

Distinguishing Between Short-Term and Long-Term Recipients of the Earned Income Tax Credit

Abstract - Since its enactment in 1975, the Earned Income Tax Credit (EITC) has evolved from a small program to alleviate some of the tax burden of the payroll and income tax on low-income working parents to become a significant part of the Federal government's redistribution efforts. This paper presents preliminary work from a unique data set and is meant to raise questions as well as present new evidence regarding the EITC. This study examines a panel of taxpayers over 15 years to determine the extent to which the EITC acts as a safety net for workers experiencing temporary income and employment shocks. I find that between 40 and 50 percent of EITC recipients claim the EITC for short periods of time (one to two years). Finally, I provide descriptive information about the characteristics of temporary versus more permanent EITC recipients, with a particular focus on the effects of changes in the economy and state welfare policies.

INTRODUCTION

During the almost 30 years since its creation, the Earned Income Tax Credit (EITC) has expanded from a small program costing \$2.4 billion annually to a significant mechanism for transferring income to the poor, representing \$38.2 billion annually. The growth in the EITC can be seen clearly from expenditure data. Figure 1 shows Federal and State expenditures on transfer programs for the period 1976 to 2004. As can be seen in the figure, from 1976 until 1992 Aid to Families with Dependent Children and Temporary Assistance to Needy Families (AFDC/TANF) was the predominant means through which the Federal and State governments redistributed income to the poor.¹ However, during the 1990s there was a wholesale shift in the focus of benefits for the poor to a work incentive system as AFDC/TANF decreased in importance. The growth of the EITC presaged a decoupling of the transfer system from one based on eligibility for AFDC to

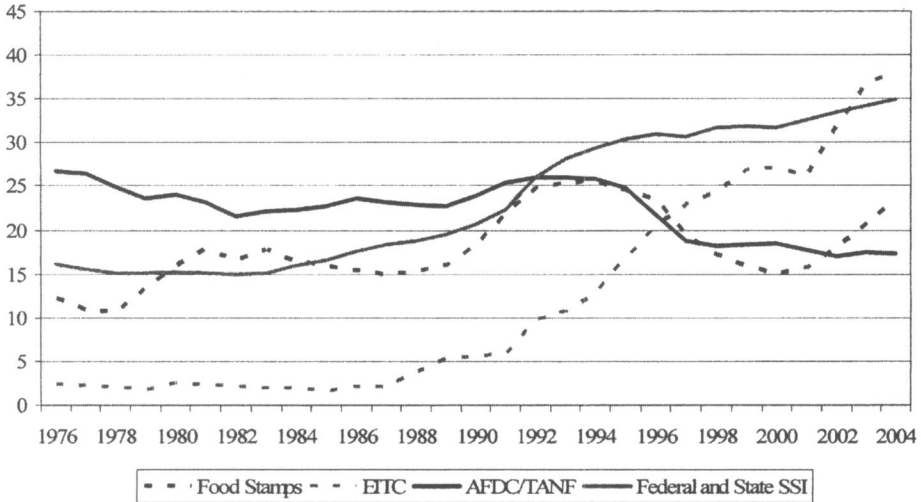
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¹ The largest transfer programs are Social Security and Medicare. In 2002, Social Security outlays totaled \$388 billion and Medicare was responsible for another \$257 billion (U.S. Congress, 2004). These two programs are aimed at the aged. Supplemental Security Income (SSI) also makes transfers to the elderly; in 2002, roughly 18 percent of SSI recipients were aged.

Figure 1. Major Federal and State Transfer Programs to the Poor (billions of 2000 dollars)



Source: National Income and Product Accounts Table 3.14 U from the Bureau of Economic Analysis and author’s calculations.

one based on poverty status and work. See Blank (2002) for a review of these changes and an analysis of their effects.

The EITC differs from other major transfer programs in that it is administered through the tax code, and there is no formal review process to determine eligibility. Eligibility for the EITC is dependent on filing a tax return and on having earned income. The credit is phased in up to a maximum income, and then, after a plateau region, it is phased out for taxpayers with Adjusted Gross Income above a certain threshold. Taxpayers must also meet a variety of criteria related to residency, tax-form-filing status, and number and age of children in the household. Since 1993 the EITC has been available to some taxpayers without children who meet certain age criteria.

Studies have shown that the decline in payments and the number of recipients under TANF is due to both changes in the economy and changes in policy. Grogger (2004) finds that changes to the AFDC/TANF program represented about 12 percent of the 1993 to 1999 decline in welfare

recipients. Moreover, Grogger (2004) finds that increased EITC benefits during the 1990s accounted for 10.5 percent of the decline in welfare caseloads. Klerman and Haider (2004) find that in the state of California, 50 percent of the decrease in the number of welfare recipients is due to falling unemployment rates in the 1990s.

As the number of welfare beneficiaries declines due to policy and economic conditions, it is possible that EITC usage increases. Hotz, Mullin, and Scholz (2005) use administrative data for the state of California to look at the employment effects of the 1994 expansion of the EITC. They provide evidence that changes in welfare policies during the 1990s in California increased the probability of claiming the EITC. Specifically, they find that a 100 percent enrollment rate in Welfare-to-Work for welfare recipients would increase the EITC claim rate by 2.3 percentage points.

This paper examines the effects of economic conditions and the changes in welfare policies on EITC usage nationally. Specifically, I look at the effects of

changes in the state unemployment rate, the generosity of state welfare benefits, and indicators of whether the individual lives in a welfare reform state.

This study uses information from a unique 15-year panel of taxpayers assembled from individual income tax return data to describe the characteristics of taxpayers that claim the EITC for short periods of time versus those who claim the credit over longer periods. By looking at the effects of economic conditions and the short-term nature of the usage of the EITC, this study provides a preliminary indication of the extent to which the EITC acts as a safety net for workers with temporary income and employment shocks. I find that over time a significant number of EITC recipients receive the EITC for short durations (one to two years), and that these episodes tend to be the result of temporary shocks to income or the number of children in the household. However, at the same time I find evidence that there is considerable persistence in claiming the EITC, with the effect of claiming the credit two years running increasing the probability of claiming the credit in the third year by 53 percent. I also find suggestive evidence that rising unemployment rates increase the probability that a taxpayer claims the EITC. Finally, I find preliminary evidence that suggests the value of monthly welfare benefits is negatively correlated with the probability of claiming the EITC.

There is one previous paper that has examined changes in EITC eligibility over time. Horowitz (2002) performs a duration analysis with survey data for the years 1975 to 1992 and finds that the main reason that taxpayers lose EITC eligibility is due to changes in income. This paper presents results that are largely consistent with the Horowitz (2002) analysis. In this

paper, I show preliminary work that is more descriptive in nature. This analysis also differs from Horowitz (2002) because I use administrative data that tracks actual EITC usage for the years 1989 to 2003 instead of changes in eligibility. In addition, I examine the effects of the overall economy and state welfare policies on EITC usage.

BEHAVIORAL EFFECTS OF THE EITC

Numerous studies have investigated the behavioral effects of the EITC. In particular, studies have found that the EITC unambiguously increases labor force participation for single parents. Eissa and Liebman (1996) find that the 1987 expansion of the EITC increased labor force participation by 2.8 percentage points for single parents.² Hotz, Mullin, and Scholz (2005) present evidence that the 1994 increase in the credit for families with two or more children increased labor force participation by as much as 3.7 percentage points for those families.³

In contrast to the positive effects of the EITC on labor force participation of single mothers, Eissa and Hoynes (2004) find that the EITC reduces labor force participation of married women. Married women are often the secondary workers in the family. As a result, the EITC generated by the primary worker's income produces an incentive for the secondary worker to leave the labor force through the income effect. Moreover, the combined income of the primary and secondary worker is likely to put the family squarely in the phaseout portion of the credit or outside of the range of the credit. Consequently, the secondary worker of an EITC eligible household is often subject to fairly significant marginal tax rates on her earned

² The 1986 expansion of the EITC increased the credit rate from 11 to 14 percent, reduced the phaseout rate to ten percent and indexed the maximum income and phaseout thresholds.

³ Among other things, the 1994 expansion increased the credit rate for two or more children from 19.5 to 30 percent, which resulted in an increase in the maximum credit from \$1,511 in 1993 to \$2,528 in 1994.

income, which are likely to reduce her labor supply.

A number of studies have attempted to estimate the effects of the EITC on the number of hours individuals work. Because most EITC recipients fall in the phaseout range of the credit, theoretically, the effect on hours of work should be negative. For the most part, the estimates have been small and statistically insignificant (Cancian and Levinson, 2005; Eissa and Liebman, 1996). Dickert, Houser, and Scholz (1995) find that the increased participation from new entrants as a result of the EITC is likely to more than offset any declines in hours of work as a result of the incentives to work fewer hours. Moreover, Grogger (2003) presents evidence that the EITC increased earnings for female-headed households and that those gains were largely the result of increased participation.

