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**The Effects of the Earned Income Tax Credit on the Occupational
Group Wages of Low Income Workers**

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Group Wages of Low Income Workers**

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Professional Report

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Dedication

For my parents, Colonel Clarence Meade and Mrs. Sharyn Meade. Thank you for teaching me to question the status quo, to fight for what I believe in, and to work diligently with passion. You are shining examples of selfless service.

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I would like to thank my wonderful readers Dr. Chandler Stolp and Dr. Christopher King for their unfailing support and guidance throughout the research and writing process. This report could not have been completed without the positivity and belief they emitted. I am also grateful for the assistance of Brian Levy in collecting the data necessary to perform my analysis. His efforts saved me hours of painstaking data digging. Aside from the technical supported he offered, Brian spent countless hours listening to my ideas and encouraging me; for that I am wholly appreciative. I also want to express my gratitude to Dr. James Ziliak for taking a chance on me so many years ago when he selected me to work for him as a research assistant. That opportunity allowed me to discover my passion for social and economic policy, particularly as it relates to low-income families. Without his guidance, I would not be the budding policy wonk that I am today. Finally, to my family, thank you. I could not have done this without your guidance, patience, and financial support.

May 3, 2010

Abstract

The Effects of the Earned Income Tax Credit on the Occupational Group Wages of Low Income Workers

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The University of Texas at Austin, 2010

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Annually, over 25 million people in the United States receive the federal Earned Income Tax Credit (EITC). Nearly 5 million of those people are lifted out of poverty by the wage supplement the credit provides. A wide body of literature supplies evidence for the positive labor force participation effects of the EITC. However, little is known about the effects of the additional labor supply on the wages of low-income workers. This report employs state-level panel data to estimate the influence of EITC visibility and benefit levels on the wages of occupation groups with high shares of EITC eligible workers. Using OLS regression, I find that a 10 percent increase in the share of the population claiming the EITC corresponds with a 0.3 to 2.2 percent decrease in the median wages of high-EITC eligible sectors, relative to overall median wages. Further, a 10 percent increase in the maximum benefit level of the EITC corresponds with a 0.1 to

0.8 percent decrease in median wages in occupation groups with large shares of EITC eligible workers, relative to overall median wages. These findings provide useful information to policymakers regarding the unintended consequences of the EITC. Policy recommendations include increasing the credit value for childless adults, regularly adjusting the minimum wage for inflation, and financially penalizing employers who engage in unsavory wage behavior.

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Chapter 1: Introduction

WORKING AND POOR: THE CASE FOR CONCERN

Millions of Americans work in the labor force each year, and yet, many remain in poverty despite their efforts at self-sufficiency. Indeed, in 2009 there were over 8.1 million families in poverty, and over two-thirds of those families include at least one worker. Low-wage workers are defined as those workers ages 25 to 64 whose hourly wage rate, if they work full-time for a year, would place their annual earnings at or below the poverty line for a family of four. Using this very conservative definition, approximately one-third of all workers in the United States are in low-wage jobs.

Poverty and economic inequality in the United States are at record highs, posing a great peril to our society. Evidence suggests that poverty and inequality carry high social costs that primarily lead to negative social consequences (Jencks 2002). Yet, debate lingers about the role of public involvement in alleviating income disparities across individuals. Perhaps this occurs because to say that inequality is a public concern is to concede a belief in luck; the kind of luck about which John Rawls philosophizes, that leads to undeserved inequality and is independent of one's life choices.

Some view inequality as a natural consequence of America's free-enterprise system; stemming from a free-market structure that provides incentives for individual risk taking and entrepreneurship. The benefits of economic growth may be unequal, but almost everyone benefits. Inequality, argue some, results from variation in individual choices made along the path to satisfying preferences. Inequality, it seems, is natural.

The extent to which disparity naturally arises comes under scrutiny when, in reality, we see systematic differences between and within groups. Low-wage workers are disproportionately female, minority, young, without a college education, and are more

likely to live in households with children that are headed by single females (Schochet and Rangarajan 2004). Further, while they work in all occupations and industries, low-wage workers are disproportionately represented in the retail trade industry, low-end service and sales occupations, and non-union jobs (Schochet and Rangarajan 2004). With such disparate patterns of revealed opportunities, it is hard to deny that our society favors certain life starting points over others; and that those with better “natural endowments” often succeed independent of merit. These deep-seated inequalities tremendously affect the life course by no fault of one’s own. The role of the government then, is to ensure equality of opportunity for all individuals.

Somewhere between effectively abandoning capitalism’s incentives and doing nothing lay the answers to addressing poverty and inequality. The American public voices a vested interest in providing equality of opportunity and a minimum standard of living for disadvantaged individuals and families. Several programs in the U.S. social program portfolio aim to assist low-income working families; but, chief among them is the Earned Income Tax Credit (EITC). The program is unique among anti-poverty programs in the social safety-net both in that it is targeted exclusively to individuals with labor market earnings and that it is one of only a few refundable credits in the extensive U.S. tax code. Perhaps the highlight of the EITC’s uniqueness is that, unlike other interventions (e.g. minimum wage), it does not seek to directly interfere with labor market processes, thereby avoiding increases in the price of labor and reduced employment opportunities. Rather, by supplementing the earnings of working individuals, it alleviates the cumulative effects of natural endowments that determine one’s life path and thereby offers the promise of reducing economic inequality.

The core design of the EITC is such that both liberals and conservatives support its existence. Conservatives, who are often hesitant to support cash assistance, find the

labor market earnings requirement appealing, while liberals view the program as a great source of cash assistance for the working poor. Indeed, the EITC is sometimes referred to as a program that employs an unusual alliance of conservative values and liberal funding (Hoffman and Seidman 2003).

THE EARNED INCOME TAX CREDIT: AN OVERVIEW

History

Established in 1975, the federal Earned Income Tax Credit (EITC) is today recognized as the most effective anti-poverty program for working low-income families in the United States (Kneebone 2010). The EITC is a federal tax credit targeted toward low- and moderate-income working people that is designed to encourage work and offset payroll taxes. It is a refundable credit; thus, any amount in excess of a low-wage worker's income tax liability is returned and therefore acts as a modest supplement to wages. Some regard the program as a variation of Milton Friedman's Negative Income Tax proposal (Friedman 1962), but its distinguishing factor lies in the earned income requirement which limits its scope to the working poor. In 2009, the EITC lifted an estimated 6.6 million people above the poverty line, including 3.3 million children (Center on Budget and Policy Priorities 2009).

Over the last 35 years, several large expansions transformed the EITC into a \$50 billion program, serving over 25 million people annually.¹ The 1993 Budget Reconciliation Act substantially expanded the EITC program as a response to President Bill Clinton's promise to "make work pay." Between 1994 and 1996, incremental changes to benefit rates and eligibility requirements created the successful program we

¹ According to the Internal Revenue Service EITC Website (<http://www.eitc.irs.gov/central/abouteitc/>), 25 million people receive about \$50 billion in EITC benefits.

know today. The EITC became the hallmark of the trend in the United States to enhance incentives to work with means-tested assistance and targeting aid to the so-called deserving poor. A recent study found that half of all families with children receive the EITC at some point (Center on Budget and Policy Priorities 2009).

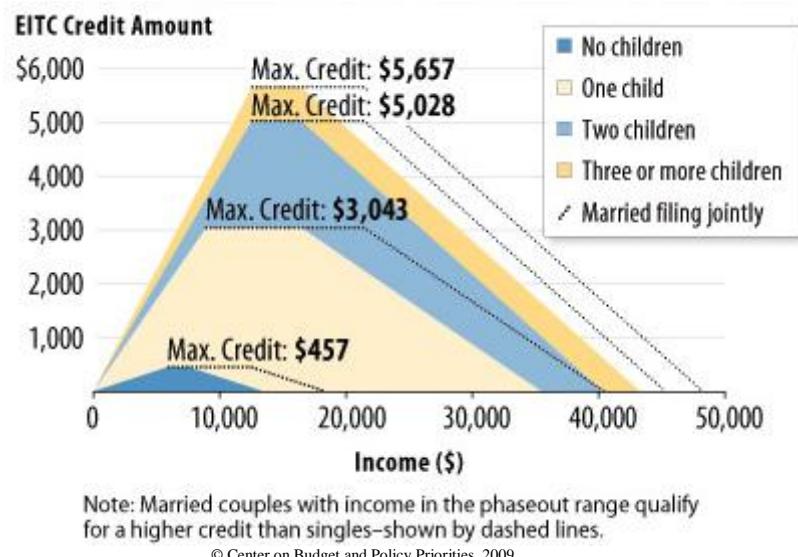
The substantial EITC expansions of the early and mid-1990s occurred in the midst of major reforms to cash welfare and other social safety-net programs; most of which were attempting to increase the labor force participation of single mothers. In the 1980s, the program was estimated have to reduced poverty rates by 0.2 to 0.4 percentage points. The post-expansion estimates of the EITC's effect on poverty rates suggest decreases of 1.5 percentage points (Hoffman and Seidman 2003). Participation is estimated to be at 75 to 85 percent of the qualifying population (Internal Revenue Service 2009). Administrative costs of the program are low, running at a ratio to claims paid of less than one percent (Internal Revenue Service, 2009). Relative to traditional cash assistance (e.g. Temporary Assistance for Needy Families (TANF)), the EITC has a larger budget and reaches substantially more people. Particularly in the years following welfare reform, the EITC grew to overtake traditional income subsidy programs as the largest cash transfer program for low-income families (Hoynes 2008).

