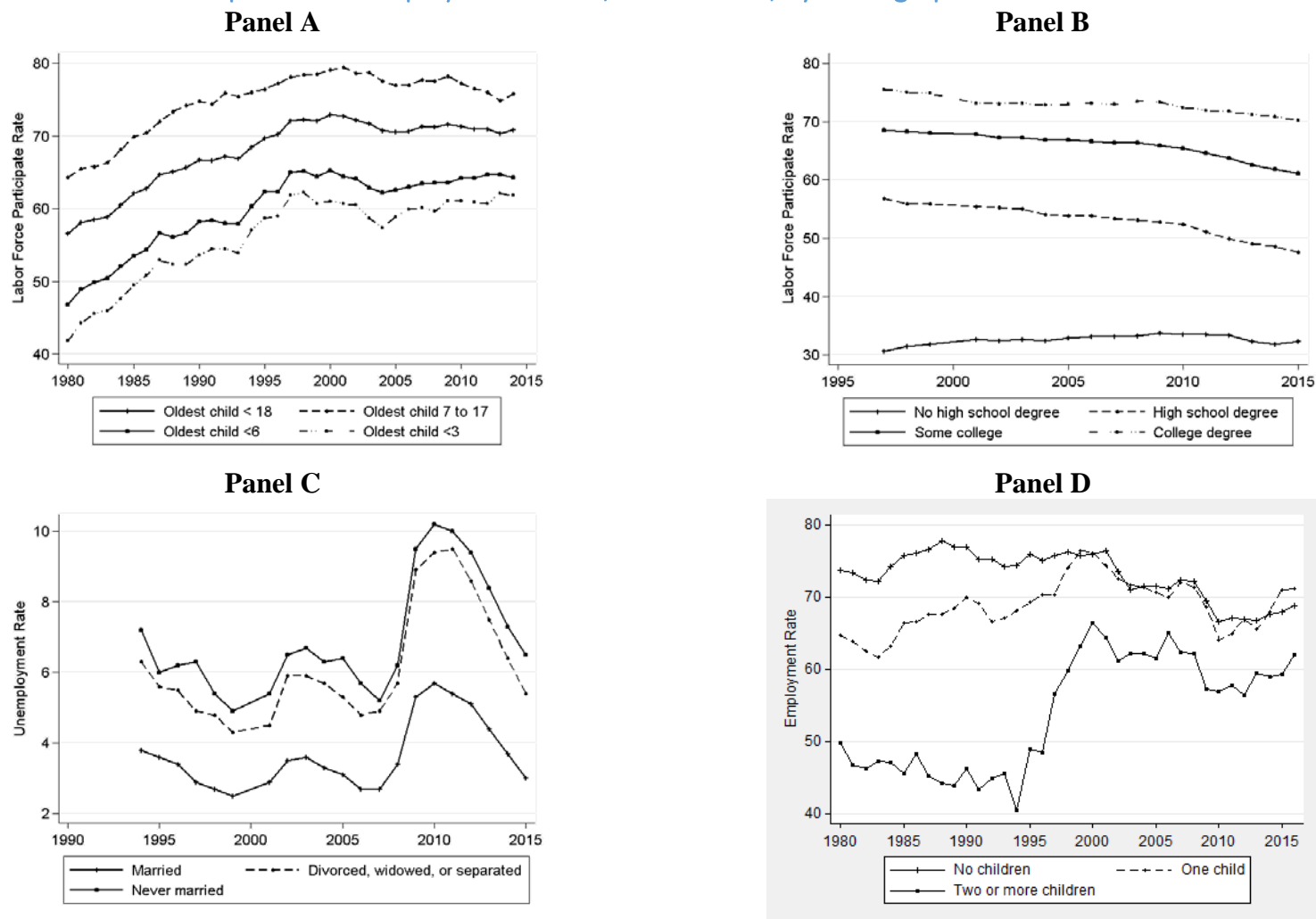


Table Notes:

All raw data in Panels A-C obtained from the Bureau of Labor Statistics. Labor Force Participation Rate and Employment to Population Ratio by age of children come from various years of the BLS publication “Women in the Labor Force: A Databook”; Labor Force Participation Rate by Education (Table 7) and Unemployment Rate by Marriage for women ages 25 and older (Table 24)

were obtained from <https://www.bls.gov/cps/tables.htm>. Data by education or marital status are only available since 1997 and 1994, respectively. Data in Panel D comes from authors' tabulations of Current Population Survey March Supplement data. Sample includes unmarried women ages 19-44.

