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Is the EITC as Good as an NIT? Conditional Cash Transfers and Tax Incidence†

By Jesse Rothstein*

The EITC is intended to encourage work. But EITC-induced increases in labor supply may drive wages down. I simulate the economic incidence of the EITC. In each scenario that I consider, a large portion of low-income single mothers' EITC payments is captured by employers through reduced wages. Workers who are EITC ineligible also see wage declines. By contrast, a traditional Negative Income Tax (NIT) discourages work, and so induces large transfers from employers to their workers. With my preferred parameters, $1 in EITC spending increases after-tax incomes by $0.73, while $1 spent on the NIT yields $1.39. (*JEL* H22, H23, H24, H31, J22)

Most means-tested transfer programs impose high effective tax rates on earned income. In recent decades, however, there has been a trend toward the imposition of labor supply conditions for the receipt of benefits. In the United States, traditional welfare was replaced with Temporary Assistance to Needy Families (TANF), which comes with time limits and work requirements, and the Earned Income Tax Credit (EITC) was repeatedly expanded. By 2000, spending on the EITC was 70 percent higher than on TANF (V. Joseph Hotz and John Karl Scholz 2003).

The EITC is often seen as an implementation of a Negative Income Tax (NIT), but its central feature distinguishes it. Whereas nonworkers receive the largest payments under the NIT, only families with earned income can receive the EITC. This feature ensures that the EITC encourages rather than discourages labor force participation among eligible individuals.[1]

Emmanuel Saez (2002) argues that the optimal income transfer program will resemble the EITC if labor supply decisions are made primarily on the extensive (participation) margin, whereas intensive (hours) responses lead to an optimal tax that more closely resembles the NIT. Given mounting evidence that labor market participation is far more elastic with respect to the wage than are hours among participants, Saez's analysis supports the view (also advanced by Robert K. Triest 1994; Jeffrey B. Liebman 2002; Nada Eissa, Henrik Jacobsen Kleven, and Claus Thustrup

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[1] This is true only for unmarried recipients. I discuss the incentives faced by married couples, as well as intensive margin incentives, later in paper.

Kreiner 2008; Richard Blundell and Andrew Shephard 2008) that the shape of the EITC schedule is a desirable one.

But Saez's analysis, like nearly all optimal tax analyses and discussions of the EITC, presumes that the incidence of taxes is entirely on workers. As Don Fullerton and Gilbert E. Metcalf (2002, 29) note, "this assumption has never been tested."[2] A basic result in the economics of taxation is that the economic incidence of taxes depends on the elasticities of supply and demand for the good being taxed and not on their statutory incidence. If demand is less than perfectly elastic, supply-side taxes are partially passed through to the demand side via changes in the equilibrium price. Effects on prices are of the opposite sign as those on supply, so any program that increases labor supply will lead to reduced pre-tax wages. This implies that employers of low-skill labor capture a portion of the intended EITC transfer. Moreover, because EITC recipients (primarily single mothers) compete in the same labor markets as others who are ineligible for the credit, wage declines extend to many workers who do not receive offsetting EITC payments. These unintended transfers limit the EITC's value as a tool for income redistribution. Recognizing the endogeneity of wages thus reduces the attractiveness of work-encouraging transfers like the EITC. But the practical importance of incidence effects is unclear.

In this paper, I show that incidence effects are extremely important to the evaluation of the EITC. With plausible labor supply and demand elasticities, the unintended consequences of the EITC operating through the pre-tax wage are large relative to the direct, intended transfers. Neglecting these wage effects leads to misleading assessments of the impact of a hypothetical EITC expansion on labor supply, incomes, and welfare.

I begin by extending the standard partial equilibrium tax incidence model to take account of important complexities in the labor market: tax schedules are nonlinear and heterogeneous across workers; labor is differentiated and imperfectly substitutable; and supply choices combine discrete (participate or not?) and continuous (how many hours to work?) decisions. I show that targeted work subsidies produce unintended transfers to employers, coming not just from targeted workers but also from ineligible workers in the same labor markets. The transfer to employers is largest when the subsidy induces large increases in labor supply and when demand is inelastic. It is paid primarily by targeted workers only when targeted and ineligible workers are poor substitutes in production.

I derive formulas for tax incidence that depend on the labor supply elasticity measures that are commonly obtained in empirical work: the elasticity of labor force participation with respect to the average tax rate on workers' earnings and the (uncompensated) elasticity of hours worked, conditional on participation, with respect to the marginal tax rate. Although both average and marginal tax rates vary substantially across even similarly skilled workers, I show that incidence calculations

[2] Patricia M. Anderson and Bruce D. Meyer (1997, 2000), Paul Bingley and Gauthier Lanot (2002), Jonathan Gruber (1994, 1997), and Jeffrey D. Kubik (2004) estimate tax incidence, generally finding that workers bear much, but not all, of the burden. Jeremy Lise, Shannon Seitz, and Jeffrey Smith's (2004) examination of the Canadian Self Sufficiency Project is the only evaluation of an income transfer program of which I am aware that considers general equilibrium effects. In that study, the sign of the net benefit of the program depends on whether general equilibrium effects are allowed.

can proceed based on aggregate data with only the mean rates within appropriately defined cells.

To evaluate the importance of incidence considerations, I contrast two alternative income transfer policies: a small EITC expansion and a comparably-sized NIT, both targeted at families with children. Using data from the 1993 March Current Population Survey, which describes the labor market immediately before a large EITC expansion in the mid-1990s, I simulate the impact on the female labor market of adding each program to the actual 1992 tax schedule. I examine effects on labor supply, earnings, and net transfers, both for all women and for women disaggregated by EITC eligibility (i.e., the presence of children), marital status, and skill.

I treat elasticities and other parameters as known.[3] While I consider a range of plausible values, I focus on cases in which labor supply is more elastic at the extensive margin than at the intensive margin. In this case, with fixed wages the EITC causes net increases in low-skilled women's labor supply, while the NIT reduces supply. Thus, Saez (2002) concludes that the optimal schedule resembles the EITC.

Most discussions of the elasticity implicitly assume that labor demand is infinitely elastic. The EITC induces women to supply more labor, and therefore yields an increase in incomes over and above the direct tax transfer. In my baseline simulation, I estimate that the incomes of low-skill mothers would rise by $1.39 for every dollar spent on the program. When I allow for a finite demand elasticity, however, I find that the EITC produces sizable reductions in equilibrium wages that offset many of its benefits to low-skill workers. With my preferred parameters, the net-of-tax incomes of women with children rise by only $1.07 for each dollar spent on the program. Moreover, this is accompanied by a decline of $0.34 in the net-of-tax incomes of women without children, which are pushed downward by falling wages and by reduced labor supply. The contrast with the NIT is dramatic. The NIT imposes positive tax rates on earnings, leading to net reductions in labor supply among eligible women and thereby to increased wages. A dollar of government expenditure on the NIT produces a $0.97 increase in the after-tax incomes of women with children and an increase of $0.42 for women without children.

After-tax incomes are a misleading guide to the relative welfare consequences of the EITC and NIT, as much of the change in incomes is offset by changes in the consumption of leisure.[4] Again using my preferred parameters, a dollar of EITC spending produces net increases in the welfare of women with children with cash value of only $0.83 (as compared with $1 when demand is perfectly elastic). Employers of low-skill labor capture $0.36 via reduced wage bills, while the welfare of (EITC-ineligible) childless women falls by the equivalent of $0.18. Moreover, this obscures the even worse welfare consequences for single mothers, the primary group targeted by the EITC. Fully 55 percent of the marginal EITC dollar given to this group

[3] A companion paper (Rothstein 2008) uses the actual mid-1990s EITC expansion to estimate the elasticities of labor supply and demand that are needed for incidence calculations. The results of that paper inform the choice of elasticity values here.

[4] In general, the effects of work-encouraging (respectively, work-discouraging) programs on incomes will exceed (fall short of) the effects on welfare, as the income measure does not account for the disutility of work. However, in the words of Timothy Besley and Stephen Coate (1995), "[t]here is little evidence that the poor's leisure is valued by policy makers." See also Besley and Coate (1992) and Robert A. Moffitt (2006).

is captured by employers through reduced wages, and single childless women lose almost exactly as much as single mothers gain. Again, the NIT offers a dramatic contrast. The welfare of women with children rises by the equivalent of \$1.32 and that of women without children by \$0.23, with transfers of \$0.55 from employers to their workers magnifying the direct transfer from the government.

There are several limitations to my analysis. First, I ignore the taxes that would be needed to finance the proposed EITC and NIT programs. These would presumably be levied on higher income taxpayers, though their incidence, too, is unclear. Second, I examine only the first-order effects of tax policy on wages, not second- and third-order effects on other prices. The analysis is thus not fully general equilibrium. Third, I neglect many of the complexities introduced by nonlinear income tax schedules. I implicitly assume that small tax changes will not lead workers to jump from one segment of the tax schedule to another. This is unrealistic, but is necessary to obtain simple expressions for incidence effects and is unlikely to substantially affect the results. Finally, I do not extend the analysis to derive the implications for the optimal tax schedule. At a minimum, however, my simulation results suggest caution in deriving policy conclusions from models with fixed wages. Allowing for plausible labor demand elasticities leads to substantial changes in the distribution of outcomes.

The paper proceeds as follows. In Section I, I develop the theoretical framework. The EITC program is described in Section II, where I also review the evidence on the EITC's labor supply effects. Section III describes the data and tax simulation. Section IV introduces the EITC and NIT policy alternatives. Section V describes the details of the simulation. Section VI presents results. Section VII concludes.

I. A Model of Tax Incidence

In this section, I develop a model of partial equilibrium tax incidence that is suitable to the complexities of the labor market. I begin with a simple textbook presentation, then gradually extend it to allow for heterogeneity across workers, non-proportional taxes, and distinct participation and hours choices.

A. *The Textbook Model*

I begin with constant-elasticity supply and demand functions for a homogenous good, with proportional taxes levied on the supplier:

$$L^S(w) = \alpha(w(1-\tau))^{\sigma} \quad \text{and} \quad L^D(w) = \beta w^{\rho}. \tag{1}$$

Here, w is the price faced by the demander, $w(1-\tau)$ is the net-of-tax price received by the supplier, and $\sigma > 0$ and $\rho < 0$ are the price elasticities of supply and demand, respectively. The equilibrium pre-tax price and quantity are

$$w = \alpha^{\frac{-1}{\sigma-\rho}} \beta^{\frac{1}{\sigma-\rho}} (1-\tau)^{\frac{-\sigma}{\sigma-\rho}} \quad \text{and} \quad L = \alpha^{\frac{-\rho}{\sigma-\rho}} \beta^{\frac{\sigma}{\sigma-\rho}} (1-\tau)^{\frac{-\sigma\rho}{\sigma-\rho}}. \tag{2}$$

Thus, the demand side (in the market for labor, employers) bears a share $\sigma/(\sigma - \rho)$ of taxes—$d\ln w = (-\sigma/(\sigma - \rho))\ d\ln(1 - \tau) \approx (\sigma/(\sigma - \rho))\,d\tau$—and the supply side bears the remaining $-\rho/(\sigma - \rho)$ share. The demand-side share represents a transfer to suppliers. The net transfer from the supply side is thus $Lwd\tau(-\rho/(\sigma - \rho))$. It is smaller in magnitude than the statutory tax whenever supply is at all elastic ($\sigma > 0$) and demand is less than perfectly elastic ($\rho > -\infty$). It is smallest when supply is highly elastic and demand highly inelastic.