In addition to the federal EITC, states may create their own EITC, which is usually defined as a flat percentage of the federal benefit. Over the past decade, 24 states and the District of Columbia have reformed their tax codes to include a state EITC to offset state income tax liability, provide an additional financial boost to low-income working families, and lift families out of poverty while also offering even greater incentives to work.

Program Structure

The value of the EITC is calculated based on the amount of labor-market earnings and adjusted gross income, as well as the number of qualifying children and marital status. Working-poor families with children and incomes slightly below the federal poverty line receive the largest benefit. The four parameters that define the credit are the phase-in rate, the maximum credit, the income level at which the credit begins to phase out, and the marginal tax rate for a family with a specified earned income which depends on the range in which the income level falls. The credit is divided into three ranges: the so-called phase-in range where the value of the EITC increases as earnings rise, the plateau range where the maximum credit is obtained, and the phase-out range where the size of the credit diminishes with increases in earnings. Figure 1 provides an illustration of the EITC structure.

Figure 1: The Federal Earned Income Tax Credit in Tax Year 2009



For example, in 2009, every dollar earned by an individual with at least two qualifying children initially receives a credit of 40 cents on the dollar until earnings reach

\$12,570. At this point, the maximum credit of \$5,028 is obtained, and it remains at that level until earnings reach \$16,420. The credit is then reduced by 21.06 cents for every dollar of earnings above \$16,420 until it falls to zero, when earnings reach \$40,295.² If the dollar value of the credit reduces the family's tax liability below zero, then the excess amount is refunded to the taxpayer. For instance, a family with a tax liability of \$100 and an EITC of \$700 would receive a refund of \$600. In the 2007 tax year, the average EITC refund amounted to just over \$2,488 for a family with children and \$243 for a family without qualifying children³ (Center on Budget and Policy Priorities 2009).

Relative to other policies that aim to increase the financial stability of low-income families, the EITC is thought to have the best “target efficiency” and labor market impacts (Hoffman and Seidman 2003). Target efficiency refers to the proportion of the benefits distributed that reach the intended recipients. In the case of the EITC, the working poor population is the intended target for the income subsidy. The structure of the program is such that the largest benefits go to those individuals, with qualifying children, who work full-time at the minimum wage level. Not only is the EITC programmatically different from traditional cash assistance, it produces stronger positive work incentives by providing larger credits as individuals approach full-time employment.

Several empirical studies confirm that the benefits of the EITC are more concentrated on the poor and near-poor than the benefits of minimum wage policy. Burkhauser, Couch, and Glenn (1996) compare the distributional effects of an increase in the minimum wage with those of an increase in the EITC. They find that 42 percent of

² Figures cited are from EITC Parameters 1975-2009, at the Tax Policy Center. Accessed Feb. 20, 2010.

³ The IRS defines a qualifying child as a child (blood, foster, or adopted) under the age of 19 (24 if a full-time student, any age if permanently disabled) who lives with the tax filer, in the United States, for more than half of the year.

EITC benefits went to families with an income-to-needs ratio of less than 1.25 while only 21 percent of minimum wage benefits went to the same group. The majority of the minimum wage benefits went to families with income-to-needs ratios greater than two. Ultimately, following the completion of EITC expansions in 1996, over 70 percent of the increases were estimated to reach the working poor or near-poor; this stands in stark contrast to the \$.75 increase in the minimum wage that was predicted to benefit 26 percent of the same population (Burkhauser, Couch, and Glenn 1996). Clearly, the weakening link between low wages and household income calls for a more effective means of reaching the working poor. Because the EITC benefit level is based on household income, it has better target efficiency than the minimum wage, which provides benefits on the basis of individual earnings. Additionally, the EITC produces fewer of the negative employment effects that accompany many income based benefit programs.

Trends in Benefit Levels

Between 1993 and 1996, maximum real EITC benefit for one-child families grew by 38 percent, while families with two or more children saw a real increase of 117 percent (Rothstein, 2008). Before 1994, the EITC was not available to workers without dependent children. Today, the benefits for workers with dependent children are substantially larger than those of childless workers. And, for the 2009 tax year, the Internal Revenue Service (IRS) introduced a new expanded benefit category for families with three or more children. This addition will undoubtedly continue the EITC's success in lifting more children out of poverty than any other single program or category of programs. However, the increasing disparity in EITC benefit amounts between taxpayers with and without qualifying children exacerbates inequality between the two groups and generates concern among those interested in the economic security of the working poor.

LABOR MARKET IMPACTS

An employee's EITC eligibility status is often invisible to employers. To ascertain workers' benefit statuses, employers need to know employees' number of children, estimated annual earnings from all jobs, and the estimated annual earnings of employees' spouses. Such information is not obvious or available to employers and, as such, one expects the tax-incidence of the EITC to differ from that of payroll taxes or similar employer based taxes based solely on income level. Clearly, the effects differ because the EITC is a subsidy rather than a tax; however, recent evidence suggests that firms alter behavior regarding wage rates in response the mean EITC eligibility in a labor market sector. Specifically, sectors that traditionally employ low-educated, female workers witnessed decreases in hourly wages in the years following large EITC generosity expansions as the labor supply of such workers increased (Azmat 2006, Rothstein 2008, Leigh 2009).

This report aims to measure the effects of the EITC on median wages. Diverting from the individual as the unit of analysis, as is used in previous studies, this report uses state level data to analyze the effects of the EITC on the wages of labor market sectors that have high levels of EITC-eligible workers. Ultimately, this approach provides insight to the broader effects of the policy on the wages of entire sectors within and across states rather than only on the individual level. Using OLS regression, I find that a 10 percent increase in the share of tax filers in a state that claim the EITC reduces the median wages in high EITC-eligible occupations by 0.2 to 2.2 percent, relative to the overall median wage. Further, every 10 percent increase in the EITC maximum benefit level generates median wage growth declines of 0.1 to 0.8 percent in occupations with high shares of EITC employees.

The results of this analysis provide useful information to policymakers at the local, federal, and state levels regarding future changes to the structure, generosity, and eligibility standards of the EITC. The effects of increases in EITC take-up rates and benefit levels influence the wage rate of entire labor market sectors. Those individuals with qualifying children are virtually unharmed by the slowing wage growth because the size of the EITC benefit greatly outweighs the wage decrease. However, individuals without qualifying children receive little to no EITC benefit and experience declining wage growth. This phenomenon essentially works to increase economic inequality between workers with and without qualifying children. To reverse this trend, policymakers must consider expansion of EITC eligibility and maximum benefit levels for individuals without qualifying children.

Chapter 2: The EITC and the Labor Market

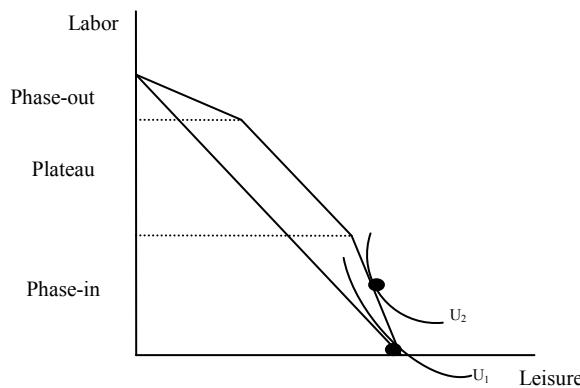
The economic argument for explaining the negative effects of the EITC on wages depends on standard labor market and tax incidence assumptions rather than on the idea that employers may be aware of an employee's potential EITC eligibility, and, as such, offer him/her lower wages. In order to adequately explain the reasoning, I begin with a basic explanation of individuals' labor supply decisions. Economic theory tells us that individuals' labor supply decisions are driven by many factors, chief among them are compensation and nonlabor income, and that the decisions are made along two dimensions—to work or not and how many hours to work. Leisure and consumption preferences among individuals determine the extent which they participate in the labor market. The cost of an hour of leisure is said to equal the hourly wage rate. The optimal level of labor supplied occurs where levels of consumption and leisure make an individual equally satisfied.

The EITC enters the scenario by altering the level of nonlabor income and possibly the wage rate. As such, it increases income and the price of leisure. The income effect predicts that the additional nonlabor income provided by the credit will reduce the amount of labor supplied. If the EITC induces an increase in the wage rate that does not make an individual better off at the current level of labor supplied, the substitution effect predicts that hours of work will increase. If large enough, both the income and substitution effects could produce an incentive for individuals to enter the labor market. Changes in the wage rate produce substitution and income effects that have conflicting effects on labor supply.