BACKGROUND AND HISTORY OF THE EITC

The EITC was initially created in the Tax Reductions Act of 1975, which was implemented in response to the 1974 and 1975 recession. The credit was enacted on a temporary basis for 1975, extended for the first six months of 1976, and then extended two more times through the end of 1978. In a discussion of the Congressional intent of one of the extensions through 1977, it is argued that "the earned income credit provides a work incentive for those with jobs that pay relatively low wages. It provides desperately needed tax relief to a hard-pressed group, who are faced with high food and energy prices and are subject to the payroll tax" (JCT, 1976, pp. 9–10). Moreover, in explaining the expansions of the EITC enacted with the Revenue Act of 1978, it was argued that "the Congress be-

lieved that the earned income credit is an effective way to provide work incentives and relief from income and Social Security Taxes to low-income families who might otherwise need large welfare payments" (JCT, 1978, pp. 51). Thus, the EITC was considered as a means for encouraging work instead of welfare reliance and assisting low-income workers.

Up through 1986, the EITC was extended and expanded a number of times, with the largest expansion occurring as a result of the Tax Reform Act of 1986. In 1986, the credit rate was increased to 14 percent, the minimum income for receiving the maximum credit was increased and indexed, and the phaseout rate was reduced to ten percent.⁴ After 1986, there were major expansions of the credit implemented in 1990, 1993, and 2001. The 1990 and 1993 expansions increased the credit rate and the phaseout rate, and introduced differential credits depending on the number of qualifying children. The 2001 expansion increased the EITC for married taxpayers filing jointly. These changes are shown in Table 1, which provides program parameter details for calendar years 1975 through 2003.

Since its inception, the EITC has been made permanent and expanded numerous times to include a far greater number of taxpayers. As can be seen in Figure 2, in tax year 1975, the first year of the EITC, there were 6.2 million returns claiming the EITC. This number stayed relatively constant through 1985 when 6.5 million returns claimed the EITC. However, with indexation of eligible income levels and increases in the credit enacted in 1986, the number of returns claiming the EITC almost doubled to 12.5 million returns in 1990. As a result of the 1990 and 1993 expansions, the number of EITC claimants in 1995 almost tripled from the 1975–1985 period, to 19.3 million returns. Finally, in

⁴ The motivation for continued increases in the EITC was that "further increases in the maximum amount and the phaseout level of the credit were necessary to offset past inflation and increases in the social security tax" (JCT, 1987, p. 27).

Federal Income Tax Credits for Low-Income Families

TABLE 1
EITC PARAMETERS, 1975–2003

Calendar Year	No. of Qualifying Children	Credit Rate (percent)	Min Income		Phase-Out Rate (percent)	Phase-Out Range			
			Max Credit	Max Credit		Non-Joint Filers		Joint Filers	
						Starting Income	Ending Income	Starting Income	Ending Income
1975–1978	1	10.00	4,000	400	10.00	4,000	8,000	NA	NA
1979–1984	1	10.00	5,000	500	12.50	6,000	10,000	NA	NA
1985–1986	1	11.00	5,000	550	12.22	6,500	11,000	NA	NA
1987	1	14.00	6,080	851	10.00	6,920	15,432	NA	NA
1988	1	14.00	6,240	874	10.00	9,840	18,576	NA	NA
1989	1	14.00	6,500	910	10.00	10,240	19,340	NA	NA
1990	1	14.00	6,810	953	10.00	10,730	20,264	NA	NA
1991	1	16.70	7,140	1,192	11.93	11,250	21,250	NA	NA
	2	17.30	7,140	1,235	12.36	11,250	21,250	NA	NA
1992	1	17.60	7,520	1,324	12.57	11,840	22,370	NA	NA
	2	18.40	7,520	1,384	13.14	11,840	22,370	NA	NA
1993	1	18.50	7,750	1,434	13.21	12,200	23,050	NA	NA
	2	19.50	7,750	1,511	13.93	12,200	23,050	NA	NA
1994	0	7.65	4,000	306	7.65	5,000	9,000	NA	NA
	1	26.30	7,750	2,038	15.98	11,000	23,755	NA	NA
	2	30.00	8,425	2,528	17.68	11,000	25,296	NA	NA
1995	0	7.65	4,100	314	7.65	5,130	9,230	NA	NA
	1	34.00	6,160	2,094	15.98	11,290	24,396	NA	NA
	2	36.00	8,640	3,110	20.22	11,290	26,673	NA	NA
1996	0	7.65	4,220	323	7.65	5,280	9,500	NA	NA
	1	34.00	6,330	2,152	15.98	11,610	25,078	NA	NA
	2	40.00	8,890	3,556	21.06	11,610	28,495	NA	NA
1997	0	7.65	4,340	332	7.65	5,430	9,770	NA	NA
	1	34.00	6,500	2,210	15.98	11,930	25,750	NA	NA
	2	40.00	9,140	3,656	21.06	11,930	29,290	NA	NA
1998	0	7.65	4,460	341	7.65	5,570	10,030	NA	NA
	1	34.00	6,680	2,271	15.98	12,260	26,473	NA	NA
	2	40.00	9,390	3,756	21.06	12,260	30,095	NA	NA
1999	0	7.65	4,530	347	7.65	5,670	10,200	NA	NA
	1	34.00	6,800	2,312	15.98	12,460	26,928	NA	NA
	2	40.00	9,540	3,816	21.06	12,460	30,580	NA	NA
2000	0	7.65	4,610	353	7.65	5,770	10,380	NA	NA
	1	34.00	6,920	2,353	15.98	12,690	27,415	NA	NA
	2	40.00	9,720	3,888	21.06	12,690	31,152	NA	NA
2001	0	7.65	4,760	364	7.65	5,950	10,710	NA	NA
	1	34.00	7,140	2,428	15.98	13,090	28,281	NA	NA
	2	40.00	10,020	4,008	21.06	13,090	32,121	NA	NA
2002	0	7.65	4,910	376	7.65	6,150	11,060	7,150	12,060
	1	34.00	7,370	2,506	15.98	13,520	29,201	14,520	30,201
	2	40.00	10,350	4,140	21.06	13,520	33,178	14,520	34,178
2003	0	7.65	4,990	382	7.65	6,240	11,230	7,240	12,230
	1	34.00	7,490	2,547	15.98	13,730	29,666	14,730	30,666
	2	40.00	10,510	4,204	21.06	13,730	33,692	14,730	34,692

Note: NA indicates not applicable.
Source: U.S. Congress (2004).

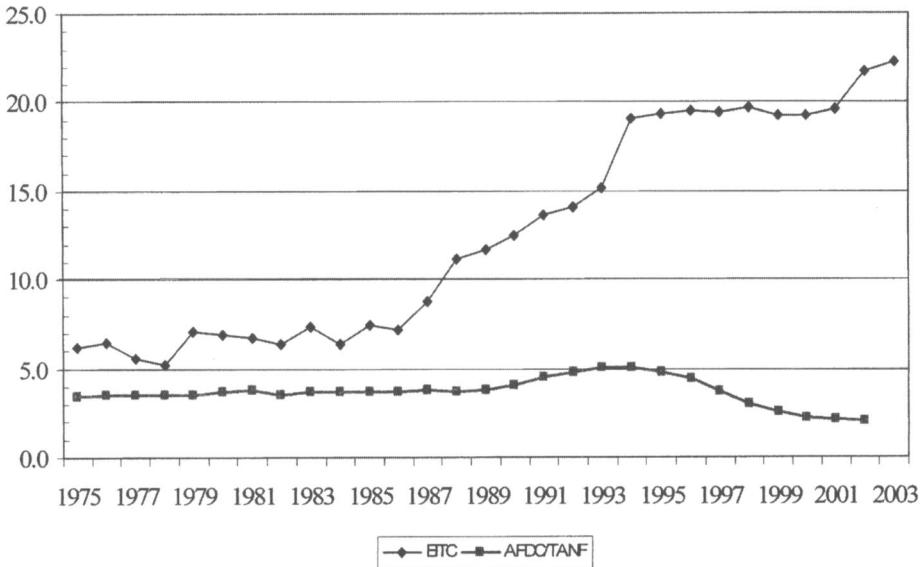
2003 there were 22.2 million returns claiming the credit, accounting for 17 percent of tax year 2003 returns.

EITC PARTICIPATION AND COMPLIANCE

Despite the increasing importance of the EITC as a mechanism for transferring income to the working poor, several studies indicate that there is a fairly sizable population that is eligible for the credit

but does not claim it. Blumenthal, Erard, and Ho (2005) estimate that of the population required to file a tax return, only 89 percent of those who were eligible for the credit claimed it in 1988. They estimate that the increases in the real value of the credit since 1988 would result in an increase in participation to 92 percent. Scholz (1994) estimates that for tax year 1990, between 80 and 86 percent of eligible taxpayers claimed the EITC. While these estimates point to a large popula-

Figure 2. Number of Taxpayers Claiming the EITC and Families Receiving AFDC/TANF (millions)



Source: U.S. Congress (2004), IRS (2002b, 2005), and Administration for Children and Families, Department of Health and Human Services (<http://www.acf.hhs.gov>).

tion that is eligible and not claiming the credit (potentially as many as two million families), the estimates also suggest that the overwhelming majority of the eligible population is receiving the credit and that the analysis of utilization over time will not be unduly affected by an increase in participation rates.