B. *Incidence with Heterogeneous Workers*

Workers of different skills are not perfectly substitutable in production, and even workers of the same skill may face different tax rates. The textbook model can be extended to allow for distinct labor markets and for tax rates that differ across and within markets. For the moment, I maintain the assumptions of proportional taxes and a single labor supply elasticity. The supply of individual i working in skill-level labor market s is

$$L_{is} = \alpha_i (w_s(1 - \tau_{is}))^{\sigma}. \tag{3}$$

This expression allows tax rates to vary freely across individuals, but assumes that the pre-tax wage is constant across workers in the same market. The total labor supplied to market s is $L_s = \sum_i L_{is}$, with differential

$$d\ln L_s \equiv \frac{dL_s}{L_s} = \frac{1}{L_s}\sum_i dL_{is} = \frac{1}{L_s}\sum_i L_{is}\, d\ln L_{is}. \tag{4}$$

Using (3) and again approximating $d\ln(1 - \tau_{is}) \approx -d\tau_{is}$, this yields

$$d\ln L_s \approx \sigma\Big(d\ln w_s - L_s^{-1}\sum_i L_{is}\, d\tau_{is}\Big) = \sigma(d\ln w_s - d\tau_s), \tag{5}$$

where $d\tau_s \equiv L_s^{-1}\sum_i L_{is}\, d\tau_{is}$. Thus, aggregate labor supply to market s depends on the wage in that market and on the weighted mean tax rate in the market, using individuals' baseline labor supplies as weights.

Next, I need to model the determination of wages. I assume that workers within each market are perfect substitutes and that total effective labor supply is a Constant Elasticity of Substitution (CES) aggregate of supply in each market:

$$L = \Big(\sum_s \beta_s L_s^{\frac{1+\rho}{\rho}}\Big)^{\frac{\rho}{1+\rho}}. \tag{6}$$

Here, ρ is the elasticity of substitution between different types of labor. Cost minimization implies a set of labor demand functions of the form

$$L_s = \psi \beta_s^{-\rho} w_s^{\rho}, \tag{7}$$

where $\psi = \psi(w_1, w_2, \ldots, w_S)$ is a parameter reflecting the aggregate demand for labor. Note that w_t enters the expression for L_s, $s \neq t$, only through ψ. Because I focus on partial equilibrium incidence and not on changes in the price level, I neglect effects of taxes operating through ψ. I also assume that the β_s parameters are invariant.

Differentiating the inverse demand implied by (7) yields

$$d\ln w_s = \rho^{-1}\, d\ln \psi + \rho^{-1}\, d\ln L_s. \tag{8}$$

Combining (5) and (8), we obtain the quasi-reduced form

$$d\ln w_s \approx \frac{1}{\sigma + \rho}\, d\ln \psi + \frac{\sigma}{\sigma - \rho}\, d\tau_s \tag{9a}$$

$$d\ln L_s \approx \frac{\sigma}{\sigma + \rho}\, d\ln \psi + \frac{\rho\sigma}{\sigma - \rho}\, d\tau_s. \tag{9b}$$

As the mean tax rate in the labor market rises ($d\tau_s > 0$), relative supply of type-s labor falls (by $(\rho\sigma/(\sigma-\rho))\, d\tau_s < 0$) and relative pre-tax wages increase (by $(\sigma/(\sigma - \rho)) \times d\tau_s > 0$). Just as in the textbook model, the employer's share of the change in average taxes is $\sigma/(\sigma - \rho)$.

C. *Implications for Subgroup Analyses*

It can also be of interest to examine the distribution of impacts across defined subgroups within market s. Let $d\tau_{sg} \equiv (\sum_{i\in g} L_{isg})^{-1} \sum_{i\in g} L_{isg}\, d\tau_{isg}$ be the supply-weighted mean tax change for subgroup g in market s. The impact on subgroup g's net labor supply is:

$$d\ln L_{sg} \approx \frac{\sigma}{\sigma - \rho}\, d\ln \psi + \frac{\sigma^2}{\sigma - \rho}\, d\tau_s - \sigma d\tau_{sg}. \tag{10}$$

Thus, labor supply of subgroup g is declining in the mean tax rate in that subgroup (because $\partial \ln L_{sg}/\partial \tau_{sg} = -\sigma < 0$) but, conditional on this, increasing in the mean across the entire labor market (because $\partial \ln L_{sg}/\partial \tau_s = \sigma^2/(\sigma - \rho) > 0$).

Studies of the effects of tax reforms on labor supply frequently exploit contrasts between workers who plausibly participate in the same labor markets but are differently affected by a change in the tax regime (see, e.g., Eissa 1995, Eissa and Hilary Hoynes 2006a, Eissa and Hilary Williamson Hoynes 2004, Eissa and Liebman 1996, Bruce D. Meyer and Dan T. Rosenbaum 2001). These can identify the supply elasticity without accounting for wage effects. To see this, simply difference (10) between subgroups g_1 and g_2:

$$d\ln L_{sg_1} - d\ln L_{sg_2} = -\sigma\,(d\tau_{sg_1} - d\tau_{sg_2}). \tag{11}$$

Frequently, group g_2 is not directly affected by the tax change (i.e., $d\tau_{sg_2} = 0$). For example, in studies of the EITC's effect on labor supply, women without children, who are not eligible for the EITC, are often used as a "control" group. This terminology makes it seem as if the effect on the "treatment" group's labor supply is $-\sigma d\tau_{sg_1}$. This would be correct if wages were fixed. But with general equilibrium effects, this can be quite misleading (James J. Heckman 1996). By (10), the net effect on group g_1's labor supply (neglecting changes in the price level) is

$$(12) \qquad d\ln L_{sg_1} = \left(\frac{\sigma}{\sigma - \rho}\frac{L_{sg_1}}{L_s} - 1\right)\sigma d\tau_{sg_1}.$$

This can be quite different from the partial equilibrium labor supply effect if the taxed group is a large share of labor market s. Moreover, the "control" group g_2's supply changes as well, by $(\sigma^2/(\sigma - \rho))\ (L_{sg_1}/L_s)\, d\tau_{sg_1}$. By (9a), if $d\tau_{sg_1} > 0$ (< 0), both groups will see rising (declining) wages.

Now imagine varying groups' shares of the labor market, L_{sg_1}/L_s, holding $d\tau_s = (L_{sg_1}/L_s)\ d\tau_{sg_1}$ constant. That is, we compare a large tax cut targeted to a small group with a smaller cut spread across a larger group. The effects on employers and on group g_2's labor supply will be the same in either case, but the distribution of transfers will not. If group g_1 comprises the full labor market (i.e., $L_{sg_1} = L_s$), the full transfer to/from employers comes from this group, whose wages fall by $(\sigma/(\sigma - \rho))\ d\tau_{sg_1}$. As the targeted group's share of the skill-s labor market falls, however, group g_2 bears an increasing share of the transfer to employers.

D. *Nonlinear Tax Schedules*

Finally, I extend the model to a nonlinear tax schedule. Let the tax paid by individual i, be an arbitrary function of individual earnings $y_i \equiv L_i w_i$, nonlabor income R_i (assumed to be exogenous), and demographic characteristics X_i: $T_i = T(y_i, R_i, X_i)$. The individual's labor supply decision will depend on the marginal tax rate on earnings, $MTR_i \equiv \partial T/\partial y_i$, and, potentially, on other aspects of the tax schedule. For example, a discrete choice between working zero hours, which provides after-tax income $R_i - T(0, R_i, X_i)$, and working $h > 0$ hours for after-tax income $R_i + hw_i - T(hw_i, R_i, X_i)$ presumably depends on the average tax rate over the 0 to h range, $ATR_i \equiv (hw_i)^{-1}[T(hw_i, R_i, X_i) - T(0, R_i, X_i)]$.

It is straightforward to extend the incidence model to the nonlinear tax case so long as $d\ln L_{sg}$ is linear in $d\ln w_s$ and a set of tax parameters $\{d\tau_{sg1}, \ldots, d\tau_{sgk}\}$.[5] Assume

$$(13) \qquad d\ln L_{sg} = \sigma_w\, d\ln w_s - \sigma_1 d\tau_{sg1} - \cdots\ \sigma_k d\tau_{sgk}$$

[5] This is a nontrivial assumption, as in many cases (e.g., piecewise linear tax schedules) standard utility functions will not yield labor supply functions of this form. Equation (13) is perhaps best seen as a first-order linear approximation to the true nonlinear labor supply function.

and labor demand as in (7). By (8), the impact of a tax shock on wages is proportional to the partial effect of the shock on labor supply, holding wages constant:

$$d\ln w_s = \frac{1}{\sigma_w + \rho} d\ln \psi + \frac{1}{\sigma_w + \rho} d\ln \beta_s + \frac{\sigma_1}{\sigma_w + \rho} d\tau_{s1} + \cdots + \frac{\sigma_k}{\sigma_w + \rho} d\tau_{sk}. \tag{14}$$

As before, the tax rates in (13) and (14) are the hours-weighted averages across workers in market s.

Empirical researchers often estimate the effects of changes in average and marginal tax rates on labor force participation and on average hours among participants, respectively. The current framework can be used to incorporate these extensive and intensive responses. I neglect income effects here. The system is extended to include them in the online Appendix. Let p_{sg} be the participation rate of group g in market s, and let h_{sg} represent average hours among participants. Total labor supply in the group is therefore $L_{sg} = N_{sg} p_{sg} h_{sg}$, where N_{sg} is the number of individuals in the group. Let σ_e and σ_i be the extensive- and intensive-margin elasticities, respectively. Letting $dMTR_{sg}$ and $dATR_{sg}$ be the change in mean marginal and average tax rates in the subgroup (as before, weighted by hours worked), this means that $d\ln h_{sg} = \sigma_i(d\ln w_s - dMTR_{sg})$ and

$$d\ln p_{sg} = \sigma_e d\ln (h_{sg} w_s (1 - ATR_{sg})) \tag{15}$$

$$\approx \sigma_e (1 + \sigma_i)\, d\ln w_s - \sigma_e \sigma_i dMTR_{sg} - \sigma_e dATR_{sg}. \tag{16}$$

The overall change in labor supply in response to a tax change is thus

$$d\ln L_{sg} = d\ln p_{sg} + d\ln h_{sg} = (\sigma_i + \sigma_e + \sigma_i \sigma_e)\, d\ln w_s - \sigma_i (1 + \sigma_e)\, dMTR_{sg} - \sigma_e dATR_{sg}, \tag{17}$$

and the reduced-form effect of the tax change on wages is

$$d\ln w_s = \frac{1}{\sigma_i + \sigma_e + \sigma_i \sigma_e - \rho} [d\ln \psi + (\sigma_i + \sigma_i \sigma_e)\, dMTR_s + \sigma_e dATR_s]. \tag{18}$$

Several aspects of these equations are of note. First, note that the product of the intensive- and extensive-margin elasticities appears in several places. This reflects the fact that any change in hourly after-tax wages leads to an intensive-margin response, and that this in turn changes the incentive to participate. Second, all of the tax rates are hours-weighted averages among workers in the cell. The implicit assumption is that the change in ATRs and MTRs faced by working women in an $s - g$ cell captures the change in the labor supply incentives faced by nonworkers. This is questionable, but may be a tolerable approximation. Third, if $\sigma_e = 0$, (17) and (18) reduce to the simpler expressions in Subsection IB, using only σ_i and the marginal tax rate. Similarly, if $\sigma_i = 0$, we obtain the same expressions from Subsection B, this time using σ_e and the average tax rate. Fourth, the same simplification does not arise when only one of the tax rates is changed but both elasticities are nonzero. A change in either tax rate influences both extensive- and intensive-margin labor supply decisions via its effect on wages. Finally, wage effects of tax changes are proportional to their impacts on labor supply. As discussed below, the EITC has opposite effects on MTRs and ATRs for many women. The net impact on the wage will depend on the sum of extensive- and intensive-margin labor supply responses.