Figure 2 illustrates the initial budget constraint of an individual who is not in the labor force or works very few hours. The EITC creates a budget constraint with kink-

points at each of the earnings levels where the credit size determination changes. For the individual characterized in Figure 2, the introduction of the EITC provides incentives for him/her to increase participation in the labor force and/or increase the number of hours worked. This movement is reflected by the outward shift of the individual's utility maximization from U_1 to U_2 .

Figure 2: The EITC and the Labor Supply Decision

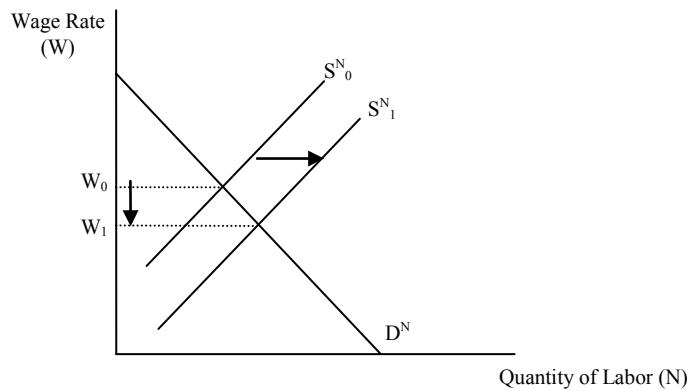


The introduction of a tax or transfer program affects the labor market behavior of individuals through the substitution and income effects and, as such, can create a new equilibrium wage and level of employment. The net marginal wage is the unit upon which labor supply analyses are based. If the market wage is equal to w and the tax rate is represented by t , then net marginal wage is $w_m=w(1-t)$ for a tax and $w_m=w(1+s)$ for a subsidy where s is the subsidy rate. Earnings subsidies, such as the EITC, increase the incentives for individuals to enter the labor market and/or increase the number of hours they work. The influx of additional workers increases the labor force participation rate, while the growth in hours worked increases labor supply. Changes in hours worked are said to occur on the intensive labor supply margin, while labor force participation decisions occur on the extensive margin of labor supply. Following growth on either

margin, if the demand for labor remains unchanged, the market clears at a lower wage rate and a higher level of employment.

Figure 3 displays the effect on wages of an increase in the supply of labor combined with an unchanged demand for labor. Movement of the supply curve out to S^N_1 represents the effect of increased labor force participation. This shift results in a decline in wages from W_0 to W_1 .

Figure 3: Effect of an Increase in Labor Supply on Wages with Unchanged Demand



In the standard labor market framework, taxes and subsidies are distributed between employers and their workers; which ultimately affects the wage rate. Assume a labor market where employees earn a wage w and are subject to a tax/transfer schedule that implies a tax t . In the case of a subsidy, such as the EITC, t is negative. Suppose that the labor market is characterized by labor demand L^d and labor supply as a function of the wage rate, $L^s(w)$. Payroll taxes increase costs for producers who may pass on the burden to employees in the form of lower wages. Subsidies, however, indirectly lower production costs for employers because another entity is subsidizing a portion of labor costs. When workers pay taxes on labor, equilibrium occurs when $L^d(W)=L^s(w)$, where

$w=(1-t)W$, with W equaling the gross wage level.⁴ In the case of a tax, workers face lower net wages but higher gross wages. Subsidies, however, increase net wages for recipients but lower gross wages for the entire market. Because gross wages are lower for the entire labor market, yet only some receive the subsidy, a system of winners and losers arises.

The extent to which employers and employees share the distribution of a tax or subsidy depends on the elasticities of labor supply and labor demand. The more inelastic group receives the larger share of the benefit. In labor submarkets with low demand elasticity, targeted earnings subsidies can unintentionally lead to transfers from employees to employers. When labor supply is elastic and labor demand is inelastic, a portion of the subsidy is transferred to the employer which can take on the form of lower wages for employees. Studies of aggregate employment wage elasticity as well as the minimum wage find that the elasticity of labor demand is relatively inelastic and ranges from -0.1 to -0.3 (Brown, Gilroy, and Kohen 1982 and Hamermesh 1987). Wage changes are inversely proportional to the elasticity of labor demand. Given what we know about the elasticity of labor demand, a policy that increases labor supply by one percent should reduce wages by anywhere from 3.3 to 10 percent.

In evaluating the effects of the EITC on wages, it is also necessary to look at the sharply differing incentives offered at each level of the credit. The budget constraint of the EITC subsidizes work at an increasing rate during the phase-in region, while subsidizing earnings at a decreasing rate as the credit phases out. The substitution and income effects at the various phases of the credit offer insight as to how it affects labor supply and wages. Unlike a positive income tax, the structure of the EITC is such that the

⁴ Explanation adapted from the partial equilibrium incidence model presented in Eissa and Nichols (2005).

resulting substitution and income effects may work in opposing directions depending on the marginal tax rates (MTR) of each phase. The MTR is responsible for causing the substitution effects while virtual income at each phase induces the income effects. Because the EITC is a refundable credit that results in a net transfer from the government to individuals, the income effect is likely to be pertinent. Economic theory suggests the following effects in each region of the EITC:

- Phase-in Region: The substitution and income effects move in opposite directions. Labor supply increases and wages decrease due to the substitution effect. But, the income effect decreases the labor supply while increasing wages. The net effect in the phase-in region is ambiguous, theoretically speaking.
- Plateau Range: The substitution effect equals zero and the income effect reduces labor supply and increases wages; thus, the net effect is an increase in wages.
- Phase-out Region: The substitution and income effects move in the same direction. Together, they reduce labor supply and increases wages. The net effect is an increase in wages.

To predict the overall labor market effects of the EITC, we need to know which region of the EITC drives the changes in labor supply. Supply changes are induced at both the extensive and intensive margins; we need to know which experiences the larger surge. Increases in labor supply on the extensive margin imply that new workers enter the labor market, while growth on the intensive margin implies that the same workers are supplying an increased amount of labor (more hours). If most of the growth is occurring on the extensive margin, we can conclude that the phase-in region dominates the labor supply effects.

Empirical studies of the impacts of the EITC on labor supply find that the effects are largest at the extensive margins; that is, increases in the generosity of the EITC

increase labor force participation. This shift in labor supply is not accompanied by a large increase in labor demand; thus, the corresponding effect is a decrease in the equilibrium wage rate with employers capturing a portion of the intended transfer. The literature suggests a surprising lack of growth on the intensive margins from increased EITC generosity (Eissa and Liebman 1996; Meyer and Rosenbaum 2001; Eissa and Hoynes 2006). Researchers speculate about why this is the case and suggest that because employers are largely in control of the number of hours they offer, their preferences on hours of work demanded keep workers from freely varying their hours. Further, the minimal growth on the intensive margin is partially attributable to imperfect perception of marginal tax rates by employees (Meyer and Holtz-Eakin 2002; Eissa and Liebman 1996).

EMPIRICAL EVIDENCE OF LABOR MARKET EFFECTS

Following the expansions of EITC generosity in the early to mid-1990s, a number of studies were conducted to determine the empirical effects of the policy on labor supply and income. Up until that point, the relatively small program had minimal impacts on the overall labor market for low-wage, low-skill labor. The EITC's expanded size and scope induced variation in individual budget constraints, affecting labor-leisure decisions, which in turn altered wage rates (pre- and post-tax) and net income. In the last decade, several researchers began to disentangle the effects of the credit on the wages of low-income workers. This section outlines the major findings and evidence in these three areas: labor force participation, income, and wages/inequality.

Labor Force Participation

The literature on the impacts of the increased generosity of the EITC suggests that the policy unambiguously increased the labor force participation of single mothers

(Meyer and Holtz-Eakin 2002). Further, the credit results in statistically significant increases in aggregate labor force participation; however, the effects among single women with children are much larger. The policy has often received praise as a welfare-to-work program because of its tremendous labor supply effects among women who might otherwise choose welfare over work. Empirical evidence on the labor supply effects of the EITC shows that labor force participation increases are more substantial than the hours of work effects (Hoffman and Seidman 2003). That is, the EITC has a greater role in inducing individuals to enter the labor force than it does in increasing hours worked by individuals who are already in the labor force. Further, among groups that face negative work incentives, the EITC decreases labor force participation. The remainder of this section explains these findings in greater detail.

Eissa and Liebman (1996) focused on the labor market participation and hours of work of single women with children. By comparing the change in the labor supply of single women with children to that of single childless women, they identified the change in labor force participation. Their study concludes that labor supply increased 2.8 percent due to the change in the generosity of the EITC. Meyer and Rosenbaum (2001) used a simple structural model to examine the effect of the EITC on the employment of single mothers. They find that the seven percent increase in single mothers' employment in 1996 was due to the EITC. A later study by Meyer (2002) shows that between 1990 and 1997, the period of the greatest EITC expansion, the employment of single mothers without a high school degree rose 22 percent. In fact, the largest changes in the employment of single mothers with children between 1984 and 2005 were seen among those with less than a high school education (Meyer 2007). Among single women, employment of those with two or more children varied little prior to 1994, at which point their employment increased relative to those with only one child (Meyer 2007).