The participation rate for the EITC compares favorably with an estimated participation rate in the food stamp program of 54 percent for fiscal year 2002 (U.S. Department of Agriculture, 2004). Because the EITC is administered through the tax code, participation rates for the EITC are generally higher than means tested programs. However, higher participation rates do come at a cost; estimates of the number of returns with inappropriate EITC claims are often quite large. In a recent study, the IRS (2002a) finds that

for tax year 1999, up to 32 percent of EIC claims were erroneous. There have been a number of legislative attempts to reduce the non-compliance with the EITC. In particular, the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 required the use of Social Security numbers for each qualifying child; the Taxpayer Relief Act of 1997 enacted several penalties for those found fraudulently claiming the EITC; and, the Economic Growth and Tax Relief Reconciliation Act of 2001 enacted a number of changes to simplify the rules for the EITC. While non-compliance and the efforts taken to increase compliance are important areas for research, in this paper I ignore the effects of non-compliance or measures taken to reduce non-compliance, and simply look at those taxpayers who claim the credit.⁵

⁵ Changes in eligibility rules and increasing enforcement could result in an increase in the number of EITC recipients who receive the EITC on a more temporary basis.

DATA

The data used to distinguish between short-term and long-term usage and to examine the effects of economic conditions and welfare policies is the Continuous Work History Sample (CWHHS) for the period 1989 to 2003. This unique data set of taxpayers provides a wealth of information on taxpayers during a period including fairly substantial changes in the EITC benefit structure, as well as the size and structure of welfare benefits. In addition, there were two recessions during the time period spanned by the panel.

The CWHHS is a random panel of individual income tax returns created by the Statistics of Income division of the Internal Revenue Service. Selection into the panel is based on the last four digits of the primary taxpayer's Social Security number (SSN). Any taxpayer filing a return with the selected SSN as the primary SSN is included in the CWHHS sample each year.⁶

In the next section, I briefly examine results using the entire panel of taxpayers who are observed in all 15 years. Next, I shorten the 15 year panel to a three-year rolling panel, and restrict the sample to include only those taxpayers with children at some point during the three-year panel. The three-year rolling panel creates an observation for each consecutive three years that a taxpayer is observed. For example, a taxpayer observed in the years 1989, 1990, and 1991 would be one observation, while the same taxpayer observed in the years 1990, 1991, and 1992 would be another observation. This shorter time frame for the panel eliminates some of the attrition issues in the longer 15-year panel, and retains the richness of the panel without losing information about taxpayers who are

observed for shorter periods. Conditional on having a dependent child in at least one year between 1989 and 2003, there are 6,735 observations observed in all 15 years. In comparison, for the three-year rolling panel conditional on having a child at some point during the three consecutive years, there are 31,870 independent observations.⁷

PROBABILITY OF CLAIMING THE EITC FOR 15-YEAR PANEL OF OBSERVATIONS

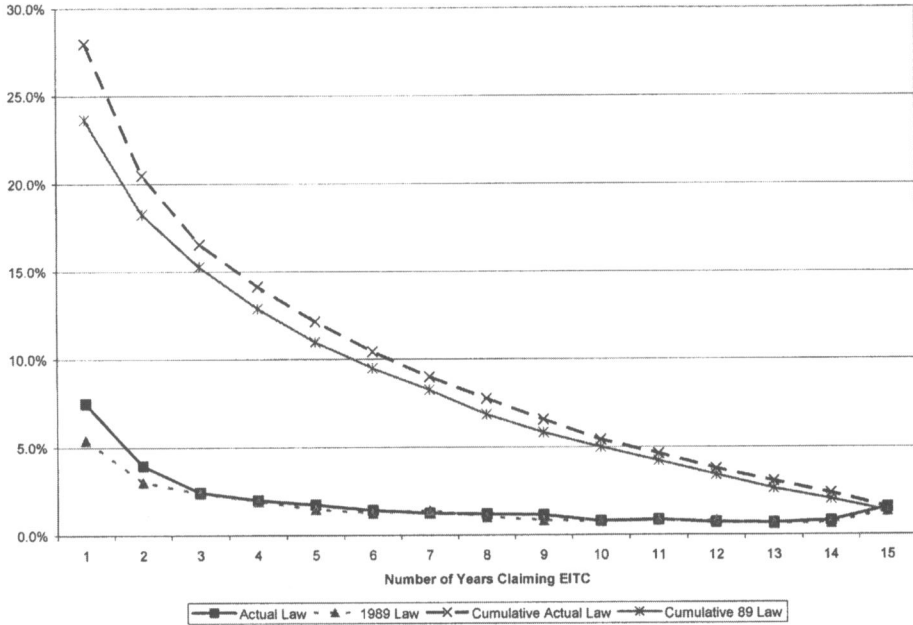
Figure 3 shows the probability of claiming the EITC by the number of years the credit was claimed. The figure provides an illustration of the influences of various changes in the credit on the likelihood a taxpayer would claim the credit by comparing the actual probability of claiming the credit with a simulated probability assuming that there were no further expansions in the EITC after 1989. The probabilities are conditional on being eligible for the EITC by either having a child at some point in the 15 years or being under the age of 65 in 2003. The dark lines show the probabilities for the actual law as experienced by taxpayers. The shaded lines are the simulated probability of claiming the EITC if the law stayed constant at its 1989 levels. The bottom two lines show the probability of claiming the EITC a specific number of times, while the upper lines show the cumulative probability of claiming the EITC at least that many times.

The probability of claiming the EITC only once for those in the panel is 7.5 percent. A constant 1989 law would have reduced the probability of claiming the EITC once from 7.5 to 5.4 percent and would have reduced the probability of claiming the credit twice from 3.9 to 3.0

⁶ Over the period 1989 to 2003, there is approximately eight percent attrition of CWHHS observations from one year to the next. Because the CWHHS does not pick up the secondary SSN, some of the attrition from the sample is due to single persons getting married and appearing as the secondary taxpayer rather than as a result of actually not filing a tax return. Moreover, the majority of secondary taxpayers are female, and consequently, the CWHHS panel is biased towards males.

⁷ There are 160,113 observations in the three-year rolling panel, but due to multiple observations for each taxpayer, there are only 31,870 independent observations.

Figure 3. Probability of Claiming EITC



Note: Conditional on observing all 15 years, and having at least one child or being under age 65 in 2003, there are 8,937 observations.

percent. The upper two lines show that the probability of claiming the EITC at least once is 28 percent under actual law and 24 percent if there were no expansions of the EITC. Once the sample is restricted to taxpayers with children, not shown here, the differences in probabilities between the constant 1989 law and the actual law virtually disappear. Much of the difference between the actual law and the 1989 law appears to be the result of the creation of the childless EITC; the expansion of the EITC to childless workers appears to have increased the number of taxpayers claiming the credit for short periods of time.

Figure 4a shows the same cumulative probabilities as Figure 3, but breaks down the probability by gender. In order to minimize the effects of gender differences caused by the sampling method, the figure shows only the probabilities for taxpayers who are never married during

the 15-year period. Because women are more likely than men to be single and raising children, they are much more likely to claim the EITC; women have a 43-percent probability of claiming the EITC at least once, while men have a probability of 27.4 percent. The changes in the law since 1989 have increased the probability of claiming the EITC at least once for women from 34 to 43 percent, while they have increased the probability for men more dramatically, from 13.3 to 24.8 percent. Figure 4b shows the results of restricting the sample to those with children at some point during the 15 years of the panel. The presence of children increases the likelihood of claiming the credit for both men and women substantially, and eliminates most of the differences between the actual law probabilities and the constant 1989 law probabilities.