E. *Continuous Skill Distributions*

The above model assumes that each worker participates in one of a number of distinct labor markets, and that an increase in labor supply in one of these markets has the same proportional effect on wages in every other market. In analyses of labor supply responses that do not examine wage effects, it is conventional to define labor markets by observed education and experience. This is less attractive for demand analyses. In the CES production function used here, a shock to the labor supply of young high school dropouts must have the same proportional effects on the wages of young high school graduates as on those of older college graduates.

An alternative is to treat skill as a continuous variable. Coen N. Teulings (1995, 2005) develops a model of job assignments when "close" skill types are more substitutable than those further apart in the distribution. In his model, the labor supply that determines the wage of a worker with skill s (in, e.g., the inverse version of (7)) is the local average around s, with more weight on skill levels closer to s. Moreover, in any cross section there is a one-to-one mapping from wages to skills. Thus, we can continue to use the above reduced-form equations for taxes and labor supply by simply redefining the market-level tax shock that is relevant to worker i as the local average of the change in tax rates among workers with wages close to w_i:

$$d\tau_{s(i)} \equiv \frac{\sum_j L_j K(\omega^{-1} d(w_i, w_j))\, d\tau_j}{\sum_j L_j K(\omega^{-1} d(w_i, w_j))}.$$

Here, $d(w_0, w_1)$ representes the distance from w_0 to w_1 in some metric, $K(\cdot)$ is a kernel function, and ω is a bandwidth.[6] As before, this local average is weighted by labor supply.

My main estimates use the conventional education-experience categorization. I also present estimates from the continuous skill model—with $d(w_i, w_j) \equiv |\ln w_i - \ln w_j|$, the Epanechnikov kernel, and a bandwidth of 0.1—as a specification check. Rothstein (2008) explores this model more fully.

[6] This is formally identical to a Nadaraya-Watson nonparametric estimator of the mean tax rate among wage-w_i workers. In nonparametric analyses, one would allow ω to shrink toward zero as the sample size grows. In the Teulings model, ω is an economic parameter and should not vary with the sample size.

Table 1—The EITC Schedule

If y is	The credit is	And the marginal tax rate is
Less than or equal to 0	0	0
Between 0 and C/τ_1	$\tau_1 y$	$-\tau_1$
Between C/τ_1 and p	C	0
Between p and $p + C/\tau_2$	$C - \tau_2(y - p)$	τ_2
Greater than $p + C/\tau_2$	0	0

II. An Overview of the EITC

The EITC is a refundable tax credit that depends on a family's total earnings according to a four-segment schedule. Four parameters define the credit: a phase-in rate τ_1, a maximum credit C, an income level p at which the credit begins to phase out, and a phase-out rate τ_2. Table 1 describes the credit and marginal tax rate for a family with earned income y, depending on the range in which y falls.[7]

All four parameters vary across family types and over time. In 1992, families without children were ineligible, and families with more than one child were slightly more generously treated (higher C, τ_1, and τ_2) than families with just one. Importantly, the schedule has never depended on the number of workers in the household.[8] Figure 1 displays the 1992 schedule. Eissa and Hilary W. Hoynes (2008) review the EITC's dramatic expansion over time. In the mid-1990s, the schedule was made much more generous, primarily by increasing C, τ_1, and τ_2 (i.e., by stretching the trapezoids in Figure 1 vertically). Subsequent expansions have instead taken the form of shifting the kink points outward (i.e., by increasing C and p, stretching the trapezoids horizontally).

Liebman (1998) and Hotz and Scholz (2003) discuss the EITC's labor supply incentives. In the phase-in range, marginal tax rates (MTRs) are negative and substitution effects should lead to increased labor supply, but income effects may partially offset this. In the plateau region, MTRs are zero, and income effects are negative. In the phase-out, substitution and income effects reinforce each other, both leading to reductions in labor supply. Thus, traditional labor supply models with continuous hours choices suggest a net negative labor supply effect.

But the annual hours distribution is extremely concentrated. Seventy-four percent of women who work at all in a year work at least 48 weeks, and 52 percent work between 38 and 42 hours per week.[9] If the participation decision is discrete, average tax rates (ATRs) on a woman's potential earnings may be more important than MTRs. The EITC produces negative ATRs for all primary earners with potential

[7] If AGI—typically earnings plus nonlabor income—is above p, the credit can be less than is shown in Table 1. If AGI is above $p + C/\tau_2$, the family receives no EITC.

[8] Since 2002, there have been different schedules for married-couple and single tax filers, though even the married-couple schedule is invariant to the distribution of earnings within the household. Before 2002, the same schedule applied to singles and married couples.

[9] Among single mothers who did not attend college, a group quite likely to receive the EITC, 68 percent work a full year and 57 percent work full time. The source is the 1993 March Current Population Survey sample.

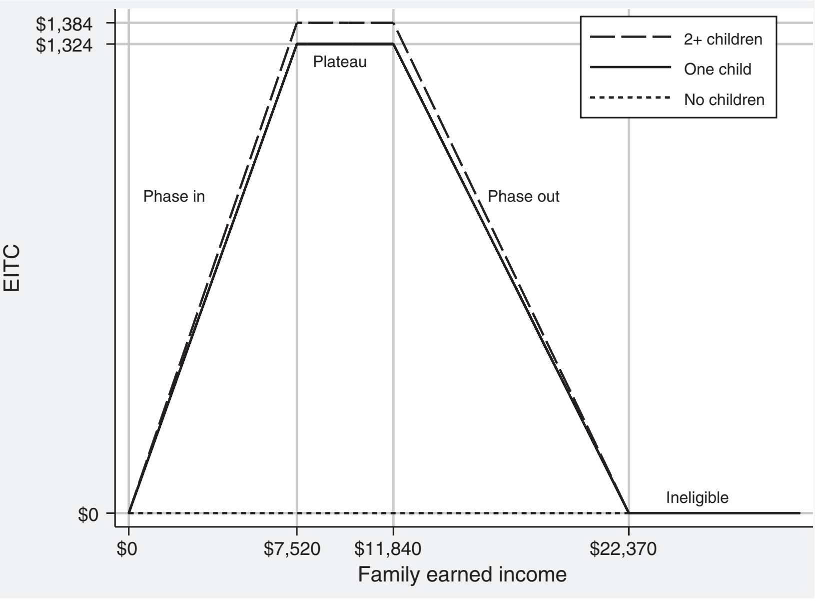

Figure 1. 1992 EITC Schedule

earnings below $p + C/\tau_2$, so should have induced increased participation from single parents. Among secondary earners, by contrast, nearly all of the incentives are toward reduced labor supply on both the extensive and intensive margins (Eissa and Hoynes 2004).[10]

The empirical literature on labor supply is huge. Jerry A. Hausman (1985), John Pencavel (1986), Richard Blundell and Thomas MaCurdy (1999), and Moffitt (2002) provide reviews. Three frequent findings are: that men's labor supply is quite unresponsive to changes in the wage or in nonlabor income; that women's labor supply is more elastic; and that low-skill workers' supply is more elastic than that of high-skill workers. As the EITC targets low-wage women, we can expect the relevant elasticities to be fairly high.

A series of recent studies uses expansions of the EITC to identify supply elasticities, typically contrasting the experiences of women with and without children. These are reviewed by Eissa and Hilary W. Hoynes (2006b), Eissa and Hoynes (2008), and Hotz and Scholz (2003). Studies of single women uniformly find that the EITC expands single mothers' labor market participation, consistent with a substantial extensive margin elasticity (Eissa and Liebman 1996, Meyer and Rosenbaum 2001). Also consistent with this, Eissa and Hoynes (2004) find that the EITC reduces participation among married women. Hotz and Scholz (2003) summarize the evidence as indicating an elasticity of women's labor force participation with respect to net-of-tax income between 0.69 and 1.16.

[10] If the husband's earnings are above C/τ_1, the wife faces a nonnegative MTR from her very first dollar of earnings. She also faces a positive ATR whenever the husband's earnings are below $p + C/\tau_2$ but her potential earnings would place the family's total income above p.

Another clear result is that effects on hours worked conditional on participation are comparatively small. Eissa and Hoynes (2006a) find an intensive-margin wage elasticity for low-skill married women of 0.07 in one specification and 0.44 in another. These are if anything larger than those reported elsewhere (e.g., Eissa and Liebman 1996; Meyer and Rosenbaum 2001). In a review, Meyer (2007) notes that the "lack of an 'hours effect' (of the EITC) is one of the more puzzling, yet robust findings in the literature." Emmanuel Saez (2009) finds evidence of bunching around the EITC kink points only among the self employed, again consistent with a small intensive-margin elasticity.

Combining the two margins, it is clear that the net effect of the EITC is to increase single mothers' total labor supply (Michael Keane and Moffitt 1998) and to reduce that of married women with children (Eissa and Hoynes 2004).[11] Effects on the latter group tend to be smaller than those on the former, and, in any event, there are fewer married than single EITC recipients. Thus, the net effect on total labor supply should be positive, but few studies examine the two groups in tandem.

Only a few studies have examined the wage impacts of the EITC. The contrast between women with and without children cannot identify these effects if both participate in the same labor markets. Thus, only weaker identification strategies are available. Rothstein (2008) compares the wage trends for workers with different initial wages, who plausibly participated in distinct skill-level labor markets, surrounding a large EITC expansion. Allowing for skill biased technical change, he finds wage responses consistent with a demand elasticity of -0.3. Andrew Leigh (forthcoming) contrasts workers in different states, under the assumption that labor markets are geographic, and also estimates $\rho = -0.3$.[12] Ghazala Yasmeen Azmat (2006) studies the wage impacts of an analogue to the EITC in the United Kingdom, but focuses on the effect on the wages of recipients relative to those of nonrecipients in the same labor markets. In the competitive model outlined above, this effect is necessarily zero. In this study, I sidestep the difficult challenge of identifying the demand elasticity. Rather, I take this as a parameter and simulate the implications for the EITC's incidence. I use $\rho = -0.3$ as a reasonable value, though I explore other values as well.

III. Data

I use data from the 1993 Annual Demographic Supplement to the Current Population Survey (CPS), the March survey, to simulate EITC eligibility and to calibrate the impacts of the counterfactual policy changes discussed below. The 1993 data contain information about labor market participation and annual earnings and wages from 1992. I select this year because it immediately predates the large EITC expansion that began in the 1993 tax year, though there is no reason to expect that the simulation results below would be importantly sensitive to this choice.