Using earlier research on the elasticity of labor demand, the findings on the labor supply effects of the EITC suggest corresponding wage decreases of anywhere from 9.3 to 28 percent.⁵ However, we do not see these drastic decreases, which is partially due to wage floor policies such as the minimum wage. The more influential reasons are the number of other policy changes that influenced labor supply (e.g. PRWORA of 1996, Medicaid and childcare expansions) and the booming economy during the relevant time frames of the studies. Even so Meyer and Rosenbaum (2001) cite the EITC as the most important change for single mothers in the financial incentive to work.

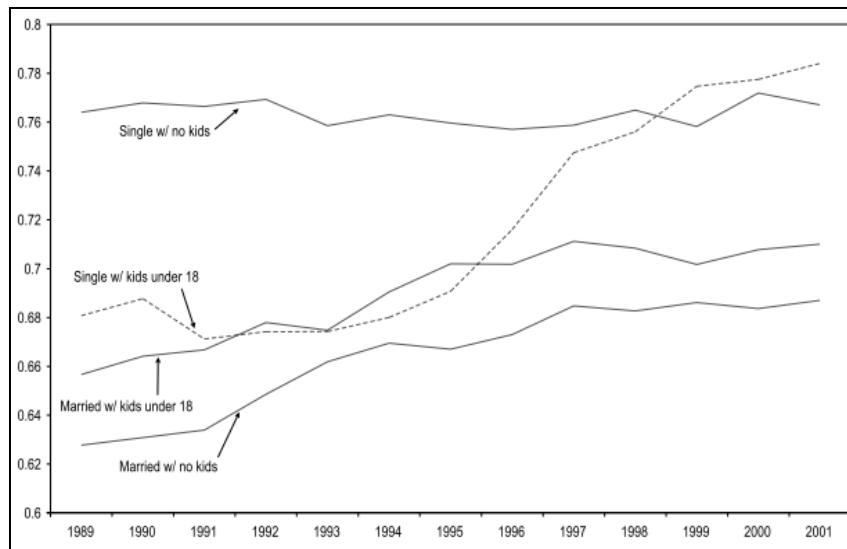
Theoretically, the EITC carries a marriage penalty that would reduce labor supply incentives among married people in the flat and phase-out portions of the credit. Several studies on the marriage effects found that they are negative overall but particularly dependent upon incentives (Eissa and Hoynes 1998; Ellwood 2000). Using a natural experiment comparing married men and women with children to married men and women without children, Eissa and Hoynes (1998) find a 1.8-4.3 percent decrease in the labor force participation of married women with children. However, they also find that the participation of married women with children in the labor force increased by 9 percent in the phase-in range and decreased by 5-6 percent in the plateau and phase-out regions of the EITC's benefit schedule. Eissa and Hoynes (1998) also observed very small effects of the 1993 EITC expansion on the labor force participation of married men with children.

In another attempt to decipher the marriage effects of the EITC, Ellwood (2000) conducted a natural experiment using the number of children and husband's income. The

⁵ Brown, Gilroy, and Kohen (1982) and Hamermesh (1987) find that elasticity of labor demand ranges between -0.1 to -0.3 while Eissa find that labor supply increased 2.8 percent because of the EITC. The corresponding estimated wage decrease is equal to the inverse proportion of the two figures; thus $2.8/-0.3 = -9.3\%$ and $2.8/-0.1 = -28\%$.

results show that 1993 expansion of EITC and the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA), which reformed cash assistance, decreased the labor force participation of low-wage married mothers by 3-7 percent compared to higher wage married mothers. Ellwood (2000) also finds that the labor force participation rate of low-wage married mothers in the phase-in region of the credit increased by 13 percent if they had family incomes low enough to produce positive work incentives. Using data from the March Supplement of the Current Population Survey, Figure 4 displays the trends in the women's labor force participation by marital status and the presence of children during the 1990s.⁶ Of particular note is the drastic increase in the labor force participation of single women with children under 18, represented by the dashed line.

Figure 4: Labor Force Participation of Women by Marital Status and Presence of Children, 1989-2001



⁶ This table was borrowed from page 15 of Christopher King's 2003 article, "Promises, Promises: Welfare Reform and Work in Urban America," in the *LBJ Journal of Public Affairs*,

Empirical evidence for the labor force participation of childless workers is less conclusive than that for single and married mothers. As mentioned earlier, most studies conclude that changes in the level of employment were largest among adults with children. Meyer and Rosenbaum (2001) find that between 1990 and 1996, the rate of employment among single mothers with children grew 6 to 7 points more than that of single childless women. Because EITC benefit levels are substantially lower for childless workers, their labor force participation incentives are reduced. One should not be surprised by the lack of conclusive evidence for childless workers; researchers only minimally studied the effects of the EITC prior to its generous expansion, and they less often examine the effects for the group that receives almost nominal benefits. Still, empirical evidence shows that among all EITC recipients, hours of work increase in the phase-in region of the credit and decrease in the plateau and phase-out regions (Hoffman and Seidman 1990; Dickert, Houser, and Scholz 1995).

Income

The EITC increases net the incomes of poor individuals and families in two ways. Not only does it incentivize work but it also offsets tax burdens, specifically payroll and excise taxes, which are naturally regressive and disproportionately affect low-income workers. Due to the earned income requirement and the high level of income up to which families receive the credit, it is clear that the program is not exclusively targeted at families in poverty. Hoffman and Seidman (2003) assert that the EITC is a program for low-to-moderate income families rather than poor ones and estimate that only 35 percent of poor families receive cash assistance from the program. Still, the credit lifts over five million Americans above the poverty line annually and reduces the hardship of many more that remain impoverished (Internal Revenue Service 2009; Ziliak, 2003). Hoffman

and Seidman (2003) estimate that the EITC reduced the 1999 poverty rate by 1.5 percentage points, an amount that they say is neither “trivial” nor “enormous” (51). Yet, they concede that the program had a substantial impact among the poor families who did qualify for and receive the benefits, 25 percent of whom were lifted above the poverty line by the credit. Hoynes, Page, and Stevens (2006) find that when EITC income is included in the calculation of poverty, the rate lowers by 1.7 percentage points among the whole population and drops by 3.1 percentage points among children.

Of poor families who are ineligible for the credit, Hoffman and Seidman (2003) estimate that one-third are demographically ineligible⁷, another third have no earned income, and the remaining third have incomes that are above the maximum level for credit receipt. The group with earnings that are too high primarily contains childless families; for these people, the EITC maximum qualifying earnings level is less than the poverty threshold for a two-person family.⁸ By the nature of its eligibility criteria, the EITC is not intended to be a transfer program for those in extreme poverty. Further, the structure of the credit ensures that the largest benefits go to near-poor families, those just above or below the poverty line. Still, there is a fundamental program flaw regarding childless families who do not qualify for the credit at income levels below the poverty threshold.

It is possible that the gross incomes of childless workers fall following an increase in EITC generosity. Since their labor supply remains unchanged, they do not receive as large of an additional benefit as workers with children, and the hourly wages within their occupation groups may decrease.

⁷ Do not have qualifying children and/or are not within the EITC eligible age range (between the ages of 25 and 64).

⁸ As of 2009, the Federal Poverty Guideline for a 2 person family was \$14,570 while the maximum income at which a childless couple with one tax filer earned the EITC was \$13,530.

Inequality and Wages

Because the EITC induced such sizeable increases in employment, standard estimates of labor demand elasticity lead to the expectation that wages will change. Although research surrounding the area of the EITC's wage effects is limited, the few studies that have been done find evidence of modest wage effects induced by the credit. Using different methods, Leigh (2009), Azmat (2006), and Rothstein (2008) all conclude that the EITC decreases wages in the labor market for low-skilled workers which leads to increased economic inequality between EITC recipients and non-recipients.

Azmat (2006) used the United Kingdom's Working Families Tax Credit (WFTC) as the basis for his analysis. The structure of the credit is similar to that of the United States' EITC; however, the WFTC payouts are distributed through the wage packets of employees meaning that employers are fully aware of who receives the credit and how much each person receives.⁹ As a consequence, under the WFTC, employers have the information necessary to deliberately lower the wages of benefit recipients. Azmat (2006) finds that among male credit recipients, 35 percent of the incidence is on the employer while, for female recipients, the incidence is entirely on the employee. For males, the difference is attributed to employer discrimination in cutting the wages of claimant employees relative to similarly skilled non-claimant workers. Further, evidence of modest spillover effects for both males and females is seen by the declines in the wages of non-recipient coworkers. Industry spillover effects on weekly wage rates range from -0.2 percent to -0.3 percent. These results suggest that, despite employer knowledge about which employees receive the credit, the wage changes are not confined to

⁹ Similarly, the federal EITC in the United States allows for advance payments of the credit. The payment is distributed evenly and included in an employee's paycheck. However, the take-up rate is extremely low at only 3% of EITC recipients (Government Accountability Office 2007).

recipients. Thus, those who do not receive the WFTC suffer declines in wages and do not receive the subsidy.