Horowitz (2002) performs a study using data from the Panel Study of Income Dy-

Federal Income Tax Credits for Low-Income Families

Figure 4a. Cumulative Probability of Claiming the EITC by Gender

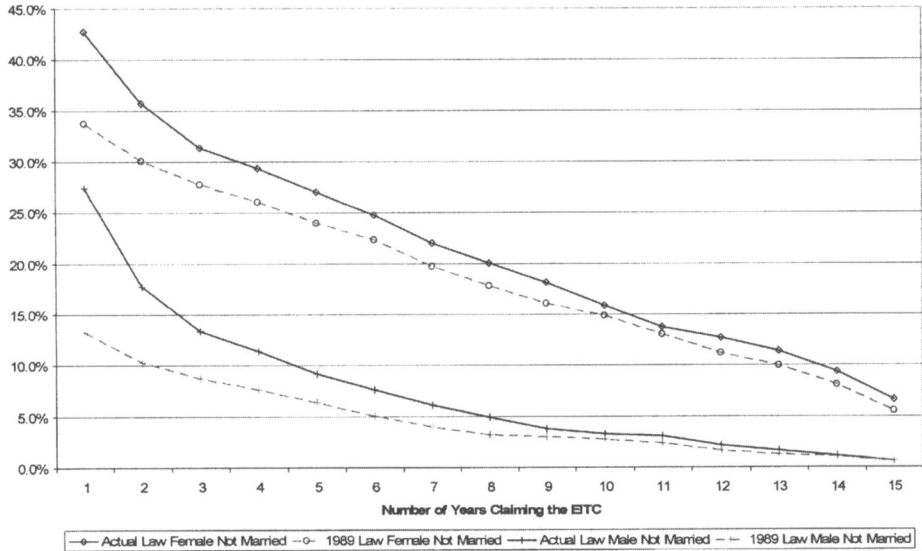
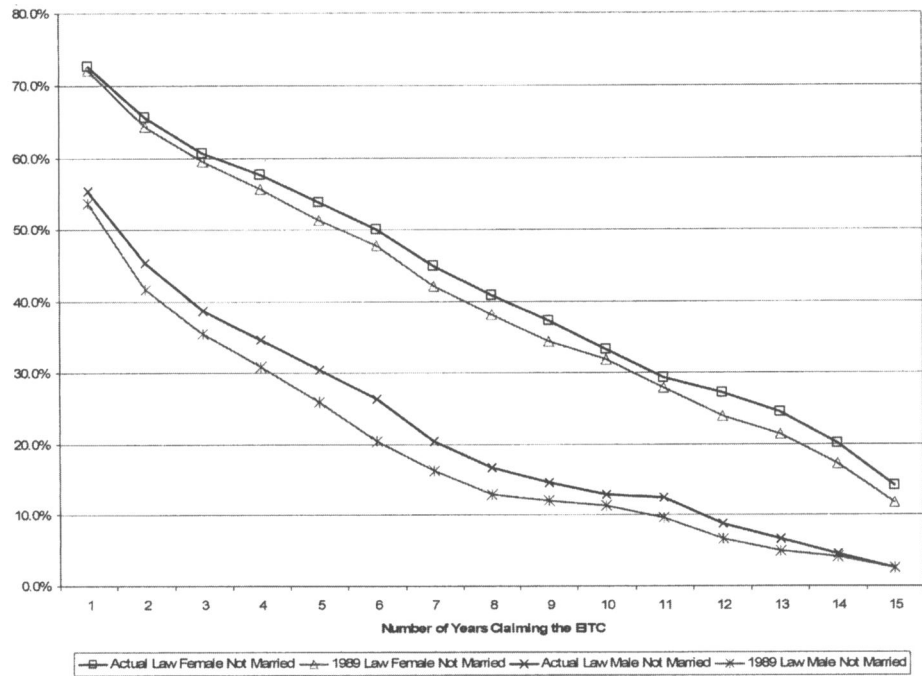


Figure 4b. Cumulative Probability of Claiming the EITC by Gender with Children



namics (PSID) to analyze episodes of EITC usage over the period from 1975–1992, and finds that the majority of people eligible to claim the EITC are only eligible for short periods of time. The data represented in Figure 3 indicates that 41 percent of EITC recipients receive the credit for one or two years, and that 49 percent receive the credit for three or fewer years. Some taxpayers are only observed for a short period of time and, consequently, are not included in the 15-year panel. Because some of these taxpayers are EITC recipients, the results in Figure 3 underestimate the percentage of EITC recipients claiming the credit for short periods. When missing observations are included, 32 percent of taxpayers who claim the credit claim it once, 19 percent claim the credit twice, and only slightly more than eight percent claim the credit more than seven times. Thus, these results are roughly consistent with those of Horowitz.

with children never claim the EITC during the three-year period, and 20 percent claim the EITC in each of the three years. The least likely outcome (1.3 percent probability) is to claim the EITC only in years one and three. This could be the result of increasing income in the second year, with a reversion to mean in the third year, or of a temporary increase in the number of qualifying children in the household. The second least likely outcome (1.7 percent probability) is to claim the EITC only in the second year. These results highlight the fact that there is a considerable amount of persistence in claiming the EITC, as can be seen by the 9.6 percent probability of claiming the credit only in year one. In contrast to the results from Figure 3, Table 2 shows that, at any fixed point in time, most of the taxpayers who receive the EITC are likely to be repeat claimants.

**THREE-YEAR ROLLING PANEL
TRANSITION MATRIX AND
DESCRIPTIVE STATISTICS**

Table 2 shows a transition matrix for the three-year rolling panel. The weighted results indicate that 63 percent of taxpayers

**INITIAL-CLAIMANTS AND ENTRANTS
SAMPLE DESCRIPTIVE STATISTICS**

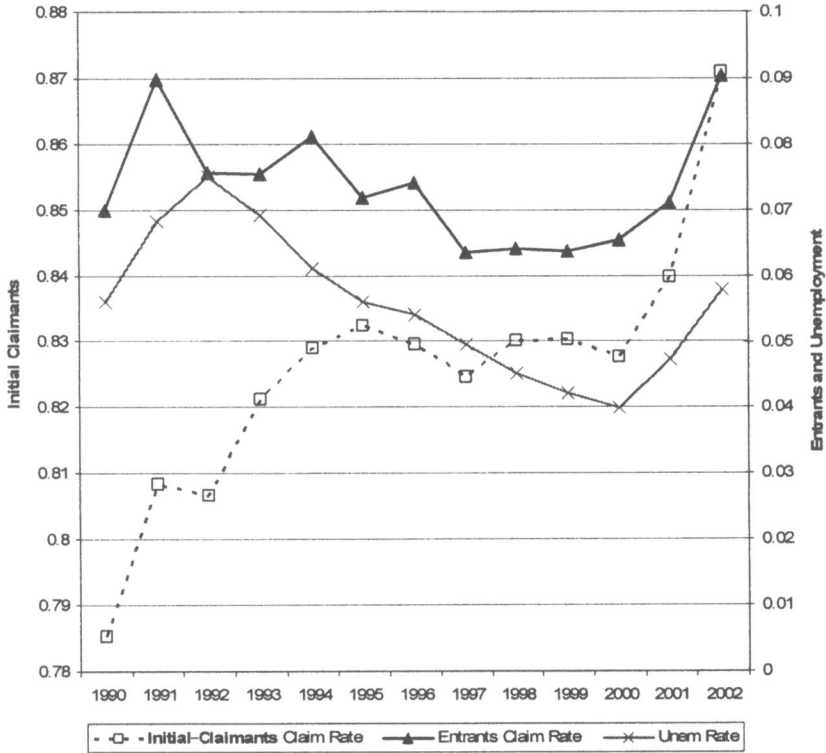
Figure 5 shows the time series of EITC claim rates in the second year of the three-year rolling panel (1990–2002) for those who claimed the credit in year one and are the pool of taxpayers who could

TABLE 2
TRANSITION MATRIX FOR EITC ROLLING THREE-YEAR PANEL, TAXPAYERS WITH CHILDREN

	Unweighted (Counts)			Weighted (Millions)		
	No. Obs.	Percentage of Observations		No. Obs.	Percentage of Observations	
		All	All		EIC only	All
Never claim in three-year period	99,949	62.4		337.9	62.8	
Claim Once	14,045	8.8	23.3	48.3	9.0	24.1
Claim only in 1st year	5517	3.4	9.2	19.2	3.6	9.6
Claim only in 2nd year	2733	1.7	4.5	9.4	1.7	4.7
Claim only in 3rd year	5795	3.6	9.6	19.7	3.7	9.8
Claim Twice	12,819	8.0	21.3	43.1	8.0	21.5
Claim in 1st and 2nd years	4996	3.1	8.3	17.0	3.2	8.5
Claim in 1st and 3rd years	2193	1.4	3.6	7.1	1.3	3.5
Claim in 2nd and 3rd years	5630	3.5	9.4	19.0	3.5	9.5
Claim all three years	33,300	20.8	55.3	109.2	20.3	54.5
Total	160,113	100	100	538	100	100

Note: The weights in the table are the inverse of their sampling rate. For the most part, the weights are constant; however, in 1998 and thereafter the CWS sampling structure changed from sampling two SSN numbers, or a 1 in 5,000 sampling rate, to sampling five SSN numbers, or a 1 in 2,000 sampling rate. Additionally, due to the nature of the rolling panel and the possibility that there are multiple observations for each taxpayer, only 31,870 of the 160,113 observations are independent observations.

Figure 5. Second Year EITC Claim Rates and National Unemployment Rate



be leaving the program (initial-claimants), and those taxpayers who did not claim the credit in the first year and are the pool of taxpayers who could be entering the program (entrants).⁸ Figure 5 also includes a time series of national unemployment rates. The left-hand axis indicates the claim rate in the second year for the initial claimants. The scale on the right hand axis is the claim rate for entrants and the unemployment rate. Figure 5 provides suggestive evidence that there is a correlation between the claim rate and the unemploy-

ment rate for the entrants, but a less strong correlation for the initial claimants. Figure 5 indicates that unemployment spells are more likely to cause a new entrant than to cause someone already claiming the EITC to claim the credit again.