[11] The Web Appendix discusses evidence regarding income effects.

[12] Leigh (forthcoming) computes this as the ratio of reduced-form effects of the EITC on labor supply (of eligible and ineligible workers combined) and wages. Leigh also interprets his results as indicating that all (or more than all) of the EITC is shifted onto employers, however. This would imply inelastic demand ($\rho = 0$) and no reduced form effect on net labor supply of eligible women.

Table 2—Distribution of Families with Children across EITC Segments in 1992

	All education levels			Less than a high school diploma		
		Married with kids			Married with kids	
	Single mothers (1)	Wife works (2)	Wife doesn't work (3)	Single mothers (4)	Wife works (5)	Wife doesn't work (6)
N	7,005	13,139	5,221	1,760	1,261	1,355
Percent in each EITC segment, observed earnings						
Zero earnings	30	0	11	60	0	24
Phase-in	19	2	7	19	8	13
Plateau	10	2	5	8	8	11
Phase-out	23	10	18	11	25	26
Earnings too high	18	86	59	2	60	27
Families with positive female earnings						
Percent with ATR > 0	0	26		0	44	
Percent with ATR < 0	75	7		94	19	

Notes: See text for sample description. Families without children and father-only families are excluded. "ATR" = "Average Tax Rate," calculated on a working woman's earnings and treating both nonlabor income and husband's earnings (if any) as fixed.

I form tax filing units consisting of the family head and his or her spouse, if present. Following the EITC rules, the family's credit is based on the number of resident children under 18 years old or under 24 years old and enrolled in school.[13] I compute hourly wages as the ratio of annual earnings to annual hours. I exclude families in which the woman's hourly wage is above \$100 or below \$2, or she has negative self-employment income.

Using the CPS sample, I simulate the EITC for which each family would have been eligible in 1992 given its observed earnings.[14] I use this to compute the marginal tax rate (MTR) that each working woman faces and the average tax rate (ATR) on her earnings. I use a "secondary earner" model, assuming that women treat their husbands' wages and earnings as exogenous to their own labor supply decisions. Accordingly, I calculate the ATR on a woman's earnings as the difference between the (negative of) the EITC due to the family with and without her earnings, as a share of those earnings. Both MTRs and ATRs incorporate only the federal EITC. I neglect payroll and income taxes as well as state-level EITCs and other transfer programs.

Table 2 presents an empirical analysis of the distribution of women with children across EITC segments. I divide women by marital status and, for married women, by whether they worked at all during the year. About 30 percent of single mothers do not work. Among those that do, slightly more are in the phase-out (positive MTR) region than in the phase-in (negative MTR). In the subset without high school

[13] In complex households, this only approximates the tax units used for EITC eligibility. For example, I assign a child in a multigenerational household to her mother, when in fact she might be claimed on her grandmother's return.

[14] The EITC also depends on the family's Adjusted Gross Income (AGI). I use Taxsim (Daniel Feenberg and Elizabeth Coutts 1993) to compute this, given the relevant variables that are available in the CPS. All further calculations use my own EITC calculator.

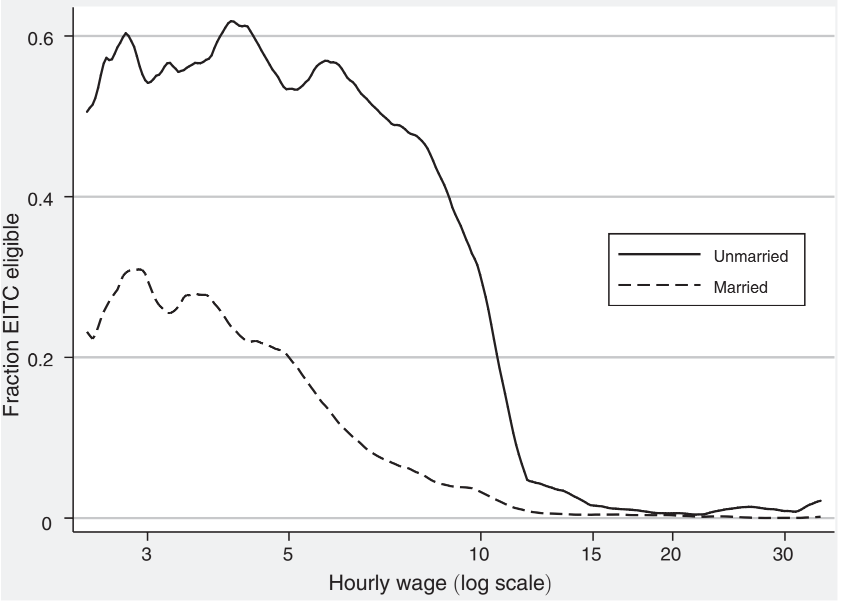

Figure 2. Fraction of Working Women Eligible for EITC, by Marital Status and Hourly Wage

Note: Series are estimated via local linear regressions using an Epanechnikov kernel and bandwidth = 0.05 log points.

diplomas (column 4), the nonparticipation share is much higher, and a larger share are in the phase-in than in the phase-out region. Among married couples, the majority have incomes too high to receive the EITC. Those who are eligible are much more likely to be in the phase-out than in the phase-in range, even when I limit attention to families in which the woman does not have a high school diploma. The final rows of the table show the fraction of working women for whom the EITC induces a positive or negative ATR. All single women who are eligible for the EITC face negative ATRs, but the presence of male earnings means that far more working, married women face positive than negative ATRs.

The model in Section I indicates that the EITC's impact depends on the density of EITC-affected women in the labor markets in which they participate. Figure 2 shows the fraction of working women at each hourly wage who are eligible for a positive EITC, separately for single and married women.[15] Throughout the bottom of the wage distribution, the majority of single women, and essentially all single mothers, receive the EITC. The share of married women receiving the credit is lower and drops off quickly at wages above about \$5. Note, however, that many married women who do not receive the EITC nevertheless face positive ATRs, as their families would be eligible for credits if the women did not work.

[15] These are computed by local linear regressions of an indicator for a positive simulated EITC on the log hourly wage, separately for married and single mothers. I use an Epanechnikov kernel and a bandwidth of 0.05. The regressions are weighted by annual hours worked. Women with zero hours are excluded.

IV. Counterfactual Policies

I contrast two counterfactual policy reforms, each treated as additions to the 1992 tax schedule. The first is an infinitesimal proportional expansion of the EITC. A family whose credit was c under the 1992 schedule would instead receive $c(1 + \varepsilon)$, with ε chosen to yield total incremental cost (over the sample described in Section III, excluding single fathers) to the government of \$1.[16]

I contrast this EITC expansion with a similarly infinitesimal NIT. An NIT has only two parameters: a baseline credit C^{NIT}, and a rate τ^{NIT} at which it is taxed away. A family with earned income $y < C^{NIT}/\tau^{NIT}$ receives a credit of $C^{NIT} - y\tau^{NIT}$ and faces marginal tax rate τ^{NIT}. A family with income above this point gets nothing. Importantly, families with zero labor income receive the full credit C^{NIT} but are ineligible for the EITC. An NIT produces positive MTRs and increases in virtual income for all recipients. It also produces positive ATRs for all working, single women, whether or not they actually receive the NIT, and for any married woman whose husband earns less than C^{NIT}/τ^{NIT}. The NIT thus unambiguously reduces labor supply.

To make the two policies as comparable as possible, I limit my hypothetical NIT to families with children. I set the ratio of C^{NIT} for families with one child and with two or more children to be the same as that for C under the 1992 EITC, and set τ^{NIT} so that the NIT phases out entirely at the same income level as the EITC (i.e., so that $C^{NIT}/\tau^{NIT} = p + C/\tau_2$). This leaves one free parameter. I choose this to yield a total budgetary cost of \$1, just as for the EITC alternative. In my simulations, over 40 percent of NIT spending goes to families with zero labor income. As a consequence, the NIT has a much smaller impact on the labor market.[17]

Figure 3 shows the tax schedules in the two proposed policies. Figure 4 shows the change in mean tax rates that single and married mothers at each hourly wage would face under each policy, assuming that labor supply and wages were unchanged. In each case, I consider the proposed policies in isolation, and ignore the effects of other taxes (including the actual 1992 EITC) and transfers. The figure shows that the EITC expansion would reduce the ATR substantially (relative to the amount spent) for the average low-wage single mother. MTRs would fall as well at the lowest wages but would rise at wages between about \$6 and \$11. For married women, the EITC expansion would increase ATRs and MTRs a bit throughout the bottom of the wage distribution. The NIT alternative would increase MTRs and ATRs for all low-skill women, more so for those who are unmarried. But the magnitude of these changes would generally be smaller than those produced by the EITC expansion.

[16] This hypothetical expansion differs slightly from the large expansion that took place between 1992 and 1996, which moved the kink points somewhat downward, was proportionately more generous to two-child families than to one-child families, and added a small credit for families without children.

[17] An NIT that spends as much on *working* families as my hypothetical EITC expansion would cost \$1.79. As all of the incidence formulas in Section I are linear in the tax rate, the NIT results below should be multiplied by 1.79 to obtain the effects of a policy of this size.

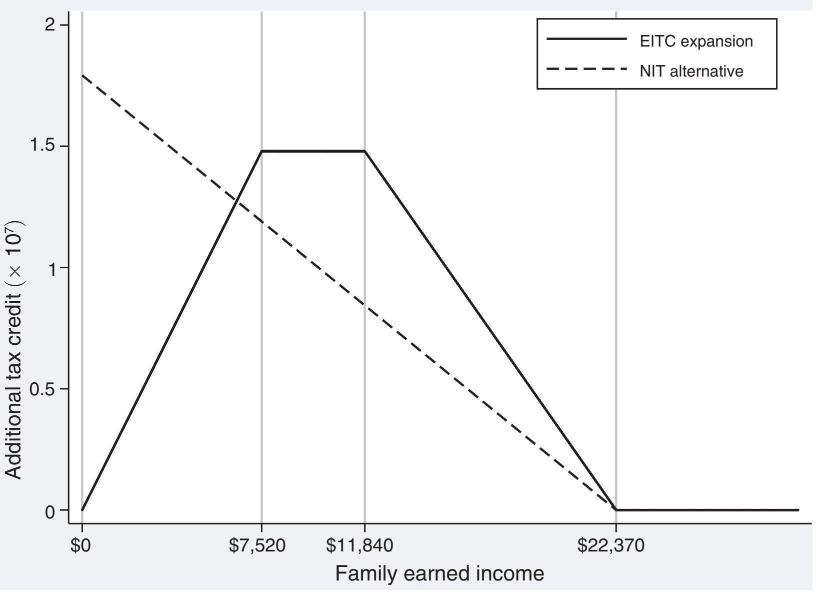

Figure 3. Tax Schedules Associated with Proposed EITC Expansion and NIT Alternative

Note: Figure indicates additional credits available (multiplied by 10^7) as a function of earned income for families with one child when a total of $1 is devoted to expanding the EITC or to adding an incremental NIT.