Figure 4: Possible Optimal Labor-Leisure Choices, AFDC/TANF with 100% Benefit Reduction Rate

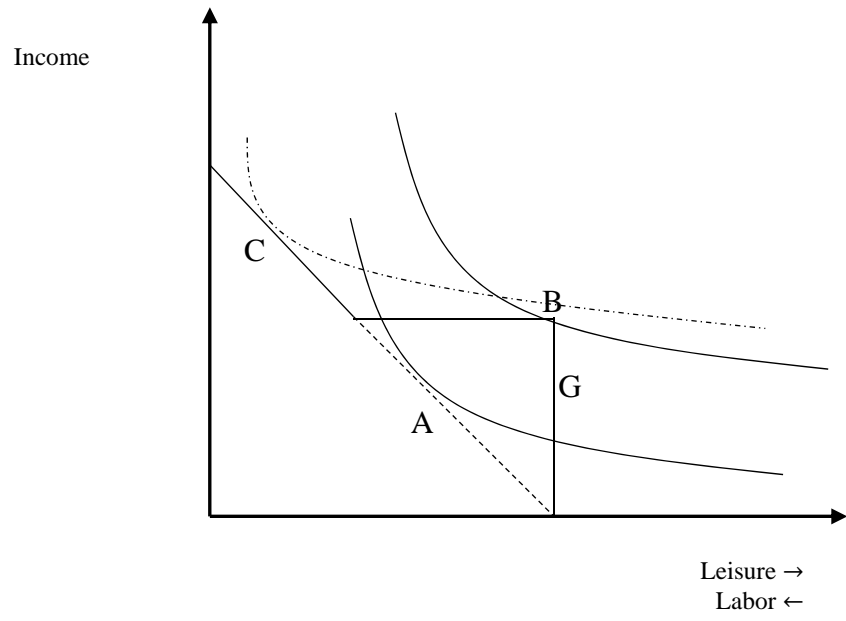
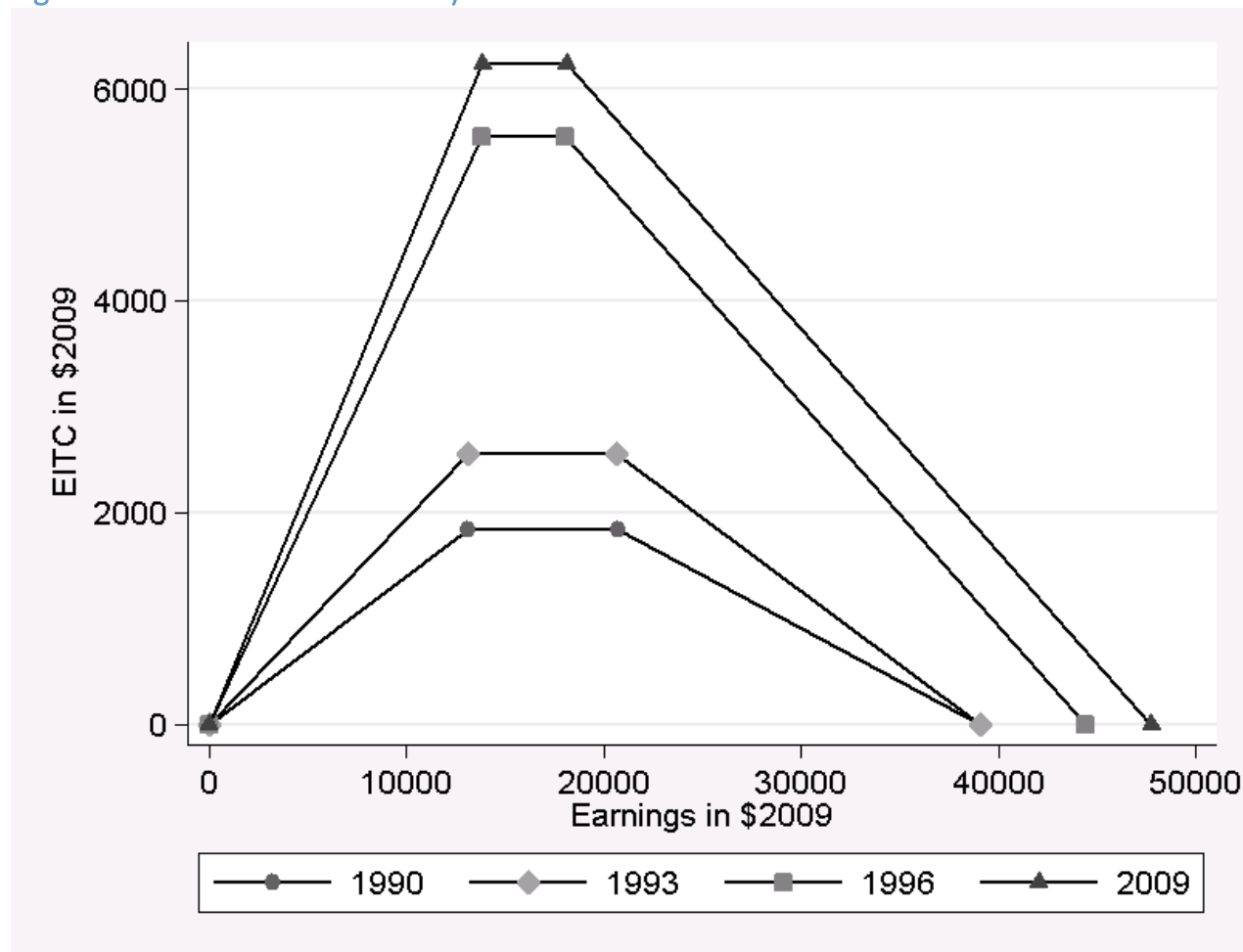