Table 3 shows descriptive statistics for the initial claimants sample based on when and how often the taxpayer claimed the credit. The likelihood of claiming the credit in all three years is positively correlated with being female, and negatively correlated with being married in the first

⁸ Initial claimants are taxpayers who we observe to have claimed the credit in the first year of the three years. These taxpayers could be temporary claimants that are only observed to claim the credit in the first year, or they could be multiple claimants where we observe that they claim the credit in a subsequent year. Entrants are taxpayers who do not claim the EITC in the first year. There are 46,006 observations of three years in the initial-claimants sample. Because some of these taxpayers show up in more than one three-year observation, there are only 13,697 independent observations. Similarly, for the entrants sample, there are 114,107 observations with 25,376 independent observations.

TABLE 3
TAXPAYER DESCRIPTIVE STATISTICS BY CLAIM STATUS, INITIAL-CLAIMANTS SAMPLE (WEIGHTED)

	Claim only in Year 1		Claim only in Years 1 and 2		Claim in all 3 Years		Claim only in Years 1 and 3	
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
Average Age Year 1	61.6	213.8	48.0	145.0	51.2	175.5	50.4	165.9
Percentage Male	0.71	0.45	0.63	0.48	0.42	0.49	0.61	0.49
Avg. First Year of Three Years	1,995.0	3.6	1,995.2	3.6	1,995.5	3.6	1,995.4	3.7
Percentage Married Filing Joint	0.51	0.50	0.43	0.49	0.27	0.45	0.41	0.49
Percentage Head of Household	0.44	0.50	0.53	0.50	0.68	0.47	0.51	0.50
Number of Children Year 1	1.59	0.90	1.58	0.89	1.67	0.94	1.55	0.94
Change in Children Years 2-1	-0.29	0.81	0.01	0.59	0.02	0.62	-0.26	0.81
Change in Children Years 3-2	-0.03	0.64	-0.34	0.81	0.00	0.60	0.27	0.83
Wages and Salaries Year 1	17,624	9,111	15,691	8,339	12,717	7,441	15,902	9,025
Change in Wages Years 2-1	8,413	12,726	1,699	6,324	668	5,310	3,676	9,791
Change in Wages Years 3-2	2,349	10,129	5,523	10,459	376	5,328	-3,539	9,845
EITC Amount Year 1	999	833	1349	920	1,766	1,001	1,201	930
EITC Amount Year 2	0	0	1211	934	1,883	1,013	0	0
EITC Amount Year 3	0	0	0	0	1,896	1,041	1,251	992
State Unemployment Rate Year 1	5.52	1.45	5.54	1.45	5.53	1.45	5.49	1.54
Change in Unem Rate Years 2-1	-0.02	0.80	-0.04	0.82	0.01	0.77	0.02	0.82
Change in Unem Rate Years 3-2	0.00	0.76	-0.04	0.78	0.01	0.76	0.05	0.82
State Avg. Weekly Wage Year 2	623.7	5,701.6	623.3	5,785.6	621.0	5,611.6	623.3	5,579.5
State Avg. Weekly Wage Year 3	630.1	5,732.2	629.2	5,852.5	627.1	5,664.0	628.1	5,630.7
Max EITC Year 1	2,921.3	1,127.9	2,980.1	1,103.7	3,036.8	1,088.7	2,976.8	1,110.8
Max EITC Year 2	3,123.6	1,056.3	3,188.5	1,021.7	3,237.6	998.7	3,174.0	1,027.1
Max EITC Year 3	3,318.2	935.9	3,383.1	891.2	3,424.1	865.7	3,377.9	889.9
Max Welfare Family of 3 Year 1	463.2	204.5	447.6	201.1	425.7	199.4	442.4	202.1
Max Welfare Family of 3 Year 2	432.0	175.9	420.7	177.9	400.9	178.5	413.7	179.0
Max Welfare Family of 3 Year 3	421.0	168.8	411.0	170.3	391.5	171.8	403.4	171.5
Waiver State in Year 1	0.30	0.46	0.29	0.45	0.27	0.45	0.25	0.43
Waiver State in Year 2	0.27	0.44	0.26	0.44	0.25	0.43	0.24	0.43
Waiver State in Year 3	0.24	0.43	0.23	0.42	0.22	0.42	0.23	0.42
TANF State in Year 1	0.37	0.48	0.39	0.49	0.42	0.49	0.43	0.49
TANF State in Year 2	0.47	0.50	0.48	0.50	0.51	0.50	0.50	0.50
TANF State in Year 3	0.55	0.50	0.57	0.50	0.59	0.49	0.57	0.50
Number of Observations (1,000s)	5.5		5.0		33.3		2.2	
Weighted Total (Millions)	19.2		17.0		109.2		7.1	

Note: Samples are conditional on observing all three years for each three-year period from 1989-2003 and at least one child in one of the three years. Income values are real 2000 dollar amounts deflated with the urban consumer price index.

year. Taxpayers claiming the credit all three years have slightly more children in the first year, and have almost \$3,000 less income in wages and salaries than taxpayers who claim the credit in years one and two. These same characteristics make it more likely the taxpayer will obtain a substantially greater EITC. Taxpayers claiming the credit all three years received, on average, a credit worth \$417 more than the average for taxpayers claiming the credit in years one and two, and almost \$800 more than those taxpayers claiming the credit only in the first year.

The results in Table 3 are consistent with those from Horowitz (2002). He finds that 53 percent of families become eligible for the EITC due to a loss of income, while only 12 percent of families become eligible due to the introduction of a child. He also reports that 43 percent of families become ineligible due to increased earnings, and 15 percent become ineligible because the last eligible child is no longer present in the family.

The lower half of Table 3 shows how the economic and policy variables may impact the probability of claiming the EITC.⁹ Tax-

⁹ The state unemployment rates and the state average weekly wage rates are from the U.S. Bureau of Labor Statistics (2005). The maximum EITC benefits are from Table 1. Data for the maximum welfare benefit for a family of three are from the Committee on Ways and Means (U.S. Congress, 1991, 1994, 1996, 1998, 2000, and 2004). Finally, data on when a state implemented a waiver from AFDC or fully implemented TANF are from CEA (1999).

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payers who claimed the credit only in the first year were more likely to be in a state that experienced a decline in the unemployment rate. In contrast, those taxpayers who claimed the credit all three years or in years one and three were more likely to live in a state that experienced an increase in the unemployment rate.

State welfare policy in the form of the maximum monthly welfare benefit for a family of three also appears to be an important correlate. Taxpayers who claimed the credit in all three years were more likely to live in a state that had less generous benefits than taxpayers who claimed the credit only once or twice.

Table 4 shows descriptive statistics for the sample of entrants. Taxpayers who

never claim the EITC are more likely to be married, male, and have substantially more wage and salary income. Interestingly, these taxpayers on average have more children than taxpayers who claim the credit in one or more subsequent years. They are also more likely to experience a reduction in the number of eligible dependent children in the second and third years. Claiming the EITC in year two or three is associated with an average increase in the number of children of between 0.4 and 0.5.

Claiming the credit in year two or three is also associated with a decline in wages and salary. Taxpayers claiming the credit in only the second year experienced a decline in wages of, on average, \$5,780 in the

TABLE 4
TAXPAYER DESCRIPTIVE STATISTICS BY CLAIM STATUS, ENTRANTS SAMPLE (WEIGHTED)

	Never Claim		Claim only in Year 2		Claim only in Years 2 and 3		Claim only in Year 3	
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
Average Age Year 1	45.8	96.0	48.1	149.6	53.8	199.5	36.6	82.2
Percentage Male	0.90	0.30	0.77	0.42	0.64	0.48	0.73	0.45
Avg. First Year of Three Years	1,995.1	3.8	1,994.9	3.8	1,995.0	3.9	1,994.8	4.0
Percentage Married Filing Joint	0.80	0.40	0.51	0.50	0.37	0.48	0.42	0.49
Percentage Head of Household	0.12	0.33	0.20	0.40	0.18	0.38	0.15	0.35
Number of Children Year 1	1.63	1.03	1.18	1.15	0.94	1.17	0.95	1.17
Change in Children Years 2-1	-0.01	0.61	0.37	0.82	0.52	0.84	0.06	0.60
Change in Children Years 3-2	-0.01	0.60	-0.27	0.81	0.05	0.59	0.49	0.82
Wages and Salaries Year 1	66,476	114,036	23,610	16,015	18,158	13,236	23,198	18,095
Change in Wages Years 2-1	1,613	88,329	-5,780	14,692	-3,228	11,243	-1,058	11,683
Change in Wages Years 3-2	761	94,864	7,071	12,914	-65	6,584	-6,117	13,805
EITC Amount Year 1	0	0	0	0	0	0	0	0
EITC Amount Year 2	0	0	943	816	1,358	895	0	0
EITC Amount Year 3	0	0	0	0	1,495	948	1,241	891
State Unemployment Rate Year 1	5.45	1.49	5.54	1.48	5.54	1.51	5.52	1.52
Change in Unem Rate Years 2-1	0.05	0.81	0.09	0.90	0.08	0.85	0.09	0.86
Change in Unem Rate Years 3-2	0.04	0.79	0.03	0.81	0.06	0.81	0.10	0.87
State Avg. Weekly Wage Year 2	634.8	96.6	625.6	94.1	616.3	95.4	619.1	95.2
State Avg. Weekly Wage Year 3	640.9	97.8	630.7	95.2	623.1	98.1	623.9	95.1
Max EITC Year 1	2,897.0	1,137.4	2,819.4	1,150.1	2,827.4	1,148.7	2,776.3	1,163.5
Max EITC Year 2	3,097.9	1,066.2	3,034.7	1,083.3	3,043.4	1,077.2	2,973.2	1,110.7
Max EITC Year 3	3,299.0	943.4	3,241.5	969.8	3,254.4	960.0	3,192.4	995.3
Max Welfare Family of 3 Year 1	483.4	196.7	468.4	207.3	449.6	203.6	471.7	215.9
Max Welfare Family of 3 Year 2	454.5	173.4	439.4	183.5	419.7	181.3	431.2	181.3
Max Welfare Family of 3 Year 3	443.2	166.7	425.6	173.4	408.9	173.5	420.7	174.4
Waiver State in Year 1	0.28	0.45	0.26	0.44	0.26	0.44	0.25	0.44
Waiver State in Year 2	0.26	0.44	0.27	0.44	0.25	0.43	0.25	0.43
Waiver State in Year 3	0.24	0.43	0.25	0.43	0.23	0.42	0.24	0.43
TANF State in Year 1	0.39	0.49	0.36	0.48	0.38	0.48	0.38	0.48
TANF State in Year 2	0.47	0.50	0.44	0.50	0.44	0.50	0.43	0.50
TANF State in Year 3	0.54	0.50	0.51	0.50	0.52	0.50	0.50	0.50
Number of Observations (1,000s)	99.9		2.7		5.6		5.8	
Weighted Total (Millions)	337.9		9.4		19.0		19.7	