V. Calibration Methods

The equations in Section I provide simple expressions for changes in the relevant outcomes—participation rates, average hours among participants, and hourly wages—as functions of changes in tax rates. My simulation of the impact of the two proposed tax policies thus proceeds in three steps:

- Specify the relevant labor markets.
- Estimate changes in mean average and marginal tax rates within each market (and for relevant subgroups), given observed distributions of labor supply and wages.
- Compute labor market responses, given specified elasticities of supply and demand.

I discuss each step in turn.

A. *Specification of Labor Markets*

In the model above, workers are separated into distinct labor markets. Daniel S. Hamermesh (1993) discusses the aggregation of workers into discrete groups for analyses of labor demand. He notes that the appropriate partition should yield cells

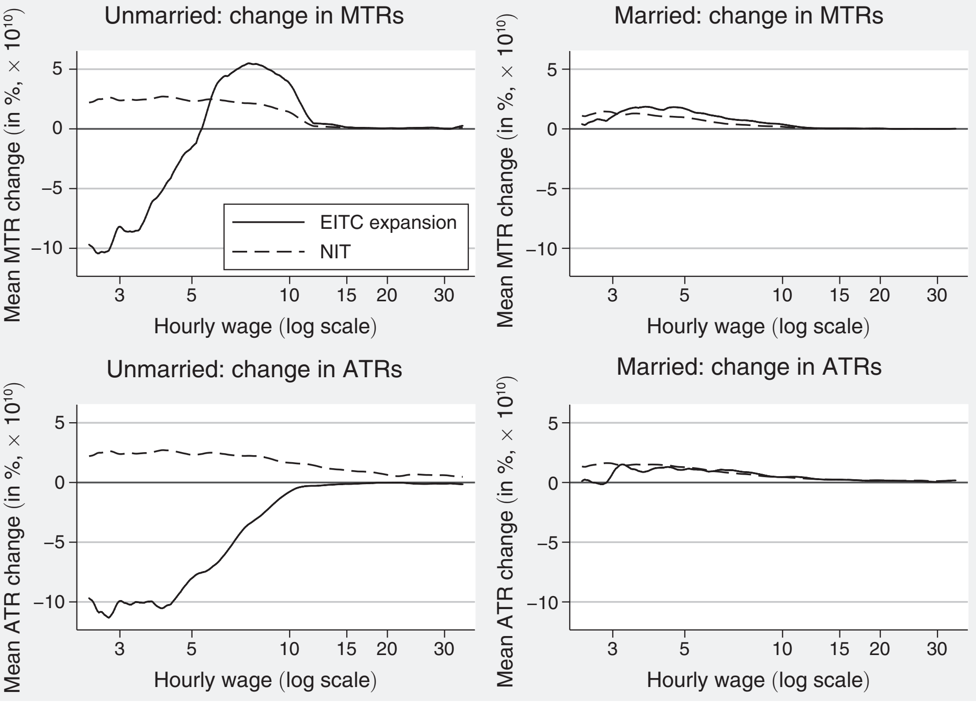

Figure 4. Changes in Mean Marginal and Average Tax Rates Associated with Proposed Policies, by Women's Marital Status and Hourly Wage

Notes: Figure indicates the mean simulated change in tax rates (in percentage points, multiplied by 10^{10}) on women's earnings when a total of $1 is devoted to expanding the EITC or to adding an incremental NIT. Tax rates are computed using a secondary earner model, and treat husband's earnings and nonlabor income as invariant to the program. Means are computed over families with children and positive female earnings, and are estimated via local linear regressions using an Epanechnikov kernel and a bandwidth of 0.05 log points.

within which workers are highly substitutable. Most of the studies of the demand for heterogeneous labor that Hamermesh (1993) reviews disaggregate workers by age, race, sex, or occupation. For the current purposes, there is little harm in over-dividing. If workers in two cells are perfectly substitutable, demand for workers in each cell will be highly elastic with respect to the wages in that cell, holding other wages constant. The employer share of the tax burden would be determined by the (less) elastic demand for workers in a super-cell that aggregates the two perfect substitutes.

Because the EITC primarily affects women, I focus exclusively on the labor market for women. Throughout, I assume that men and women participate in distinct labor markets.[18] In my primary analyses, I subdivide the female labor market by the intersection of four education categories (less than high school, a high school diploma but no college, some college but no degree, and college graduates), five-year

[18] If this is incorrect, I will understate the size of each skill-level labor market and overstate the change in market-level mean tax rates. This will lead me to overstate the effect on pre-tax wage rates but to understate the size of the group affected by any wage changes. These balance out, so the employer share of the tax incidence would be unaffected. However, I will underestimate the share of the transfer to (from) employers that comes from (goes to) nonrecipients of the EITC and NIT programs.

age intervals, and marital status. The first two are conventional skill proxies (see, e.g., George J. Borjas 2003). The last is motivated by Rothstein's (2008) finding of substantial divergence between the wages of similarly skilled single and married women in the mid 1990s.

In sensitivity analyses, I consider several alternative categorizations. First, I consider markets that are segmented by geography. I define geographic markets by state and, within state, by whether the individual lives in a metropolitan area or not. I assume that each geographic market is further divided by whether workers have some college (or more) or not. Second, I use observed hourly wages as proxies for skill and assume that workers compete only with other workers with similar hourly wages. This analysis uses the continuous skill distribution discussed in Section IE. Finally, for each labor market proxy, I explore separating or pooling the markets for single and married women.

B. *Simulated Tax Rate Changes*

For each family in the CPS sample described above, I simulate eligibility for each of the proposed tax credits, using observed labor supply and wages. As discussed above, I treat married women as secondary earners in computations of average tax rates. I then average across women in the same market to obtain mean marginal and average tax rates. As discussed in Section I, these averages are weighted by annual hours of work.

I treat all intensive margin responses as occurring along linear budget constraints that coincide with the segment of the tax schedule on which the individual is observed. Hausman (1985) emphasizes that some individuals will jump from one segment to another in response to a tax change. An example would be someone who would reduce her hours, lowering her total earnings from just above $22,370 to just below it, in order to qualify for the proposed EITC or NIT. My strategy treats her MTR as zero, when in fact it would be positive at her new labor supply. Two defenses can be offered for my approach, which will tend to overstate labor supply responses to tax changes around convexities in the budget set (points where MTRs increase as earnings rise) and understate responses around nonconvex kinks (where MTRs decline).[19] First, the evidence suggests that behavioral responses to nonlinearities in the tax schedule are relatively small. Saez (2009), for example, finds no evidence of bunching around convex kinks in the tax schedule. Second, the consequences for my analysis of mis-measuring any individual's tax rate are minor. The key rates are the means within relatively large cells, and these are likely to be reasonably accurately proxied by my no-bracket-switching simulations.

[19] The alternative would be to fully model the individual labor supply choice under the counterfactual tax regimes. This would require assumptions about the full distribution of utility function parameters. However, the utility specifications that have been used in the structural labor supply literature have a difficult time explaining the common reduced-form result that extensive margin supply responses are much larger than those on the intensive margin (Meyer 2002). Absent better understanding of this issue, it seems best to stick to a labor supply function that is consistent with the evidence, without attempting to derive this from a behavioral model.

C. *Calibration of Labor Market Responses*

Given labor market definitions and estimates of the change in mean tax rates in each labor market and subgroup, it is straightforward to apply equations (18) and (17) to obtain the changes in labor market participation, hours conditional on participation, and wages that the two proposed transfer programs would produce. I assume that changes in participation rates will not lead to changes in the mean wage of workers in the cell through composition effects (i.e., selection), and that any composition effects on mean hours are captured by the intensive margin elasticity.[20] Finally, I assume that nonlabor income, family structure, and male earnings are invariant to the tax changes under consideration.

My baseline estimates assume that the elasticity of women's participation with respect to average wages is 0.75, that the elasticity of hours with respect to marginal wages conditional on working is zero, and that the own-price elasticity of demand for labor within each market is -0.3. Income effects are assumed to be zero, though I present specification checks that allow for them.

The supply elasticities roughly correspond to consensus estimates in the literature reviewed in Section II. But the demand elasticity merits further discussion, as it is central to the present analysis and much less is known about it. My parameter choice corresponds to Hamermesh's (1993, 1995) "best guess" at the elasticity of demand for homogeneous labor. He suggests a plausible range of -0.15 to -0.75. Although one might expect the demand for workers of particular types to be more elastic, the estimates that Hamermesh reviews do not show clear evidence of this. Moreover, Hamermesh's guess corresponds closely to the estimates discussed in Section II that exploit EITC expansions.

By contrast, more recent estimates indicate a much wider range of possible values. Generally, studies that exploit exogenous shifts in wages tend to find small quantity responses, consistent with inelastic demand, while those that exploit shocks to labor supply (typically from immigration) find small wage responses that indicate more elastic demand. Thus, for example, the small-to-zero employment effects of minimum wage increases found by David Card and Alan B. Krueger (1995) would suggest quite inelastic demand for low-skill labor (i.e., ρ close to zero). And in a study of worker's compensation insurance, Jonathan Gruber and Krueger (1991) estimate a demand elasticity of -0.5. By contrast, the immigration literature is divided between estimates that immigration has essentially no effect on native wages (e.g., Card 1990), indicating $\rho = -\infty$, and those that indicate small effects consistent with own-wage labor demand elasticities around –2.5 (Borjas 2003, Borjas and Lawrence F. Katz 2007).[21]

I have conducted extensive sensitivity analyses that vary the elasticity parameters. In the results, I present simulations that use elasticities of participation with respect to average wages (i.e., extensive-margin elasticities) of 1, 0.75, and 0.5; elasticities of

[20] This is consistent with most reduced-form analyses, which focus on hours conditional on participation.

[21] Card (2009) argues that with an appropriate definition of skill (focusing on the high school-college distinction rather than the high school dropout-diploma distinction), immigration has not led to a substantial relative increase in low-skill labor supply. This suggests that the immigration studies that focus on the impact on relative wages of skilled and unskilled native workers have little power for estimation of ρ.

hours with respect to marginal wages (i.e., intensive-margin elasticities) of 0, 0.25, and 0.5; and demand elasticities of $-\infty$, -1, -0.3, and 0.

As seen in Figure 4, the EITC and NIT policies have very different effects on the MTRs and ATRs faced by their recipients, particularly their unmarried recipients. Before jumping in to the evaluation of these policies, it is worth considering the implications of different elasticity parameters for the net impact of across-the-board increases in MTRs and ATRs. Table 3 reports the reduced-form effects of such increases on pre-tax wages and labor supply (combining employment and hours among the employed), using equations (18) and (17). The less elastic is demand, the smaller the net labor supply response to any tax change and the larger the wage response. Higher extensive-margin supply elasticities produce larger reductions in labor supply in response to tax increases and (for $\rho > -\infty$) larger increases in pre-tax wages. The effects of increasing the intensive-margin supply elasticity are more complex, as even when ATRs increase with no change in the MTR, wage responses can lead to intensive-margin increases in hours.

VI. Results

I begin by analyzing the case of perfectly elastic demand ($\rho = -\infty$). This extreme case helps make clear the direct labor supply effects of the two proposed tax policies, as there are no indirect effects when the labor market can absorb arbitrary supply shocks without changes in wages. Table 4 presents the simulated labor supply effects, using extensive margin supply elasticity $\sigma_e = 0.75$ and intensive margin elasticity $\sigma_i = 0$.[22] Panel A describes the proposed EITC expansion, while panel B describes the NIT. All effects are characterized in terms of the total amount of additional (or reduced) earnings due to the addition of the small hypothetical programs. Recall that each program is calibrated so that the total tax expenditure is $1.