Using a simulated instrument approach, Rothstein (2008) estimates the impact of the federal EITC on hourly wages. He exploits the variation across family types and skill levels to identify the effect of the mid 1990s EITC expansions. Rothstein (2008) concludes that for every \$1 of EITC payments, the wages of eligible employees fall by \$0.30 while the wages of ineligible workers decrease by \$0.43. Thus, low-skilled mothers keep \$0.70 of every dollar they receive. Additionally, employers of low-skill labor hold \$0.72 (\$0.30 from single mothers and \$0.43 from ineligible employees) and the net transfer to low-skill workers is less than \$0.28 per dollar spent. Clearly, Rothstein's (2008) findings provide evidence that the net wages of employees who are not EITC eligible fell in the years following the program's expansion.

In his analysis Andrew Leigh (2009) exploits variation in state EITCs to estimate the effect of the subsidy on gross wages. He finds evidence that a 10 percent increase in the benefit level of the EITC correlates with a 5 percent decrease in the hourly wages of high school dropouts and a 2 percent decrease in wages of high school graduates. The wages of college graduates were unaffected. To check the robustness of his results, Leigh (2009) also exploits variation in the federal EITC across gender, age, and education. The results were consistent with the earlier analysis, suggesting that the wage effects were due to the policy rather than other factors; that is, the increase in the federal EITC caused labor supply to increase and real hourly wages to fall.

An important finding to arise out of Leigh's (2009) analysis is that the wage effects were similar across workers with and without children. His results lead one to conclude that the mean EITC eligibility in an individual's labor market sector affects the extent to which the wages will change following an increase in EITC generosity; rather

than an individual's EITC eligibility status (Leigh 2009). His evidence is consistent with the standard model of tax incidence presented earlier in the chapter. That is, the labor supply increase caused by the subsidy increase affects the wages of all workers in a labor market, not just those who are eligible for the benefit.

OUTREACH CAMPAIGNS AND EITC PARTICIPATION RATES

The EITC is often preferred to the minimum wage because its key interventions occur after the labor market clears. That is, rather than mandating employers to pay higher wages and disrupting the labor market, the EITC takes the form of a post-wage subsidy distributed by the government. However, the IRS, employers, non-profit organizations, and other interest groups hold outreach campaigns aimed to inform low-income, potentially eligible workers about the EITC and encourage them to file and claim the benefits. The outreach campaigns of large employers create economic concerns of asymmetric information and changes in wage elasticity.

Large outreach campaigns may make employers less willing to increase the wages of low-income workers if they have the knowledge that the majority of their employees are or may be receiving wage subsidies in the form of the EITC. While employers' demand for labor become less elastic, employees are still willing to work at offered wages and perhaps more likely to work because of the earnings subsidy. But, employers, the party with an inelastic demand for labor, benefit from the subsidy and allow the government to essentially increase employee wages. Meanwhile, employers allow actual wages paid to employees to remain constant or increase minimally, relative to overall economic growth.

A substantial body of evidence concluded that the federal Earned Income Tax Credit increases the labor supply of single women with children. However, little is

known about the effects that the influx of new labor has on wage rates. Building off of the evidence of Azmat (2006), Rothstein (2008), and Leigh (2009), I argue that the current benefit levels and structure of the EITC increase the inequality between employees with and without children. Using Leigh's (2009) observation that the mean level of EITC eligibility in a labor market determines the effect of an increase in the credit's generosity on wages, I examine variation in wages across labor market occupation groups with high concentrations of EITC eligible employees. Using two measures of the EITC, the claim rate and the size of the credit, I distinguish between the effects of a change in visibility from a change in generosity. Ultimately, the change in visibility should have the largest effect on wage levels.

Chapter 3: Methodology

Economic theory of tax-incidence and previous research suggest non-zero effects of expanded EITC generosity on the wages of low-educated, female workers. There are two distinct and plausible effects of the EITC on wages. The first proposes that the entry of new workers into the labor market places a downward pressure on wage rates. Given the increase in the labor force participation of single mothers following the expansion of the EITC, declining wages should be expected. The second possible effect of the EITC on wages depends on the distribution of workers on the EITC schedule and the relative elasticity of participation and hours worked with respect to the wage rate (Eissa and Nichols 2005). Growth in labor force participation within the phase-in region lowers pre-tax wages because of the substitution effect, while decreases in hours worked in the phase-out region have a net effect of increased wages. Because the majority of labor supply growth following recent EITC expansions occurred on the extensive margin (labor force participation responses were larger than hours-of-work responses), I hypothesize a dominant substitution effect resulting in a decline in the overall wages of low-skilled workers.

In this report, I attempt to analyze the effects of the EITC on the wages of all low-wage workers in the period following the largest expansion of the EITC to date, using aggregate state-level data for seven carefully selected occupation categories. The questions that I aim to answer are:

1. Does the subsidy to wages provided by the EITC result in altered employer behavior concerning the wages paid in occupations with large shares of EITC recipients?

2. Do changes in the EITC recipient share and the maximum EITC benefit level produce similar labor market outcomes?

The minimal literature on the subject cites the share of EITC eligibles in a labor market over the maximum credit value as the driving factor in firm behavior. Still, the maximum credit value plays an important and separate role by providing incentives to increase labor supply, which, in turn, increases the share of EITC eligibles in a given labor market.

A MODEL FOR MEASURING THE EITC'S EFFECT ON WAGE LEVELS

Using the median wages of the occupations with the highest shares of EITC recipients, I seek to measure the variation that is attributable to the EITC. Because I am interested in drawing conclusions about the policy effects of the EITC on the entirety of the market, my analysis occurs at the state level and uses cross-sectional, annual data for each state and the District of Columbia to construct a panel data set for 1999 through 2007. This period of analysis was selected because it follows a period of major change in the structure and generosity levels of programs for low-income individuals, including the EITC, and allows time for the effects of multiple program changes to fade out. Also, it includes periods of varying economic strength. Further, while the analysis ideally would have started with data from 1997, a lack of consistency in the coding of the dependent variable, median wages by occupation, until 1999 restricted the ability to compare median wages across the across earlier analysis periods.

As mentioned earlier, the key variables of interest are the median annual wages for each of the seven occupation classifications that have the highest shares of EITC tax

filers¹⁰: Food Preparation, Maintenance, Sales, Office Administration, Construction, Production, and Transportation. The Bureau of Labor Statistics (BLS) Occupational Employment Statistics (OES) provided median wage data by state for each occupation code from 1999 to 2007. Median wages are used rather than average wages to obtain a more robust measure of wages for each occupation and to focus on program impact on the typical recipient. Further, I use median annual wages rather than median hourly wages in an effort to provide a clearer depiction of the annual effects of changes in EITC benefit levels. Essentially, this simplifies the understanding at the policy level by removing the process of converting median hourly wage elasticities to median annual wage levels. Finally, the EITC is calculated using annual income levels, as are most public benefits; as such, logic implies that the appropriate level of analysis for studies evaluating their effects should occur on an annual, rather than hourly, wage basis.

The key inferential policy variables in this analysis are the share of EITC recipients by state and the maximum EITC benefit level for each state and year. These variables were selected based on their theoretical and previously exhibited effects on the wage rates of employees in low-wage sectors. The share of EITC eligibles in a labor market sector¹¹ is believed to influence the behavior of firms in wage rate decisions. The share of EITC tax returns¹² by state and historical EITC benefit levels¹³ were obtained from the Tax Policy Center. Maximum EITC benefit levels were constructed for each

¹⁰ Data on the rate of EITC tax returns by occupation code were obtained from The Brookings Institution Metropolitan Policy Program. Occupations are classified by BLS OES codes and reflect information from 2007 tax filers.

¹¹ The use of “sector” over “occupation” is intentional, as it refers to the findings of Azmat (2006), Rothstein (2008), and Leigh (2009).

¹² The Tax Policy Center obtained the data from the IRS, Statistics of Income Division, Individual Master File System and performed the calculations.

¹³ The Tax Policy Center obtained the data for 1999-2003 from the Joint Committee on Taxation; Ways and Means Committee, 2004 Green Book and the data for 2004-2007 from the IRS.

state and family size to account for the higher maximum levels in states that offer state EITCs in addition to the federal credit.¹⁴ To simplify the analysis process and the number of regression models used, I constructed a single EITC maximum benefit variable that weights maximum benefit levels by the share of each family structure type (childless, one-child, or two or more children) filing for the EITC in a given year:

$$(1) \quad \text{Weighted Max EITC}_{jt} = P_{0jt}(\text{MaxBenefit}_{0jt}) + P_{1jt}(\text{MaxBenefit}_{1jt}) \\ + P_{2jt}(\text{MaxBenefit}_{2jt})$$

P_{ijt} is equal to the percent of EITC recipients with i qualifying children, in state j , that claimed the EITC benefit in year t . MaxBenefit_{ijt} is equal to the maximum EITC benefit for a family with i qualifying children, in state j , in year t . In the equation above, the subscript i is replaced by 0, 1, or 2 which reflects the number of qualifying children; note that 2 reflects two or more qualifying children.

The analysis also includes a number of control variables that are widely acknowledged to influence median wage levels. These additional explanatory variables fit into the three broad categories: policy, economic, and demographic. The policy variables consist of programs and laws that either supplement wages or mandate wage rates. The second group of control variables measures certain economic factors known to affect wage rates (e.g. state Gross Domestic Product per capita and the unemployment rate). A third category of variables controls for the varying demographics of each state's population that may influence wage levels (e.g. poverty rate, educational attainment, size of the working age population, racial composition). A complete list of variables, summary statistics, and variable sources is included in the Appendix.