Note: Samples are conditional on observing all three years for each three-year period from 1989-2003 and at least one child in one of the three years. Income values are real 2000 dollar amounts deflated with the urban consumer price index.

second year while taxpayers who claimed the credit in only the third year experienced a slight decline in the second year and a significant decline of \$6,117 in the third year. These taxpayers experienced substantial shocks in their wage income of, on average, about a quarter of their first year wage income. For these taxpayers, the EITC made up about a one-sixth of the decline in their wage income.

The lower half of Table 4 also shows the association between economic and policy variables and the probability that a taxpayer claims the credit. Reflecting the lagged effect of unemployment rates on the economy, taxpayers who claimed the credit in only the third year lived in a state that experienced an increase in the unemployment rate in year two from, on average, 5.52 percent to 5.61 percent. But, the largest increase in the unemployment rate—to 5.72 percent—occurred for those taxpayers in the third year of the three-year rolling panel. Given that the EITC was enacted to provide assistance during the 1974–1975 recession, the EITC appears to be meeting one of its intended goals: mitigating the effects of downturns. These results are roughly consistent with those of Auerbach and Feenberg (2000) who find that the EITC acts cyclically for the first quintile—i.e., when the economy increases income in the first quintile the effect of the EITC is to increase income in the first quintile—and counter-cyclically for the second and third quintiles, but has no effect for the fourth and fifth quintiles. Their results suggest that the EITC acts as a safety net for taxpayers in the second and third quintile.

Taxpayers who never claim the credit are more likely to be in a state that has a higher real value of the average weekly wage rate in years two and three.¹⁰ The state average weekly wage rate conveys information about the labor market for those who are working. The higher is the

state weekly wage rate, the more likely it is that the taxpayer would be phased out of the EITC. Those who never claim the credit live in states with a real average wage rate of, on average, \$635 in the second year. Taxpayers who claim the credit three times (Table 3, initial claimants sample) live in states with an average weekly wage rate of \$620.

Several studies have found evidence that the EITC reduced overall welfare participation (Grogger, 2003) and that the EITC had a negative impact on initial entry and re-entry on welfare (Grogger, 2004). Tables 3 and 4 provide preliminary evidence that living in a generous welfare state, as measured by the maximum monthly welfare benefit for a family of three, is associated with a lower probability of claiming the EITC. Taxpayers never claiming the credit live in states with, on average, a \$57.70 higher maximum monthly welfare benefit in year one than taxpayers who claim the credit all three years (see the initial-claimants sample in Table 3).

Substantial changes to welfare policy during the 1990s may have also had an impact on EITC usage. Between 1993 and 1998, a number of states were granted waivers from the Federal AFDC program to implement their own welfare reform. Moreover, the Federal overhaul of the AFDC program resulting in TANF was implemented by states over the course of several years from 1996 to 1998. Serving as laboratories for welfare reform, many of the states that received welfare waivers implemented work requirements and time limits, among other reforms. Work requirements and time limits are the most likely policy changes to impact the probability of claiming the EITC.

Tables 3 and 4 show the percentage of observations in a waiver state or a TANF state based upon EITC claim status. The waiver variable is a dummy variable equal to one

¹⁰ Due to difficulties in obtaining state weekly wage rates for 1989, year one is not included in the analysis.

from the time of officially implementing the waiver until the implementation of TANF in the state. The TANF variable is a dummy variable equal to one from the time of officially implementing TANF through 2003. These state- and time-specific changes in the rules governing welfare benefits provide potential variation across states and time that may shed light on the impact of welfare reform on EITC usage.

A priori, we expect that living in a waiver state and living in a TANF state would be positively correlated with the probability of claiming the EITC. Table 3 shows counter-intuitive results for the waiver state dummy, suggesting that living in a waiver state reduces the likelihood of claiming the credit. It also suggests that living in a state that implemented TANF is correlated with the probability that taxpayers claim the credit all three years. Table 4 provides preliminary analysis that there is little evidence that living in a waiver state or living in a TANF state is positively correlated with the probability of claiming the EITC for the entrants sample.

THREE-YEAR ROLLING PANEL PROBIT REGRESSION RESULTS

The previous tables indicate that there are potentially important differences between those taxpayers who claim the credit temporarily and those taxpayers who claim the credit multiple times. The tables also suggest that the EITC acts to mitigate the effects of downturns in the economy, and is responsive to changes in some welfare policies. In order to investigate these issues more thoroughly, the following analysis presents a multivariate probit that analyses the probability of claiming the EITC in the second and third years of the three-year period. The reduced form model is of the following form:

$$[1] \text{ Claim}_{t+1} = X_t * B_x + Y_t * B_y + Z_{t+1} * B_z + \epsilon_{t+1};$$

$$[2] \text{ Claim}_{t+2} = \text{Claim}_{t+1} * B_{C,t+1} + X_t * B_x + Y_t * B_y + Z_{t+1} * B_z + X_{t+1} * B_3 + \epsilon_{t+2};$$

where t indicates the time period, $Claim$ is the zero-one indicator for the taxpayer's EITC claim status, X is a set of demographic variables, Y is a set of individual-specific income variables, and Z is the set of economic and policy variables from Table 4.

Tables 5 and 6 show the results of a probit analysis of the probability of claiming the EITC for the initial-claimants and entrants samples. In each table, columns 1-3 report estimates for the probability of claiming the credit in the second year of the three-year rolling panel. Columns 4-6 report estimates for the probability of claiming the EITC in the third year of three-year rolling panel. The standard errors are corrected to account for multiple observations for taxpayers. The second and fifth columns present the marginal effects of the independent variables on the probability of claiming the EITC evaluated at the mean of the independent variables for the probits without state fixed effects.¹¹ When state fixed effects are included, the constant term represents female primary taxpayers living in New York, who are between the ages of 20 and 29, inclusive. All of the probit regressions also included first year values of the following income variables: dividends, interest, pension income, schedule C income, and schedule E income.¹²

The probit regression for the initial-claimants sample shown in Table 5 are evaluated at the means of the independent variables for the initial-claimants sample, which corresponds with a probability of claiming the EITC of 87 percent in year

¹¹ Dummy variable marginal effects are analyzed as discrete changes from a value of zero to a value of one.

¹² These additional income variables generally had a negative and significant impact on the probability of claiming the EITC.