The first two rows of each panel describe these tax transfers. By construction, all EITC spending goes to families with positive earnings. In my simulation, 55 cents of every dollar goes to single mothers, and 45 cents to married couples. The proposed NIT would give a notably larger share of funds to single mothers, 67 cents per dollar spent. Forty-four percent of the spending on the NIT, however, goes to families without earned income, and over three quarters of this spending goes to single mothers.

The next row presents the effects on the labor market. By construction, the only responses in this simulation are on the supply side at the extensive margin. My simulation indicates that each dollar spent on the EITC leads to an extra $0.61 in earnings from new unmarried participants and to $0.22 less in earnings from a net reduction in married women's participation, for a net increase in earnings of $0.39. The NIT, by contrast, causes reductions in participation of both single and married mothers. Earnings fall by $0.62. With perfectly elastic demand, there are no spillovers to women without children under either policy.

[22] Note that the definition of labor markets is irrelevant with $\rho = -\infty$, as there are no spillover effects from taxed to untaxed workers in any case.

TABLE 3—EFFECTS OF UNIFORM 1 PERCENTAGE POINT TAX INCREASES ON LABOR SUPPLY AND WAGES, BY ELASTICITIES OF SUPPLY (σ) AND DEMAND (ρ)

	$\rho = -\infty$		$\rho = -1$		$\rho = -0.3$		$\rho = 0$	
	Change in LS (%) (1)	Change in w (%) (2)	Change in LS (%) (3)	Change in w (%) (4)	Change in LS (%) (5)	Change in w (%) (6)	Change in LS (%) (7)	Change in w (%) (8)
Panel A. Across-the-board 1pp increase in ATRs								
Relatively inelastic extensive margin ($\sigma_x = 0.5$)								
$\sigma_i = 0$	−0.50	—	−0.33	+0.33	−0.19	+0.63	—	+1.00
$\sigma_i = 0.25$	−0.50	—	−0.27	+0.27	−0.13	+0.43	—	+0.57
$\sigma_i = 0.5$	−0.50	—	−0.22	+0.22	−0.10	+0.32	—	+0.40
Central estimate of extensive margin elasticity ($\sigma_x = 0.75$)								
$\sigma_i = 0$	**−0.75**	**—**	**−0.43**	**+0.43**	**−0.21**	**+0.71**	**—**	**+1.00**
$\sigma_i = 0.25$	−0.75	—	−0.34	+0.34	−0.15	+0.50	—	+0.63
$\sigma_i = 0.5$	−0.75	—	−0.29	+0.29	−0.12	+0.39	—	+0.46
Unit elastic extensive margin ($\sigma_x = 1$)								
$\sigma_i = 0$	−1.00	—	−0.50	+0.50	−0.23	+0.77	—	+1.00
$\sigma_i = 0.25$	−1.00	—	−0.40	+0.40	−0.17	+0.56	—	+0.67
$\sigma_i = 0.5$	−1.00	—	−0.33	+0.33	−0.13	+0.43	—	+0.50
Panel B. Across-the-board 1pp increase in MTRs								
Relatively inelastic extensive margin ($\sigma_x = 0.5$)								
$\sigma_i = 0$	—	—	—	—	—	—	—	—
$\sigma_i = 0.25$	−0.38	—	−0.20	+0.20	−0.10	+0.32	—	+0.43
$\sigma_i = 0.5$	−0.75	—	−0.33	+0.33	−0.15	+0.48	—	+0.60
Central estimate of extensive margin elasticity ($\sigma_x = 0.75$)								
$\sigma_i = 0$	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
$\sigma_i = 0.25$	−0.44	—	−0.20	+0.20	−0.09	+0.29	—	+0.37
$\sigma_i = 0.5$	−0.88	—	−0.33	+0.33	−0.14	+0.45	—	+0.54
Unit elastic extensive margin ($\sigma_x = 1$)								
$\sigma_i = 0$	—	—	—	—	—	—	—	—
$\sigma_i = 0.25$	−0.50	—	−0.20	+0.20	−0.08	+0.28	—	+0.33
$\sigma_i = 0.5$	−1.00	—	−0.33	+0.33	−0.13	+0.43	—	+0.50

Notes: Table shows the effect of a 1 percentage point across-the-board increase in the ATR (panel A) or MTR (panel B). Change in labor supply combines participation and hours responses, as in equation (17). Change in wage refers to the pre-tax hourly wage. σ_x and σ_i are the elasticity of labor supply on the extensive and intensive margins, respectively. ρ is the elasticity of labor demand.

The final row of each panel shows the change in after-tax income under each of the proposed policies, combining the direct transfer with the change in earnings due to increased or reduced labor market participation.[23] The labor supply effects of the EITC add to the direct transfer to single mothers, so incomes rise by $1.16. Incomes of married-couple families rise by only $0.23, as about half of the $0.45 in tax payments is offset by reduced female earnings. Total after-tax incomes rise by $1.39. Under the NIT, the change in total after-tax incomes is only $0.38, as the majority of the money spent on the program is offset by reduced earnings.

Table 4 clearly shows the EITC to be a more cost-effective means of raising low-skilled women's incomes. This echoes the conclusions of many studies of the EITC.

[23] With large policy shifts, there would be an interaction effect as changes in labor supply behavior lead to altered credit eligibility. Because I focus on extremely small policies, and I neglect their effects on eligibility for other programs (including the actual 1992 EITC), the interactions are too small to show up in the table and the actual tax transfer equals, within rounding error, the intended transfer.

Table 4—Impacts of EITC and NIT Expansions without Incidence Effects
(*Perfectly elastic demand*)

	All women	Single women		Married women	
		With kids	No kids	With kids	No kids
	(1)	(2)	(3)	(4)	(5)
Panel A. EITC expansion					
Intended tax transfer	\$ 1.00	\$ 0.55	\$ —	\$ 0.45	\$ —
To families with earned income	\$ 1.00	\$ 0.55	\$ —	\$ 0.45	\$ —
Change in labor supply (in \$ of earnings)	\$ 0.39	\$ 0.61	\$ —	\$(0.22)	\$ —
Change in after-tax income	\$ 1.39	\$ 1.16	\$ —	\$ 0.23	\$ —
Panel B. NIT expansion					
Intended tax transfer	\$ 1.00	\$ 0.67	\$ —	\$ 0.33	\$ —
To families with earned income	\$ 0.56	\$ 0.33	\$ —	\$ 0.23	\$ —
Change in labor supply (in \$ of earnings)	\$(0.62)	\$(0.38)	\$ —	\$(0.24)	\$ —
Change in after-tax income	\$ 0.38	\$ 0.29	\$ —	\$ 0.09	\$ —

Notes: Simulations are of an EITC or NIT expansion targeted at families with children, with a total expenditure of \$1 (in the absence of labor supply or wage effects). Simulation assumes $\sigma_x = 0.75$, $\sigma_i = 0$, $\rho = -\infty$. Parentheses indicate negative numbers.

However, this result turns out to be entirely dependent on the assumption that labor demand is perfectly elastic and wages therefore are exogenous. Table 5 presents my preferred simulations, using the same supply parameters and somewhat inelastic demand ($\rho = -0.3$). Where Table 4 indicated that an EITC expansion would increase total earnings by \$0.39, operating entirely through labor supply responses, Table 5 indicates that total earnings would *fall* by \$0.27. This reflects a small net increase in labor supply (+\$0.09) and a substantial (−\$0.36) reduction coming from decreased pre-tax wages.

Columns 2–5 describe the distribution of effects across single mothers, single women without children, married mothers, and married women without children. Single mothers' labor supply rises by \$0.35, a bit more than half as much as it did in the no-wage-response model. Married mothers' supply falls by \$0.10. Recall that I model single and married women as participating in distinct labor markets. Thus, wages fall in the single women markets and rise in the markets for married women's labor. In each case, these wage impacts are shared between mothers (who are eligible for the EITC or NIT) and ineligible nonmothers. The wage impacts lead to follow-on changes in labor supply among nonmothers, partially offsetting the effects on mothers' supply. Thus, while the labor supply of single mothers rises substantially relative to that of nonmothers, the absolute increase in single women's supply is fairly small.

The final rows of panel A describe the total effects on after-tax incomes and transfers. For each dollar spent on the EITC, total after-tax incomes rise by only \$0.73. This reflects increases for single and married mothers that are slightly larger than the direct tax transfers, and substantial declines for single women without children. Sixty-four cents of the \$0.73 in increased total income represents net changes in transfers. Beyond the direct tax transfers, there are large transfers from single women to their employers and smaller transfers from employers to married women. Both are divided between women with and without children. For single women, the

Table 5—Impacts of EITC and NIT Expansions with Incidence Effects
(*Demand elasticity* = −0.3)

	All women	Single women		Married women	
		With kids	No kids	With kids	No kids
	(1)	(2)	(3)	(4)	(5)
Panel A. EITC expansion					
Intended tax transfer	$ 1.00	$ 0.55	$ —	$ 0.45	$ —
To families with earned income	$ 1.00	$ 0.55	$ —	$ 0.45	$ —
Labor market effects					
Change in labor supply (in $ of earnings)	$ 0.09	$ 0.35	$(0.20)	$(0.10)	$0.04
Change in wages (in $ of earnings)	$(0.36)	$(0.31)	$(0.23)	$ 0.14	$0.05
Change in total earnings	$(0.27)	$ 0.03	$(0.43)	$ 0.04	$0.09
Net effects					
Change in after-tax income	$ 0.73	$ 0.58	$(0.43)	$ 0.49	$0.09
Net total transfer	$ 0.64	$ 0.24	$(0.23)	$ 0.59	$0.05
Panel B. NIT expansion					
Intended tax transfer	$ 1.00	$ 0.67	$ —	$ 0.33	$ —
To families with earned income	$ 0.56	$ 0.33	$ —	$ 0.23	$ —
Labor market effects					
Change in labor supply (in $ of earnings)	$(0.16)	$(0.23)	$ 0.14	$(0.12)	$0.05
Change in wages (in $ of earnings)	$ 0.55	$ 0.18	$ 0.17	$ 0.14	$0.06
Change in total earnings	$ 0.39	$(0.06)	$ 0.30	$ 0.02	$0.12
Net effects					
Change in after-tax income	$ 1.39	$ 0.61	$ 0.30	$ 0.35	$0.12
Net total transfer	$ 1.55	$ 0.85	$ 0.17	$ 0.47	$0.06

Notes: Simulations are of an EITC or NIT expansion targeted at families with children, with a total expenditure of $1 (in the absence of labor supply or wage effects). Elasticities are $\sigma_x = 0.75$, $\sigma_i = 0$, $\rho = -0.3$. Parentheses indicate negative numbers.

transfer to employers is large enough to almost fully offset EITC payments, and welfare rises by an aggregate of less than $0.01. But this reflects a $0.24 increase in the welfare of single mothers and a $0.23 reduction in the welfare of single, childless women.