¹⁴ Max benefit level for a state with an EITC is equal to $\text{FEDMAX}_{it} * (1 + \text{State Credit Rate}_{it})$, where i reflects the number of qualifying children and t reflects the year for which the max benefit is calculated.

It is also important to note that all dollar values used in the analysis are expressed in real terms and are deflated using the Consumer Price Index (CPI)¹⁵ for the region in which each state is located (Northeast, Midwest, West, South). The reasoning for this is twofold. First, dollar values are deflated to account for inflation over the nine-year period of analysis. Second, regional CPIs are used, as opposed to the national CPI, to control for regional differences in inflation that are likely to affect regional wage growth. This conversion, in addition to the aforementioned economic control variables, should dispel the changes in wages that are primarily due to the larger regional and national economic climates.

Using OLS regression, I estimate the extent to which each of the seven occupations' median wage levels changes in response to variations in the share of EITC recipients and the maximum benefit level. Rather than running separate models for each occupation, observations are pooled and dummy variables (fixed effects) are used to distinguish among them. This creates a total of 3,672 observations. The effects of the key inferential variables (EITC recipient share and EITC max benefit level) on each occupation are captured using interaction terms composed of the product of the dummies and the key inferential policy variables. Each key inferential policy variable is regressed in a separate equation to capture the individual and distinct effects of each one; multicollinearity confounds the results when the two are run in the same equation. The overall median wage for each state and year in the analysis period serves as the basis of comparison for the wage changes in the seven occupations.

Because of the high degree multicollinearity between the control variables and state fixed effect variables, state dummy variables are dropped from the primary models.

¹⁵ Base Period: 1982-1984=100

State fixed effects are still used to analyze the sensitivity of coefficient estimates. The primary models include occupation and policy variable interactions, along with carefully selected control variables from each of the three groups (i.e., policy, economic, and demographic). Additionally, natural log transformations are used for most of the non-dummy variables. I transformed the variables to simplify the interpretation of the results as elasticities and to render the distributions of the data more symmetrical.

Measuring the Wage effects of EITC Recipient Share

Equation 2 (below) measures the extent to which a one percent change in a state's EITC recipient share changes the median wages of each of the seven occupations, relative to the state's overall median wage.

$$(2) \quad \ln\text{MedWage}_{occ\ jt} = \beta_1 + \beta_2(D_{occ} * S_{jt}) + \beta_3\text{Policy}_{jt} + \beta_4\text{Economic}_{jt} + \beta_5\text{Demographic}_{jt} + \gamma_t + \varepsilon_{jt}$$

The natural log of the median wage rate for a specified occupation, occ , in a given state, j , and year, t , is represented by $\ln\text{MedWage}_{occ\ jt}$. The policy variable of interest in this analysis is represented by $(D_{occ} * S_{jt})$ which represents the interaction of a particular occupation, occ , and the share of EITC tax filers, S , in a given state, j , and year, t . The remaining terms represent the control variables for each state, j , and year, t . Year fixed effects are represented by γ_t .

Following the initial regression, I conduct a sensitivity analysis of the key coefficient estimates by dropping the control variables and replacing them with state dummy variables.

$$(3) \quad \ln\text{MedWage}_{occ\ jt} = \beta_1 + \beta_2(D_{occ} * S_{jt}) + \gamma_t + \lambda_j + \varepsilon_{jt}$$

After controlling for the time-invariant state specific effects, the coefficient estimates of the key explanatory variables remained strongly statistically significant and

were virtually equal to the estimates produced by the first model. This suggests that the majority of the variation in wages that is due to state-specific effects is controlled for in the primary model.

Measuring the Wage effects of EITC Maximum Benefit Levels

Equation 4 (below) measures the extent to which a one percent change in a state's maximum EITC benefit share changes the median wages of each of the seven occupations of interest, relative to the state's overall median wage.

$$(4) \quad \ln\text{MedWage}_{occ\ jt} = \beta_1 + \beta_2(D_{occ} * M_{jt}) + \beta_3\text{Policy}_{jt} + \beta_4\text{Economic}_{jt} + \beta_5\text{Demographic}_{jt} + \gamma_t + \varepsilon_{jt}$$

The natural log of the median wage rate for a specified occupation, occ , in a given state, j , and year, t , is represented by $\ln\text{MedWage}_{occ\ jt}$. The policy variable of interest in this analysis is represented by $(D_{occ} * M_{jt})$ which represents the interaction of a particular occupation, occ , and maximum EITC benefit in a given state, j , and year, t . The remaining terms represent the control variables for each state, j , and year, t . Year fixed effects are represented by γ_t .

Again, I follow the initial regression with a sensitivity analysis of the key coefficient estimates by dropping the control variables and replacing them with state dummy variables.

$$(5) \quad \ln\text{MedWage}_{occ\ jt} = \beta_1 + \beta_2(D_{occ} * M_{jt}) + \gamma_t + \lambda_j + \varepsilon_{jt}$$

And again, after controlling for the time-invariant state specific effects, the coefficient estimates of the key explanatory variables remained strongly statistically significant and were virtually equal to the estimates produced by the first model. This suggests that the majority of the variation in wages that is due to state-specific effects is controlled for in the primary model.

Using the methods presented in this section, I estimate the effects of increasing EITC claim levels and increased generosity on the wage rates of seven occupation groups with high shares of EITC eligible employees. The next section presents findings in support of previous research, which suggest that the increasing visibility of the EITC to employers places a downward pressure on the wages of employees in low-wage occupations.

Chapter 4: Findings

The methods described in the previous chapter seek to answer the following questions regarding the effects of the EITC on median wages and the extent to which the economic theories of tax-incidence and labor supply and demand hold true in the case of the EITC: To what extent do the economic theories of tax-incidence and labor supply and demand hold true in the case of the EITC? That is, does the subsidy to wages result in altered firm behavior concerning the willingness to increase wages in occupations with large shares of EITC recipients? Further, I seek to distinguish between the effects of EITC eligibility in a labor market and the effects of the maximum EITC benefit level, both of which theoretically influence the wage level.

The analysis produced two sets of coefficients of interest that provide the results necessary to answer the research questions. The first set consists of the interactions between each of the seven occupations and the share of EITC recipients from each state's total tax filers. The second set is made up of the interactions between each of the seven occupations and the weighted maximum EITC benefit level.

EITC RECIPIENT SHARE AND MEDIAN WAGES

Coefficient estimates for the effects of EITC recipient share on median wages were generated using OLS regression. The results of this regression are shown in Table 1. I used natural log transformations for most non-dummy variables; thus, results are interpretable as relative elasticities of the median wage level with respect to the share of the population claiming the EITC. The seven interaction terms that separately combine each occupation with the key policy variable, share of EITC tax filers in each state, provide estimates of the effects of changes in the share of EITC eligibles in a labor

market on the median wages of occupations with high shares of EITC recipients, relative to overall median wages.

Of the seven high-EITC share occupations analyzed, six have negative and highly statistically significant coefficient estimates for elasticity. The outlier, Construction, has a positive and statistically significant elasticity coefficient. Of the occupations with negative wage elasticities, Food Preparation has the greatest magnitude at -0.215 while Production has the lowest at -0.027. Thus, the results suggest that, for those occupations with the highest shares of EITC recipients, a 10 percent increase in the share of the population claiming the EITC corresponds with a decrease in wages of anywhere from 0.27 to 2.15 percent.

Additionally, the model controls for other factors that influence median wages in a state. For instance, the results suggest that a 10 percent increase in the minimum wage accounts for a 1.2 percent increase in median wages, suggesting that minimum wage policy changes are not fully realized by workers at the median level. This result is not surprising, as the minimum wage produces larger effects at the 25th percentile wage level rather than at the median. However, growth in the 50th percentile wage level that is induced by increases in the minimum wage likely reflects the shrinking gap between the lowest wage earners and those in the middle. The influence of education on median wages was also controlled for in the model. Across all states, each 10 percent increase in the percentage of residents who graduate from high school is associated with a 4.6 percent increase in median wages for the occupations included in the sample.