TABLE 5
PROBIT RESULTS, INITIAL CLAIMANTS SAMPLE

	Claim EITC in Year 2			Claim EITC in Year 3			Mean
	Coef.	dy/dx	Coef.	Coef.	dy/dx	Coef.	
Claim in Yr 2				1.54620*** (0.02225)	0.52603 (0.00758)	1.54018*** (0.02224)	0.828
Male	-0.41889*** (0.02467)	-0.09115 (0.00547)	-0.42572*** (0.02473)	-0.36344*** (0.02253)	-0.09680 (0.00605)	-0.36986*** (0.02257)	0.491
Married Joint Yr 1	-0.21949*** (0.02692)	-0.04950 (0.00631)	-0.22102*** (0.02704)	-0.15555*** (0.02518)	-0.04234 (0.00700)	-0.15290*** (0.02529)	0.328
No. of Children Yr 1	0.28683*** (0.01463)	0.06207 (0.00303)	0.28945*** (0.01463)	0.22963*** (0.01316)	0.06105 (0.00340)	0.23069*** (0.01321)	1.65
Change # Child Yr 2	0.49544*** (0.01903)	0.10721 (0.00388)	0.49857*** (0.01905)	0.24218*** (0.01584)	0.06439 (0.00413)	0.24448*** (0.01590)	-0.03
Change # Child Yr 3				0.48509*** (0.01771)	0.12897 (0.00453)	0.48784*** (0.01776)	-0.03
Have Wages Yr 1	0.36191*** (0.05874)	0.09217 (0.01719)	0.36622*** (0.05816)	0.26529*** (0.05143)	0.07774 (0.01640)	0.26870*** (0.05138)	0.940
Wages Yr 1	-0.00005*** (0.00000)	-0.00001 (0.00000)	-0.00005*** (0.00000)	-0.00003*** (0.00000)	-0.00001 (0.00000)	-0.00003*** (0.00000)	13,814.6
Teenager in Yr 1	-0.26570*** (0.07406)	-0.06577 (0.02061)	-0.27156*** (0.07410)	-0.12179* (0.06811)	-0.03409 (0.02000)	-0.12562* (0.06845)	0.014
Thirty in Yr 1	-0.01714 (0.02267)	-0.00372 (0.00493)	-0.01875 (0.02282)	0.00577 (0.02176)	0.00153 (0.00578)	0.00381 (0.02186)	0.378
Forty in Yr 1	-0.14008*** (0.02635)	-0.03167 (0.00624)	-0.14561*** (0.02638)	-0.11190*** (0.02509)	-0.03060 (0.00706)	-0.11501*** (0.02516)	0.213
Fifty in Yr 1	-0.06838* (0.03794)	-0.01527 (0.00875)	-0.07187* (0.03796)	-0.05307 (0.03488)	-0.01440 (0.00965)	-0.05678 (0.03495)	0.075
Sixty in Yr 1	-0.18635*** (0.06405)	-0.04423 (0.01661)	-0.18971*** (0.06363)	-0.12563** (0.05169)	-0.03515 (0.01518)	-0.12776** (0.05157)	0.033
State Unem Rate Yr 1	0.05443*** (0.00907)	0.01178 (0.00196)	0.04295*** (0.01268)	0.06186*** (0.00960)	0.01645 (0.00255)	0.06691*** (0.01542)	5.525
Change in Unem Yr 2	0.07438*** (0.01290)	0.01610 (0.00280)	0.05964*** (0.01335)	0.08910*** (0.01340)	0.02369 (0.00357)	0.08944*** (0.01349)	-0.0029
Change in Unem Yr 3				0.08380*** (0.01403)	0.02228 (0.00374)	0.08627*** (0.01605)	0.00330
Weekly Wage in Yr	-0.00017 (0.00013)	-0.00004 (0.00003)	0.00027 (0.00028)	-0.00012 (0.00012)	-0.00003 (0.00003)	-0.00011 (0.00027)	621.70 627.78
Max EITC Benefit in Yr	0.00007*** (0.00002)	0.00002 (0.00000)	0.00008*** (0.00002)	0.00008*** (0.00002)	0.00002 (0.00001)	0.00009*** (0.00002)	3,214.79 3,404.08
Max Welfare Benefit Yr	-0.00044*** (0.00007)	-0.00010 (0.00002)	-0.00001 (0.00021)	-0.00048*** (0.00007)	-0.00013 (0.00002)	-0.00036** (0.00018)	407.60 397.93
Waiver State in Yr	-0.00999 (0.03266)	-0.00217 (0.00711)	-0.03118 (0.03479)	0.00598 (0.03352)	0.00159 (0.00889)	-0.01049 (0.03598)	0.25 0.23
TANF State in Yr	-0.00416 (0.04013)	-0.00090 (0.00868)	-0.03595 (0.04493)	-0.00705 (0.04318)	-0.00187 (0.01147)	-0.00392 (0.04887)	0.50 0.58
_cons	1.15257*** (0.10683)		0.28800** (0.13486)	-0.57967*** (0.10419)		-0.65080** (0.25604)	
State Fixed Effects	No	No	Yes	No	No	Yes	

Note: Standard Errors are in parentheses and are adjusted to account for potential correlation due to multiple observations for each taxpayer. * indicates significant at the 10% level, ** indicates significant at the 5% level, and *** indicates significant at the 1% level. Dollar variables are real 2000 dollars. For current year mean values, first number is year 2, second number is year 3.

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TABLE 6
PROBIT RESULTS, ENTRANTS SAMPLE

	Claim EITC in Year 2			Claim EITC in Year 3			Mean
	Coef.	dy/dx	Coef.	Coef.	dy/dx	Coef.	
Claim in Yr 2				1.45744*** (0.02264)	0.16132 (0.01031)	1.45153*** (0.02260)	0.074
Male	-0.31271*** (0.02225)	-0.00341 (0.00052)	-0.31271*** (0.02216)	-0.23491*** (0.02194)	-0.00805 (0.00106)	-0.23589*** (0.02196)	0.874
Married Joint Yr 1	0.07715*** (0.02327)	0.00056 (0.00016)	0.07378** (0.02326)	-0.01366 (0.02146)	-0.00038 (0.00062)	-0.01857 (0.02158)	0.752
No. of Children Yr 1	0.11163*** (0.01177)	0.00086 (0.00012)	0.11423*** (0.01153)	0.04238*** (0.00945)	0.00118 (0.00026)	0.04351*** (0.00945)	1.55
Change # Child Yr 2	0.37603*** (0.01597)	0.00290 (0.00038)	0.37627*** (0.01591)	0.07219*** (0.01320)	0.00201 (0.00040)	0.07143*** (0.01322)	0.03
Change # Child Yr 3				0.34776*** (0.01522)	0.00968 (0.00083)	0.34690*** (0.01523)	0.01
Have Wages Yr 1	0.73842*** (0.04790)	0.00249 (0.00034)	0.73749*** (0.04718)	0.55711*** (0.04429)	0.00888 (0.00073)	0.55818*** (0.04381)	0.962
Wages Yr 1	-0.00004*** (0.00000)	-0.00000 (0.00000)	-0.00004*** (0.00000)	-0.00003*** (0.00000)	-0.00000 (0.00000)	-0.00003*** (0.00000)	60,848.7
Teenager in Yr 1	-0.22861*** (0.03626)	-0.00130 (0.00019)	-0.22839*** (0.03630)	0.73070*** (0.05717)	0.04620 (0.00759)	0.73805*** (0.05703)	0.011
Thirty in Yr 1	-0.12925*** (0.02235)	-0.00094 (0.00021)	-0.13019*** (0.02235)	-0.20465*** (0.02112)	-0.00533 (0.00070)	-0.20697*** (0.02112)	0.342
Forty in Yr 1	-0.18343*** (0.02552)	-0.00131 (0.00026)	-0.18477*** (0.02539)	-0.25437*** (0.02392)	-0.00653 (0.00081)	-0.25878*** (0.02395)	0.342
Fifty in Yr 1	-0.29258*** (0.03511)	-0.00170 (0.00028)	-0.29652*** (0.03523)	-0.33624*** (0.03208)	-0.00716 (0.00077)	-0.33894*** (0.03221)	0.134
Sixty in Yr 1	-0.50854*** (0.06262)	-0.00214 (0.00032)	-0.51261*** (0.06176)	-0.47096*** (0.05489)	-0.00812 (0.00087)	-0.47573*** (0.05435)	0.036
State Unem Rate Yr 1	0.03625*** (0.00795)	0.00028 (0.00007)	0.02530** (0.01088)	0.05764*** (0.00858)	0.00160 (0.00028)	0.05035*** (0.01458)	5.458
Change in Unem Yr 2	0.09270*** (0.01143)	0.00071 (0.00013)	0.07987* (0.01171)	0.06544*** (0.01192)	0.00182 (0.00035)	0.06262*** (0.01197)	0.05120
Change in Unem Yr 3				0.10151*** (0.01334)	0.00283 (0.00044)	0.09564*** (0.01564)	0.04415
Weekly Wage in Yr	-0.00004 (0.00012)	-0.00000 (0.00000)	-0.00011 (0.00026)	-0.00028** (0.00011)	-0.00001 (0.00000)	-0.00015 (0.00025)	632.82 638.93
Max EITC Benefit in Yr	0.00004*** (0.00001)	0.00000 (0.00000)	0.00005*** (0.00002)	0.00003* (0.00002)	-0.00000 (0.00000)	0.00003* (0.00002)	3,087.32 3,289.95
Max Welfare Benefit Yr	-0.00034*** (0.00007)	-0.00000 (0.00000)	0.00016 (0.00020)	-0.00028*** (0.00006)	-0.00001 (0.00000)	-0.00033* (0.00018)	451.22 439.95
Waiver State in Yr	-0.00691 (0.02761)	-0.00005 (0.00021)	-0.01467 (0.03113)	-0.02175 (0.02937)	-0.00060 (0.00080)	-0.05074 (0.03258)	0.25 0.24
TANF State in Yr	-0.06683* (0.03568)	-0.00051 (0.00028)	-0.06148 (0.04022)	-0.03712 (0.03842)	-0.00104 (0.00108)	-0.07315* (0.04441)	0.46 0.54
_cons	-0.58522*** (0.09221)		0.30273** (0.13487)	-0.75682*** (0.09380)		-0.66733** (0.26167)	
State Fixed Effects	No	No	Yes	No	No	Yes	

Note: Standard Errors are in parentheses and are adjusted to account for potential correlation due to multiple observations for each taxpayer. * indicates significant at the 10% level, ** indicates significant at the 5% level, and *** indicates significant at the 1% level. Dollar variables are real 2000 dollars. For current year mean values, first number is year 2, second number is year 3.

two and 82 percent in year three. Similarly, the probit regression for the entrants sample shown in Table 6 are evaluated at the means of the independent variables for the entrants sample, which corresponds with a probability of claiming the EITC of 0.25 percent for year two and 1.05 percent for year three.