Panel B repeats the exercise for the NIT. This picture looks entirely different. As in Table 4, we see that $0.44 of every dollar spent on the NIT goes to nonworking families. The availability of the benefit to nonworkers leads to small reductions in labor supply (reducing earnings on net by $0.16) and large increases in wages (adding $0.55 to total earnings). Thus, the net effect is to increase after-tax income by $1.39, and the net transfer to workers is even larger, $1.55. Even childless women receive positive transfers and see increases in their wages and after-tax incomes.

The negative net effect of the EITC on wages in Table 5 is driven by the large increase in single women's labor supply that the EITC induces with fixed wages (as seen in Table 4). This occurs because the EITC produces negative ATRs for all low-wage single mothers. As I assume that the extensive margin is reasonably elastic, but that labor supply on the intensive margin, where many single mothers face positive tax rates, is completely inelastic, the net effect is necessarily positive. Although these supply parameters correspond with what studies of the EITC's labor supply effects have found, it is worth exploring the possibility of an intensive margin response.

Table 6—Incidence Effects with Intensive Margin Responses
(*Intensive labor supply elasticity* = 0.25)

	All women	Single women		Married women	
		With kids	No kids	With kids	No kids
	(1)	(2)	(3)	(4)	(5)
Panel A. EITC expansion					
Intended tax transfer—total	$ 1.00	$ 0.55	$ —	$ 0.45	$ —
To families with earned income	$ 1.00	$ 0.55	$ —	$ 0.45	$ —
Labor market effects					
Change in labor supply	$ 0.01	$ 0.22	$(0.14)	$(0.14)	$0.07
Change in labor force participation	$ 0.19	$ 0.36	$(0.11)	$(0.11)	$0.06
Change in hours | participation	$(0.18)	$(0.14)	$(0.03)	$(0.02)	$0.02
Change in wages	$(0.07)	$(0.17)	$(0.11)	$ 0.15	$0.06
Change in total earnings	$(0.07)	$ 0.05	$(0.25)	$ 0.01	$0.13
Net effects					
Change in after-tax income	$ 0.93	$ 0.60	$(0.25)	$ 0.46	$0.13
Net total transfer	$ 0.93	$ 0.38	$(0.11)	$ 0.60	$0.06
Panel B. NIT expansion					
Intended tax transfer—total	$ 1.00	$ 0.67	$ —	$ 0.33	$ —
To families with earned income	$ 0.56	$ 0.33	$ —	$ 0.23	$ —
Labor market effects					
Change in labor supply	$(0.14)	$(0.30)	$ 0.22	$(0.13)	$0.08
Change in labor force participation	$(0.16)	$(0.26)	$ 0.17	$(0.13)	$0.06
Change in hours | participation	$ 0.02	$(0.04)	$ 0.05	$(0.00)	$0.02
Change in wages	$ 0.53	$ 0.18	$ 0.16	$ 0.13	$0.06
Change in total earnings	$ 0.39	$(0.12)	$ 0.38	$(0.00)	$0.14
Net effects					
Change in after-tax income	$ 1.39	$ 0.55	$ 0.38	$ 0.33	$0.14
Net total transfer	$ 1.53	$ 0.85	$ 0.16	$ 0.46	$0.06

Notes: Simulations are of an EITC or NIT expansion targeted at families with children, with a total expenditure of $1 (in the absence of labor supply or wage effects). Elasticities are $\sigma_x = 0.75$, $\sigma_i = 0.25$, $\rho = -0.3$. Parentheses indicate negative numbers.

Table 6 presents the simulation in which I allow for an intensive-margin supply elasticity of 0.25. Compared with Table 5, the labor supply response to the EITC among single mothers is dampened, an increase of $0.22 as compared with $0.35, despite a wage decline that is only half as large. This reflects a participation response that is nearly identical to that in Table 5, combined with an offsetting but smaller hours response. The net effect is to leave single mothers' earnings almost unchanged. However, single, childless women's earnings fall substantially. The wage effect remains nontrivial, and this has effects on both extensive and intensive margin supply decisions. When we combine married and single women, total earnings fall by $0.07. This is driven primarily by wage responses, with approximately zero net supply effect. After-tax incomes rise by $0.93, more than in Table 5 but still less than the fiscal cost.

Intensive margin supply responses have much less of an effect on the evaluation of the NIT (panel B of Table 6). Here, ATRs and MTRs move in the same direction, and the labor market effects continue to produce a large multiplier for government spending.

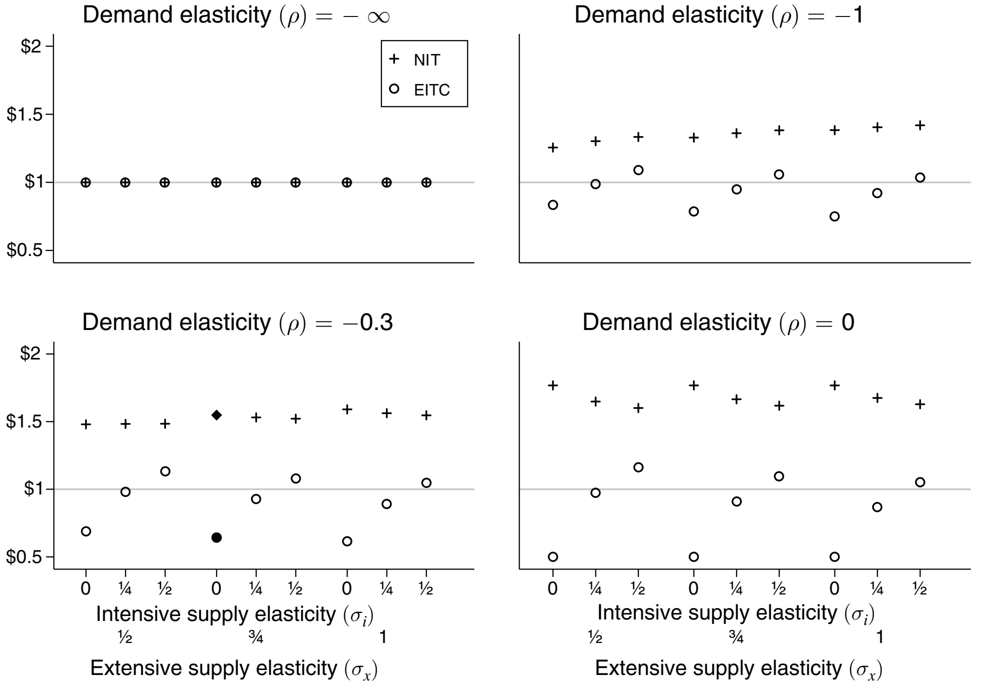

Figure 5. Net Transfers to Families under EITC and NIT Alternatives, by Demand and Supply Elasticities

Notes: Net transfers include tax credits paid by the government and transfers from/to employers due to increased equilibrium wages. Estimates are based on simulations of an expansion of the EITC or of a new NIT, each with a total cost of $1. Estimates corresponding to parameters used in Table 5 are highlighted (lower left panel). Horizontal lines indicate the statutory transfer (i.e., the tax credit portion).

A. *Alternative Parameters and Definitions*

I have also explored a variety of alternative elasticity parameters. Figure 5 reports the net total transfer to workers for each of 36 values for the (σ_e, σ_i, ρ) parameter vector. The values used in Table 5 are highlighted for reference. Each panel shows estimates corresponding to a particular demand elasticity, for all nine combinations of three extensive-margin and three intensive-margin supply elasticity parameters.

The upper left panel shows the case of perfectly elastic demand. In this case, the economic transfer necessarily equals the statutory transfer. In each of the three remaining panels, the EITC produces less than $1 in transfers to workers whenever labor supply is inelastic on the intensive margin. The shortfall is largest the less elastic is demand.[24] Figure 5 also shows corresponding simulations of the NIT. Under all 27 parameter combinations with less than perfectly elastic demand, there are large net transfers from employers to their workers, magnifying the direct effects of

[24] When the intensive-margin supply elasticity is large, total transfers are generally around $1, indicating little or no net transfer to or from employers. But this masks off-setting transfers from unmarried women to their employers and from employers to married women. See Web Appendix Figure 1.

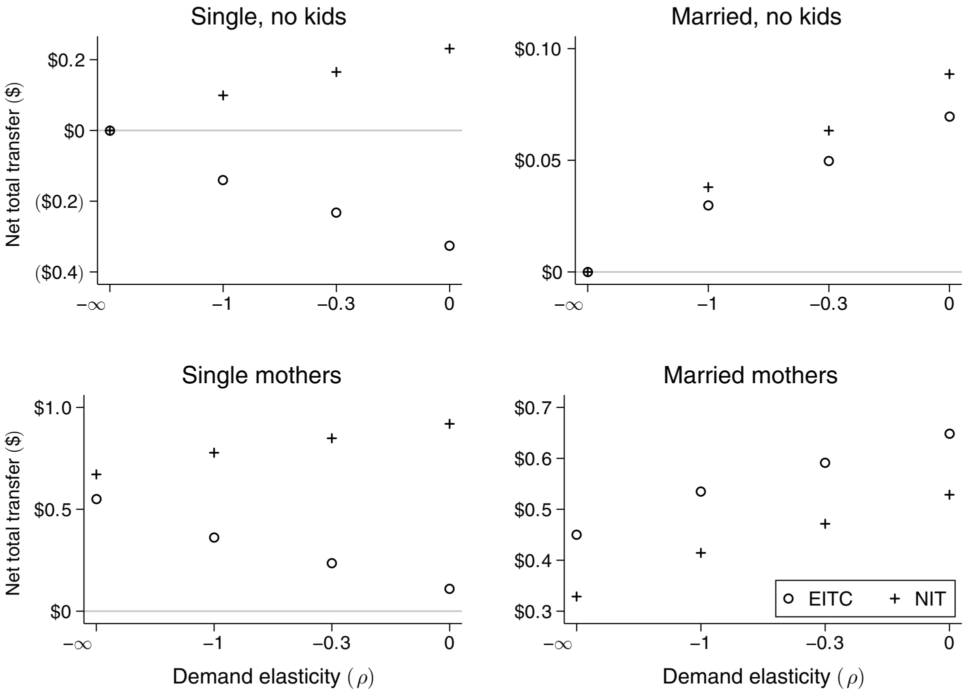

Figure 6. Net Transfers by Family Type and Demand Elasticity under EITC and NIT Alternatives

Notes: Net transfers include both tax credits paid by the government and transfers from employers due to increased equilibrium wages. Estimates are based on simulations of an expansion of the EITC or of a new NIT, each with total cost of $1. Estimates assume $\sigma_x = 0.75$ and $\sigma_i = 0$. Y-axis scale varies across panels.

the tax credits. The size of these transfers is sensitive to the demand elasticity but less so to the supply parameters.

Figure 6 shows how the distribution of transfers across subgroups (married and single, with and without children) varies with the demand elasticity. I show estimates only for my preferred supply elasticities ($\sigma_x = 0.75$ and $\sigma_i = 0$) here. The less elastic is demand, the more employers are able to capture via reduced wages to unmarried women, both with and without children, and the more they must give to married women via increased wages. In the extreme case of inelastic demand, there is approximately zero transfer to single mothers (the primary target of the EITC), a large transfer from single childless women to their employers, a transfer to married mothers that is over 50 percent larger than the direct tax transfer, and a small transfer to married childless women as well. Estimates for other parameter combinations are shown in Figures 1 (EITC) and 2 (NIT) in the Web Appendix. One result is worthy of note. Even with a large intensive-margin supply elasticity, the transfer to single mothers is notably smaller when wages are allowed to respond than when demand is assumed to be perfectly elastic.