Table 1. EITC Recipient Share and Median Wage Levels

Dependent Variable: Natural logarithm of Median Wages	Elasticity
Key Policy Variables:	
Food Preparation x EITC Share	-0.215*** (0.0019)
Maintenance x EITC Share	-0.143*** (0.0019)
Sales x EITC Share	-0.110*** (0.0019)
Office Administration x EITC Share	-0.035*** (0.0019)
Construction x EITC Share	0.067*** (0.0019)
Production x EITC Share	-0.027*** (0.0019)
Transportation x EITC Share	-0.054*** (0.0019)
Policy Controls:	
lnminwage	0.121*** (0.0174)
lneitc_weighted	0.051** (0.0198)
refundable	0.002 (0.0044)
lnmaxbenefit	0.013* (0.0071)
Economic Controls:	
lngdppercap	0.144*** (0.0087)
lnunemp	0.053*** (0.0089)
lnpoverty	-0.012 (0.0098)
Demographic Controls:	
lnyouth25	-0.073** (0.0301)
lnelderly	-0.101*** (0.0152)
lnblack	0.015*** (0.0022)
lnhs_grad	0.463*** (0.0601)
lnba_grad	-0.034** (0.0134)
lnunion	0.044*** (0.0041)
linmigration	0.006*** (0.0013)
popdensity	0.006* (0.0019)
Year Fixed Effects:	
y2	0.001 (0.0055)
y3	0.005 (0.0056)
y4	0.009 (0.0061)
y5	0.005 (0.0064)
y6	-0.001 (0.0063)
y7	-0.012 (0.0064)
y8	-0.012 (0.0063)
y9	-0.014* (0.0060)
Intercept	6.901 (0.3128)
Number of Observations	3672
R-Squared	0.908
Adjusted R-Squared	0.907

*=statistically significant at 5% level, **=statistically significant at 1% level, ***=statistically significant at 0.1% level

To confirm the robustness of the coefficient estimates produced by the model, I estimated a second model using the same key influential policy variables but dropped the control variables and replaced them with state dummy variables to create a fixed effects model that controls for unobservable, state-specific, time-invariant factors affecting wages. The resulting coefficient estimates of the key policy variables from the state fixed effects model are nearly identical to those from the primary model. And, the adjusted R-squared statistic minimally increases from 0.9072 in the first model to 0.9131 in the fixed effects model, implying that the two models are nearly equivalent in explanatory power. Thus, the results are robust and the control variables used in the initial regression adequately capture the variation in median wages due to time-invariant state-specific effects.

EITC MAXIMUM VALUE AND MEDIAN WAGES

Coefficient estimates for the effects of the maximum EITC benefit level on median wages were generated using OLS regression. The results of this regression are shown in Table 2. I used natural log transformations for most non-dummy variables; thus, results are interpretable as relative elasticities of median wages with respect to the maximum EITC value. The seven interaction terms that separately combine each occupation with the key policy variable, maximum EITC value, provide estimates of the effects of changes to the maximum EITC value on the median wages of occupations with high shares of EITC recipients, relative to overall median wages.

Of the seven occupations analyzed, six experience negative and highly statistically significant wage effects associated with increases in the maximum EITC value. As in the EITC share model, Construction is the outlier and experiences positive and statistically significant wage growth associated with increases in the maximum EITC

value. The six occupations for which median wage declines are predicted have wage effect magnitudes ranging from -0.08 to -0.01. Thus, holding all else constant, a 10 percent increase in the maximum EITC benefit level is estimated to decrease median wages by 0.1 to 0.8 percent, relative to overall median wages.

Table 2. Maximum EITC Benefit and Median Wage Levels

Dependent Variable: Natural Logarithm of Median Wages	Elasticity
Key Policy Variables:	
Food Preparation x EITC Value	-0.080*** (0.0006)
Maintenance x EITC Value	-0.053*** (0.0006)
Sales x EITC Value	-0.041*** (0.0006)
Office Administration x EITC Value	-0.013*** (0.0006)
Construction x EITC Value	0.026*** (0.0006)
Production x EITC Value	-0.010*** (0.0006)
Transportation x EITC Value	-0.020*** (0.0006)
Policy Controls:	
lnminwage	0.117*** (0.0160)
refundable	0.012*** (0.0035)
lnmaxbenefit	0.030*** (0.0064)
Economic Controls:	
lngdppercap	0.152*** (0.0080)
lnunemp	0.056*** (0.0082)
lnpoverty	-0.054*** (0.0090)
Demographic Controls:	
lnyouth25	-0.075** (0.0277)
lnelderly	-0.088*** (0.0140)
lnblack	0.014*** (0.0019)
lnhs_grad	0.487*** (0.0550)
lnba_grad	-0.026* (0.0121)
lnunion	0.045*** (0.0038)
linmigration	0.006*** (0.0011)
popdensity	0.006*** (0.0018)
Year Fixed Effects:	
y2	0.000 (0.0051)
y3	0.003 (0.0052)
y4	0.002 (0.0056)
y5	-0.004 (0.0059)
y6	-0.011* (0.0058)
y7	-0.022*** (0.0058)
y8	-0.021*** (0.0057)
y9	-0.020*** (0.0055)
Intercept	7.114 (0.2482)
Number of Observations	3672
R-Squared	0.922
Adjusted R-Squared	0.921

*=statistically significant at 5% level, **=statistically significant at 1% level, ***=statistically significant at 0.1% level

Control variables from each of three sets of wage determinants (i.e., policy, economic, and demographic) were included in the model, and all have statistically significant effects on the median wages of the occupations in the sample. The magnitudes of their effects, however, vary greatly. Not surprisingly, as the share of high school graduates increases, median wages grow. A 10 percent increase in the portion of the population with a high school diploma corresponds with a 4.87 percent increase in median wages, holding all else constant. Similar to the results of the EITC recipient share model, a 10 percent increase in the minimum wage corresponds with a 1.17 percent increase in the median wages of the occupations included in this sample. The economic climate of states also plays a significant role in determining median wage rates. This is reflected by the estimate that a 10 percent increase in state Gross Domestic Product per capita corresponds with a 1.5 percent increase in median wages. Also worth noting is the small but positive and significant effect that the share of unionized employees in a state has on the median wage level of the occupations in the sample.

As I did with the EITC share model, I estimated a second model for the effect of the EITC maximum benefit level on median wages. It used the original key influential policy variables but replaced the control variables with state dummy variables to create a fixed effects model. Controlling for unobservable, state-specific, time-invariant factors affecting wages, I confirm the robustness of the results obtained in the primary model, as the coefficient estimates produced by the fixed effects model are nearly equivalent to those in the primary model. Further, the adjusted R-squared statistics were virtually equal at 0.9213 for the primary model and 0.9291 for the fixed-effects model. These results suggest that the control variables used in the primary model adequately capture the variation in median wages that is attributable to time-invariant state-specific effects.

The findings of this analysis suggest that the visibility of the EITC to employers has a larger effect on median wages than the size of the EITC benefit. This provides a basis for the economic concerns of asymmetric information on the part of employers that was briefly mentioned at the end of Chapter 2. Evidently, as the share of low-income workers claiming the EITC grows, employers become increasingly aware of the benefits received and respond accordingly by offering lower wages.

Because the models used for the analysis draw on aggregate, state level data, one must take care when drawing conclusions about the wage effects for individuals using the findings presented here. Caution must be given to the ecological fallacy, which assumes that individual members of a group have the average characteristics of the entire group. Still, the results obtained in the analysis are robust across a number of sensitivity checks and can certainly be used to draw inferences about the effects of EITC on the low-wage labor market. A problem encountered when using aggregate level data is the canceling out of effects over time, however, this analysis still found significant changes in wage rates over time, despite the aggregate nature of the data.

Chapter 5: Discussion and Policy Implications

Using OLS regression, I measure the extent to which median wages of the occupations with the highest shares of EITC recipients change in response to variations in the share of EITC recipients and the maximum EITC value. The analysis includes policy, economic, and demographic control variables that are known to influence median wage levels. The results confirm the findings of previous studies of the effects of the EITC on the wage rates of employees in high-EITC eligibility occupations. I find that a 10 percent increase in the share of individuals claiming the EITC corresponds with annual median wage growth rates among high EITC eligible occupations that are 0.27 to 2.15 percent lower than that of annual median wages. Further, every 10 percent increase in maximum EITC value corresponds with median wage growth rates for high EITC eligible occupations that are 0.1 to 0.8 percent lower than that of overall annual median wages. These results may seem minimal relative to the net change in income for EITC recipients, but they have important implications on the level of inequality between EITC eligibles and non-eligos.

Consider the following scenario. Two employees work in Food-Preparation and have equal salaries of \$20,000 per year and live in a state without a state EITC, let's say Kentucky. Employee A is a single mother with two qualifying children. Employee B is an unmarried male with no qualifying children, he does however, pay child support for two children from a previous relationship. The following equations calculate each employee's EITC benefit in 2007:

$$\text{Employee A: } \text{EITC Benefit} = 0.40(11,790) - 0.2106(20,000 - 15,390) = \$3,745.13$$

$$\text{Employee B: } \text{EITC Benefit} = 0.0765(5,590) - 0.2106(20,000 - 7,000) = \$0$$

Now, consider that Kentucky experiences a 10 percent increase in the share of tax filers claiming the EITC in 2007. This increase corresponds with a wage growth rate for Food-Preparation occupations that is 2.15 percent lower than that of overall median wages. Thus, both Employee A and Employee B have annual pre-tax wages that are nearly \$430 lower than they would have been without the growth in EITC tax filers. But, Employee A's EITC benefit more than compensates for the lack of growth in wages. Employee B, however, has an earned income that is too high to qualify for the EITC, has an income tax liability, and his wages grow at a rate slower than that of overall median wages. Yet, he still has to pay his monthly child support payments and must do so with fewer real resources.