Figure 5: EITC Schedule for Family with Three Children in 2014 dollars



Source: Tax Policy Center. <http://www.taxpolicycenter.org/statistics/eitc-parameters>. Values plotted are for the highest credit based on number of children for each year: 1 child (1990), 2 or more children (1993-1996) or 3 or more children (2009). The EITC has not changed appreciably since 2009 after adjusting for inflation.

Figure 6: Possible Optimal Labor-Leisure Choices, EITC with phase-in and phase-out regions

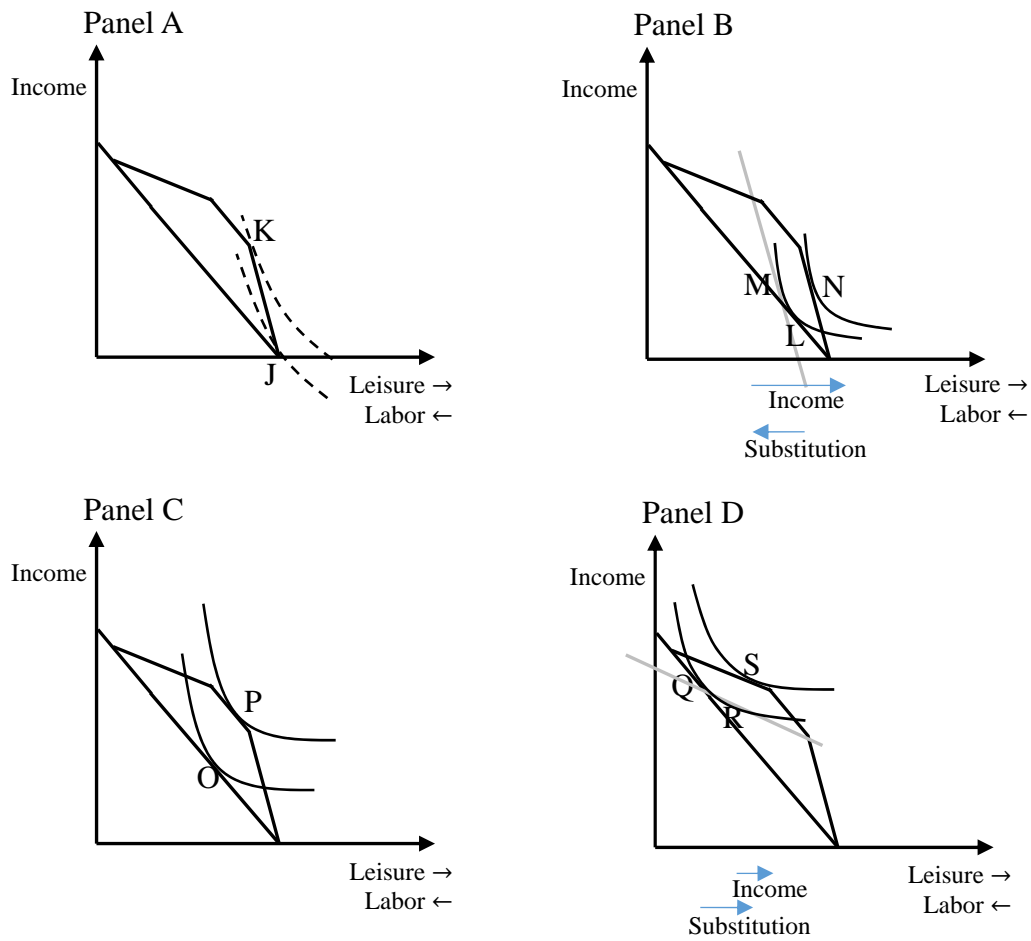


Figure 7: Possible Optimal Labor-Leisure Choices, SNAP with a less than 100% Benefit Reduction Rate