The estimates in Figures 5 and 6 assume that there are no income effects on labor supply. Table 1 in the Web Appendix presents estimates that allow for such effects, modifying the methodology described above in ways discussed in the Appendix text. Income effects reduce total labor supply under both programs, leading to higher

Table 7—Sensitivity of Effects to Labor Market Definitions

	Net total transfer		Change in after-tax income	
	All women (1)	Single mothers (2)	All women (3)	Single mothers (4)
Panel A. EITC				
Markets segmented by marital status				
Education-experience	$ 0.64	$ 0.24	$ 0.73	$ 0.58
Geography-education	$ 0.60	$ 0.29	$ 0.68	$ 0.73
Wage (continuous)	$ 0.78	$ 0.34	$ 0.84	$ 0.59
Markets not segmented				
Education-experience	$ 0.64	$ 0.46	$ 0.73	$ 0.99
Geography-education	$ 0.57	$ 0.48	$ 0.63	$ 1.08
Wage (continuous)	$ 0.78	$ 0.50	$ 0.84	$ 0.88
Panel B. NIT				
Markets segmented by marital status				
Education-experience	$ 1.55	$ 0.85	$ 1.39	$ 0.61
Geography-education	$ 1.57	$ 0.82	$ 1.42	$ 0.56
Wage (continuous)	$ 1.52	$ 0.82	$ 1.37	$ 0.57
Markets not segmented				
Education-experience	$ 1.55	$ 0.78	$ 1.39	$ 0.49
Geography-education	$ 1.58	$ 0.76	$ 1.44	$ 0.44
Wage (continuous)	$ 1.52	$ 0.76	$ 1.37	$ 0.46

Notes: Each row corresponds to a distinct definition of the relevant labor market. Each simulation uses baseline elasticity parameters: $\sigma_x = 0.75$, $\sigma_i = 0$, $\rho = -0.3$.

wages and larger net transfers to workers. With large income elasticities, my baseline demand elasticity produces a net total transfer of $1.25 from the EITC (as compared with $0.93 with the same wage elasticities but no income effects) and $1.76 from the NIT (compare to $1.53). Thus, my omission of income effects from the main estimates does not affect the assessment of the relative attractiveness of the EITC and NIT as transfer programs.

Table 7 explores the sensitivity along a different dimension, using my baseline parameters ($\sigma_e = 0.75$, $\sigma_i = 0$, no income effects, and $\rho = -0.3$) but varying the partition of women into labor markets. I report the net total transfer and the change in after-tax income, both for all women and for single mothers. The first row of each panel repeats the estimates from the baseline simulation in Table 5. The second row considers the case in which labor markets are defined by geography (separate metropolitan and nonmetropolitan markets in each state) interacted with education (using a binary college-or-not classification). This has only small effects on the estimates, for the EITC producing better outcomes for single women and worse outcomes for married women. The third row returns to skill-based labor markets, using the continuous skill distribution discussed in Section IE. This makes the EITC look somewhat more attractive, primarily due to changes in married women's outcomes.

In my baseline model and in the first rows of Table 7, I assume that single and married women participate in distinct labor markets. This assumption is not theoretically motivated. In the second set of estimates in each panel of Table 7, I assume that married and single women compete for the same jobs. This has essentially no effect on the outcomes for all women, but dramatically improves the impact of the EITC on single mothers. Recall that the labor supply effects of the EITC are of opposite signs for married and single women. Thus, the merging of the two labor markets dampens the net change in labor supply and therefore the downward change in single women's wages. The NIT results are less sensitive to the assumption about labor market definitions, largely because the labor supply of single and married women responds in the same direction.

Taking the results of the various sensitivity analyses together, I conclude that the labor market impacts of the two proposed policies are moderately sensitive to reasonable variations in the labor supply parameters, and much less dependent on the particular labor market definition used. They are quite insensitive to the demand elasticity within plausible ranges. The general conclusion of the earlier analysis, that the superiority of the EITC over the NIT is not robust to loosening the implicit assumption of perfectly elastic labor demand, does not appear to depend on the particular modeling choices made there.

B. *Distributional Impacts*

Of course, neither the EITC nor the NIT is intended to transfer money to mothers as a class. Both are intended as income support policies for low-wage families with children. Thus, part of the evaluation of the policies must depend on their distributional effects within demographic groups. Table 8 explores the distributional impact of the two proposed programs using the baseline elasticity parameters.

In panel A, the estimates use my baseline marital status-education-age market definitions and show impacts across the four education categories. For each cell, I show the intended tax transfer under each policy and the actual transfer (including wage effects) as a share of this, separately for all women and for single mothers. The total transfer under the EITC, as seen earlier, is about two-thirds of what was intended, and single mothers receive less than half of the intended transfer. Statutory transfers under each policy are heavily tilted toward women with below-average education. Under the EITC, "leakage" through reduced wages is largest for the middle education cells, while in the highest and lowest education groups a larger share of the tax transfer sticks with the intended recipients. By contrast, under the NIT all four education groups receive a follow-on transfer from employers that magnifies the tax credit. The ratio of this follow-on transfer to the original credit is increasing in education.

In panel B, I return to the continuous skill definition, based on the hourly wage. This makes it possible to examine the effects of the two policies on each decile of the wage distribution. Both policies are targeted at the lower end of the distribution, with about 70 percent of the credits paid to working women (90 percent for working single women) going to those in the bottom half of the wage distribution. Under the EITC, less than two-thirds of the intended transfers to low-wage women stick there, while the small tax transfers to the highest deciles (mostly going to single women with low annual hours) are accompanied by relatively large wage increases. A similar pattern appears for the NIT. Though even the lowest deciles obtain larger transfers than were intended, the magnifying effect of these follow-on transfers is

Table 8—Distribution of Net Transfers with Baseline Parameters

	EITC				NIT			
	All women		Single mothers		All women		Single mothers	
	Intended (1)	Actual (as % of intended) (2)	Intended (3)	Actual (as % of intended) (4)	Intended (5)	Actual (as % of intended) (6)	Intended (7)	Actual (as % of intended) (8)
Panel A. Baseline market definitions								
Full population	$1.000	64	$0.550	43	$1.000	155	$0.671	126
By education								
Less than high school	$0.244	76	$0.090	48	$0.354	116	$0.227	108
High school	$0.431	64	$0.240	40	$0.375	157	$0.248	131
Some college	$0.260	51	$0.180	40	$0.219	181	$0.163	139
College graduate	$0.065	74	$0.041	60	$0.053	290	$0.033	159
Panel B. Continuous skill distribution								
Full population	$1.000	78	$0.550	62	$1.000	152	$0.671	122
By education								
Less than high school	$0.244	80	$0.090	64	$0.354	113	$0.227	106
High school	$0.431	78	$0.240	61	$0.375	150	$0.248	123
Some college	$0.260	75	$0.180	62	$0.219	170	$0.163	131
College graduate	$0.065	80	$0.041	60	$0.053	357	$0.033	168
By hourly wage decile								
Nonworkers	$0.207	100	$ —	—	$0.549	100	$0.344	100
1st decile (bottom)	$0.171	67	$0.091	58	$0.136	122	$0.095	110
2nd decile	$0.167	63	$0.110	60	$0.098	144	$0.070	118
3rd decile	$0.151	64	$0.110	60	$0.074	168	$0.054	129
4th decile	$0.138	61	$0.112	62	$0.059	215	$0.046	149
5th decile	$0.074	68	$0.063	65	$0.033	257	$0.028	166
6th decile	$0.045	86	$0.034	68	$0.023	364	$0.017	194
7th decile	$0.016	151	$0.011	58	$0.009	786	$0.006	368
8th decile	$0.013	186	$0.009	76	$0.007	847	$0.005	377
9th decile	$0.009	219	$0.005	78	$0.006	990	$0.004	411
10th decile (top)	$0.009	195	$0.005	77	$0.006	894	$0.004	359

Note: Simulations use baseline elasticity parameters: $\sigma_x = 0.75$, $\sigma_i = 0$, $\rho = -0.3$.

much larger in the higher wage categories. Under each policy, the upper decile wage effects are concentrated among married women. Even relatively high-wage married women may face positive ATRs (see Figure 4), and the resulting reduction in their labor supply leads to wage increases in this submarket.

VII. Discussion

Analyses of tax and transfer policy, both theoretical and empirical, have tended to ignore the potential effects of these policies on wage rates. The implicit assumption has been that the entire economic incidence of taxes is on workers. Although some empirical analyses (e.g., Gruber 1997, Anderson and Meyer 2000) find evidence in support of this, others (Anderson and Meyer 1997; Kubik 2004; Leigh forthcoming) suggest that employers are likely to bear a portion of the tax burden as well.

The neglect of incidence considerations is defensible in some contexts. But when tax policy is used explicitly as a tool to manage labor supply incentives, as with the EITC, the issue can no longer be ignored. This paper has shown that under reasonable demand elasticities substantial portions of the funds expended on the EITC are shifted to employers, with negative consequences both for EITC recipients and for ineligible workers in the same labor markets. Although the exact magnitudes of these effects are sensitive to the details of the simulation, their qualitative importance is quite robust.

Many discussions of tax policy have concluded that the EITC resembles the optimal tax schedule or that it is a cost-effective mechanism for raising the incomes of low-skill workers with children. All of these are based on fixed-wage analyses in which the results generally turn on the substantial positive effects of the the EITC on labor supply. Allowing wages to adjust substantially weakens the case for the EITC. With reasonable parameter values the net effect of the program on the earnings of single mothers is negligible, as declines in wages offset increases in hours. Feasible alternative policies, including the NIT, are much more effective.

There are several limitations to the analysis undertaken here. In addition to those mentioned earlier, three are worth highlighting as potential directions for future work. First, I have assumed that labor supply elasticities are constant across female workers of different types. It would be straightforward to extend the formulas in Section I to allow for heterogeneity in labor supply behavior. Eissa and Hoynes (2004) estimate a wage elasticity of participation for married women that is much smaller than those typically obtained for single women. With uniform elasticities, the EITC's negative effect on married women's labor supply partially offsets its positive effect on that of single mothers. If married women are less responsive than are single women, this offsetting effect is overstated, and the EITC's net wage effects are even more negative than those presented above.

Second, I have ignored the interaction between my proposed EITC and NIT policies and other preexisting distortions to the low-skill labor market. These would affect the welfare results. By treating my proposed policies as the only taxes, I have been able to ignore deadweight losses as second-order, where the EITC might yield first-order reductions in deadweight loss produced by other work-discouraging programs. Interactions between the EITC and other programs might also have first-order effects on the government budget. But my results on after-tax incomes would not be affected by the inclusion of other programs in the simulation.

Finally, it would be interesting to examine the impact of incidence effects on the design of optimal transfers. The results here indicate that labor-supply-promoting schedules are less desirable than one might otherwise expect. A plausible consequence is that the optimal tax should have higher (less negative) tax rates at low incomes. This would be a fruitful topic for future research.

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