The preceding example highlights the potential inequality that arises between low-wage workers with and without qualifying children as an unintended consequence of the EITC. Initially, the wage effects of an increase in the share of the population claiming the credit or an increase in the maximum benefit level may seem minimal relative to the potential size of the credit for qualifying individuals. However, these effects depress the wage growth of entire labor market sectors and, as such, affect EITC eligibles as well as non-eligos alike. The difference, of course, is that EITC eligibles receive subsidies that off-set the slower wage growth, while non-eligos do not. Meanwhile, the credit for those without qualifying children phases out prior to reaching the federal poverty line for an individual. Thus, the EITC inadvertently exacerbates inequality between workers with and without qualifying children, even when non-custodial parents may be financially responsible for children,

Between 1979 and 2007, the labor force participation rate for among men fell by 6 percentage points; while, for those males with only a high school diploma, it dropped by 9 percentage points. Comparatively, during the same time period, the labor force

participation level of women rose by 4 percentage points and by 5 percentage points for women with only a high school diploma (Edelman et. al. 2009). The trend of declining real wages is cited as a factor contributing to the drop in participation among men. However, the expansion of EITC benefits between 1994 and 1996 is also cited as an explanation because of the minimal benefits realized by men who are not raising children. Indeed, evidence concludes that females made up the subset of the population receiving the greatest returns to work, while males suffered from the same effects of the declining real wage along with minimal incentives to increase labor force participation (Edelman et. al. 2009).

Policy Recommendations

For the EITC to fully recognize its goals of increasing the incentive to work and providing a modest supplement to the wages of low-income workers, benefit levels must be expanded for working poor individuals without qualifying children. The current benefit structure and eligibility standards do not adequately address the goal and actually hinder, rather than help, those without qualifying children. As it stands now, single childless adults are the only Americans that the federal income tax *taxes* into poverty (Center on Budget and Policy Priorities 2009). If policymakers are genuinely concerned with the economic stability of all low-wage workers, they will increase the benefit levels for workers without qualifying children to a level closer to that of individuals with qualifying children, thereby reducing the level of inequality between the two groups.

Some argue that expanding the benefits of individuals without qualifying children will induce labor supply increases similar to those seen following the generous benefit expansions for workers with qualifying children. Such labor supply increases combined with an unchanged demand on the part of employers would theoretically decrease the

overall wage rate in the low-skill labor market and further exacerbate the effects examined in this report. However, it is important to note that the large increase in the labor supply of single females with children in the mid-1990s was spurred by a number of policy changes that increased work incentives among that population. The EITC benefit expansion was only responsible for 2.8 percent of the labor force participation among single mothers (Eissa and Liebman 1996). Therefore, it is reasonable to assume that, all else equal, the increased labor supply induced by an expansion of EITC generosity for workers without qualifying children should induce minimal wage effects and result in larger net incomes for that population. Even if the labor supply of workers without qualifying children increases, the additional EITC benefits should offset diminished wage rate growth.

In addition to expanding the eligibility requirements of the EITC, actions must be taken to counter the wage depressing effects of the program. It is not enough to simply expand the pool of eligible recipients. Employers must be held accountable for capitalizing on asymmetric information and lowering the wages of their potentially EITC eligible employees. Almost certainly, expanding EITC eligibility will increase the extent to which employers behave in said manner, as the proportion of their employees that is eligible for the credit will increase dramatically, removing speculation as to which employees are eligible.

Over time, if left unaddressed, the wage depressing effects of the EITC could prove to exacerbate the inequity between low-skilled and skilled labor. The federal minimum wage is one existing policy tool that can be used to ensure that wages will not sink below a predetermined threshold. Still, the real value of minimum wage level is not reflective of current economic conditions since it often goes years without being adjusted for economic growth. For the minimum wage to effectively combat the wage depressing

effects of the EITC, it must be updated and adjusted on a regular basis. In addition to being adjusted for inflation, increases should factor in the nearly 1 to 2 percent decline in the wages of low-wage workers that occurs due to the EITC.

Still, regular adjustment of the minimum wage is only one tool to combat the unintended consequences of the EITC. Policymakers must institute a process whereby employers are held accountable for the wages they offer. Employer behavior aligns with theoretic expectations about the incidence of a subsidy. Employers receive an unintended subsidy from every dollar the government provides as a tax credit; each dollar employees receive from the EITC is a dollar that employers need not provide.

To penalize employers for acting in a rational manner may, at first glance, sound unfair. But, consider that the minimum wage exists, in part, to protect workers from overly rational employers who might otherwise offer very low wages to keep production costs low. As the wage depressing effects of the EITC compound, similar measures must be implemented to mitigate the problem. Employer behavior will certainly change if negative wage behavior results in the realization of a financial loss. One possible policy action proposes that the government conduct an annual wage review of employers in high EITC eligible occupations. If consecutive reviews combine to reveal evidence of stagnated wage growth for an employer, fines will be levied. By fining offending employers, the government is, in a sense, requiring the repayment of the portion of the EITC subsidy initially captured by the employer when wage growth stagnated. At the same time, the knowledge by employers that they will be held accountable for capitalizing on the existence of the EITC should deter wage depressing behavior.

Almost certainly, imposing fines on employers would be a politically difficult feat. Another means of holding employers accountable relies on widespread awareness campaigns. The United States Department of Labor (DOL) could perform semi-annual

studies of the EITC wage effects, the results of which are broadly distributed to increase public consciousness of the issue. This practice puts additional pressure on employers--public perception is important and valuable. Finally, more rigorous enforcement of wage and hour laws could be achieved by restoring a balance of power on the National Labor Relations Board (NLRB).

If given a greater sense of empowerment, employees may organize and fight to keep real wages from falling significantly. Empirical evidence suggests that unionization serves to reduce wage inequality by standardizing wages across jobs (Katz and Autor 1999). Indeed, unionization proves to have a positive and significant effect on the median wages of the occupations included in my analysis. Further, Freeman and Medoff (1984) find that the inequality reducing effects of unions outweigh the rise union/nonunion wage inequity. The decline of unionization in the United States disproportionately affected less-educated males and contributed greatly to wage inequality among men (Freeman 1993, Card 1998). This evidence suggests that, by organizing, employees gain the ability assert power over the EITC's wage depressing effects and can act to limit the potential wage inequality induced by the EITC.

The EITC is the most effective and best targeted anti-poverty program, but there is room for improvement. Imagine how many more individuals would be lifted above the poverty line if the benefits were expanded to workers without qualifying children? There seems to be a disconnect and fundamental flaw in the system when a non-custodial parent who owes child support and works full-time at the minimum wage is ineligible to receive EITC benefits, but would receive the maximum credit if he/she could claim his/her child. This report does not aim to detract from the many positive effects associated with the federal Earned Income Tax Credit. Increased labor force participation and substantial poverty reduction among working families are noble accomplishments. However, as our

poverty reduction and safety-net programs steadily aim to reward work and the “deserving poor” policymakers must not overlook working-poor individuals without qualifying dependent children. It is critical for policymakers to recognize the unintended consequences of the EITC and promote strategies to mitigate its wage depressing effects.

Appendix

Variable Name	Description	Mean	Std. Dev
Median Wage	Natural log of the median wage of all OES occupations	9.617	0.125
Food Preparation	Natural log of median annual wage of all occupations under SOC code 35	9.027	0.080
Maintenance	Natural log of median annual wage of all occupations under SOC code 37	9.227	0.102
Sales	Natural log of median annual wage of all occupations under SOC code 41	9.315	0.098
Office Administration	Natural log of median annual wage of all occupations under SOC code 43	9.522	0.106
Construction	Natural log of median annual wage of all occupations under SOC code 47	9.807	0.179
Production	Natural log of median annual wage of all occupations under SOC code 51	9.543	0.103
Transportation	Natural log of median annual wage of all occupations under SOC code 53	9.468	0.080
EITC Share	Natural log of the share of a state's population that claimed the EITC in a given year	2.717	0.283
EITC Value	Natural log of the maximum EITC value weighted by the share of each family structure type (childless, one-child, or two or more children) filing for the EITC in a given year	7.380	0.094
lnminwage	Natural log of the highest of state or federal minimum wage	1.103	0.098
lngdppercap	Natural log of State Gross Domestic Product divided by state population	3.010	0.245
lnunemp	Natural log of the not seasonally adjusted annual unemployment rate	1.517	0.250
Inpoverty	Natural log of the share of a state's population below the federal poverty line (3-year average of CPS poverty rates)	2.433	0.257
lnyouth25	Natural log of the share of a state's population below age 25	3.550	0.067
lnelderly	Natural log of the share of a state's population age 65 or older	2.524	0.158
lnblack	Natural log of the share of a state's population identifying as black.	1.858	1.183
lnhs_grad	Natural log of the share of state's population that's completed high school	4.452	0.046
lnba_grad	Natural log of the share of state's population that's completed a bachelors degree	3.257	0.197
Inunion	Natural log of the share of nonagricultural wage and salary workers covered by a collective bargaining agreement	2.358	0.504
Inimmigration	Natural log of the number of immigrants by state of intended residence	8.686	1.501
popdensity	Natural log of the number of people in a state divided by the state's total LAND area	4.519	1.536
y1-y9	Year dummy variables		

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