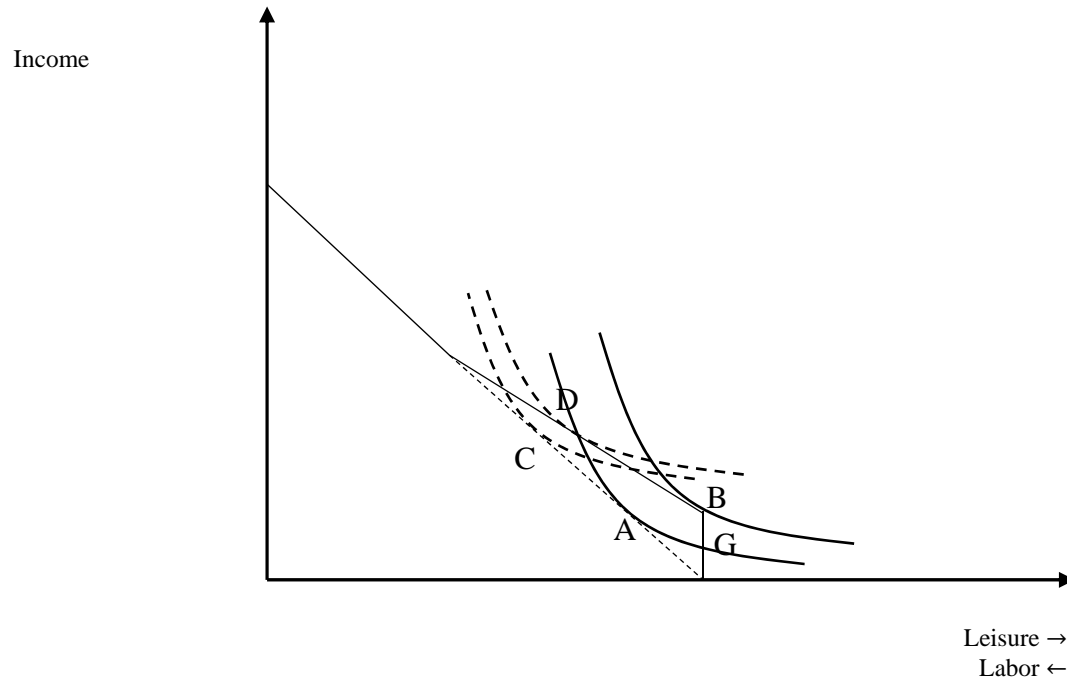


Figure 8: Possible Optimal Labor-Leisure Choices, Medicaid With a Notch

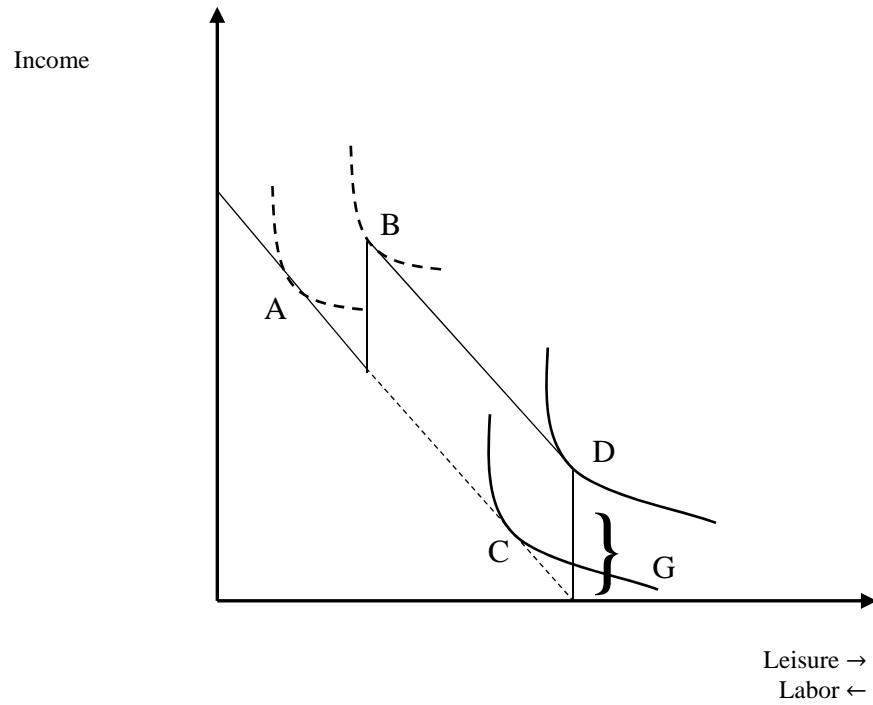


Figure 9: Possible Optimal Labor-Leisure Choices, SSI with a less than 100% Benefit Reduction Rate