Concentrating on the marginal-effects columns, Table 5 provides additional evidence that there appears to be considerable persistence in claiming the credit. Eighty-three percent of the taxpayers in the initial-claimants sample claimed the EITC in year two. Moreover, claiming the credit in year two increased the probability of claiming the credit in year three by 53 percent.

Table 5 also suggests that that being male, being married, and the amount of wage income all have negative effects on the probability of claiming the EITC in both years two and three. The number of eligible children in year one and the change in the number of eligible children in the household have a positive effect for both years, with the largest effect occurring for the change in the number of eligible children in the reference year. The results suggest that the addition of another child to the family in year two would result in an 11 percentage point increase in the probability of claiming the EITC in year two, and the addition of a child in year three would increase the probability by 13 percentage points.

The dummy variable for the presence of wages attempts to capture the non-linear and dependent nature of the EITC on earned income.¹³ The results show that the presence of wages is positively associated with the probability of claiming the credit.

The bottom half of Tables 5 and 6 shows the effects of the economic and policy variables. The results in Table 5 suggest that the EITC acts counter-cyclically; the unemployment rate in the first year and the change in the unemployment rate in years two and three are positively and significantly correlated with the probability of claiming the credit. With a full percentage point increase in the unemployment rate, the marginal effect of an increase in the unemployment rate varies from an increase of one percentage point in the probability of claiming the credit to an increase of 2.4 percentage points.

The results for the welfare policy variables are mixed for the initial-claimants sample. The real maximum welfare benefit appears to be negatively correlated to the probability of claiming the credit. Living in a state that provides relatively generous welfare benefits appears to decrease the probability of claiming the credit. In 2000, Alabama had the lowest maximum welfare benefit for a family of three (\$164), and Alaska had the highest benefit (\$923). Being in a state that provided a benefit of \$923 relative to a state that provided \$164 would be associated with a reduction in the probability of claiming the EITC by 7.6 percentage points in year two and by 9.9 percentage points in year three. Finally, the effect of living in a waiver state or living in a TANF state is statistically insignificant and mostly has the wrong sign. This differs from the results of Hotz, Mullin, and Scholz (2005). In their study, they use the proportion of welfare recipients enrolled in a Welfare-to-Work program, whereas these results use whether a state had implemented a reform. One potential area of future research would be to include a more detailed welfare reform variable capturing the different types of reform.

¹³ Taxpayers are eligible for the EITC if they have earned income. Prior to 2002, earned income was defined as the combination of wages and net self-employment income (schedule-C income) as well as any other employee compensation.

Table 5 also shows that the real value of the maximum EITC benefit in the reference year is positively correlated with the probability of claiming the credit. The change in the maximum value of the credit between 1993 and 1994 (see Table 1) was \$604 for one child and \$1,017 for two or more children. The results in Table 5 suggest that a real \$600 increase in the maximum benefit of the EITC would increase the probability of claiming the credit by 1.2 percentage points, and a \$1,000 increase would increase the probability of claiming the credit by two percentage points for both years.

As can be seen in columns 3 and 6, the addition of the state fixed effects has little impact on the demographic and taxpayer-specific-income variables. But, not unexpectedly, the addition of state fixed effects generally reduces the coefficient and significance of the state economic and policy variables that vary only by state.

Table 6 presents the probit analysis for the entrants sample, i.e., those who have children and did not claim the credit in year one. There are some notable differences in the results compared with those in Table 5. First, while being a male primary taxpayer still reduces the probability of claiming the credit, now it reduces it by 0.3 and 0.8 percentage points for years two and three, respectively, when evaluated at the means for the entrants sample. Being married increases, instead of decreases, the probability of claiming the credit in year two, but is statistically insignificant in year three.

For the economic and policy variables, while the unemployment rate and the change in the unemployment rate are still positively and significantly associated with the probability of claiming the credit, the marginal effects are a one-tenth or less of those for the initial claimants sample. Finally, the welfare variables follow the same general pattern as the initial-claimants results and have smaller marginal effects.

MARGINAL EFFECTS ANALYSIS

Probit regressions and their marginal effects are non-linear and, as a result, the marginal effects can be substantially different depending on the values of the independent variables at which they are evaluated. Therefore, the differences in marginal effects between the two regressions could be the result of inherently different responses or the different attributes of the two samples. In order to explore these issues, Table 7 presents the marginal effects for both regressions evaluated at the mean value of the independent variables from the initial-claimants sample. Table 7 shows that while much of the difference in the marginal effects can be attributed to differences in the mean values at which they are evaluated, there are still interesting differences between the two regression results. The results from the initial-claimants regression indicate that being married would reduce the probability of claiming the credit in the second year by five percentage points, but the entrants regressions suggest that married taxpayers are three percentage points more likely to claim the credit. This suggests that married taxpayers are more likely to claim the credit on a temporary basis.

The initial number of children increases the probability of claiming the credit in both year two and year three by six percentage points for the initial-claimants regressions, but by four and 1.5 percentage points for the entrants regressions. However, the change in the number of children from year one to year two appears to be more important for the entrants sample than for the initial-claimants sample. An increase of one child in year two would increase the probability by 13.5 percentage points in year two for the entrants regressions, compared with almost 11 percentage points for the initial-claimants regression. These results may not so much be a

TABLE 7
MARGINAL EFFECTS EVALUATED AT INITIAL-CLAIMANTS INDEPENDENT VARIABLE MEANS

	Claim in Year 2				Claim in Year 3			
	Initial Claimants		Entrants		Initial Claimants		Entrants	
	dy/dx	Std Err	dy/dx	Std Err	dy/dx	Std Err	dy/dx	Std Err
Claim in Yr 2					0.526033	-0.00758	0.533525	-0.00693
Male	-0.09115	(0.00547)	-0.11192	(0.00811)	-0.09680	(0.00605)	-0.08496	(0.00782)
Married Joint Yr 1	-0.04950	(0.00631)	0.02789	(0.00848)	-0.04234	(0.00700)	-0.00495	(0.00779)
No. of Children Yr 1	0.06207	(0.00303)	0.04013	(0.00442)	0.06105	(0.00340)	0.01534	(0.00339)
Delta No. Children 2	0.10721	(0.00388)	0.13518	(0.00573)	0.06439	(0.00413)	0.02614	(0.00482)
Delta No. Children 3					0.12897	(0.00453)	0.12590	(0.00570)
Have Wages Yr 1	0.09217	(0.01719)	0.21517	(0.01132)	0.07774	(0.01640)	0.21537	(0.01737)
Wages Yr 1	-0.00001	(0.00000)	-0.00002	(0.00000)	-0.00001	(0.00000)	-0.00001	(0.00000)
Teenager in Yr 1	-0.06577	(0.02061)	-0.07753	(0.01184)	-0.03409	(0.02000)	0.21061	(0.01244)
Thirty in Yr 1	-0.00372	(0.00493)	-0.04610	(0.00786)	0.00153	(0.00578)	-0.07478	(0.00783)
Forty in Yr 1	-0.03167	(0.00624)	-0.06422	(0.00862)	-0.03060	(0.00706)	-0.09463	(0.00913)
Fifty in Yr 1	-0.01527	(0.00875)	-0.09839	(0.01088)	-0.01440	(0.00965)	-0.12777	(0.01262)
Sixty in Yr 1	-0.04423	(0.01661)	-0.15860	(0.01601)	-0.03515	(0.01518)	-0.18176	(0.02191)
State Unem Rate 1	0.01178	(0.00196)	0.01303	(0.00285)	0.01645	(0.00255)	0.02087	(0.00311)
Delta Unem Rate 2	0.01610	(0.00280)	0.03333	(0.00410)	0.02369	(0.00357)	0.02369	(0.00433)
Delta Unem Rate 3					0.02228	(0.00374)	0.03675	(0.00486)
Weekly Wage in Yr	-0.00004	(0.00003)	-0.00002	(0.00004)	-0.00003	(0.00003)	-0.00010	(0.00004)
Max EITC Benefit	0.00002	(0.00000)	0.00001	(0.00001)	0.00002	(0.00001)	0.00001	(0.00001)
Max Welfare Benefit	-0.00010	(0.00002)	-0.00012	(0.00002)	-0.00013	(0.00002)	-0.00010	(0.00002)
Waiver State in Yr	-0.00217	(0.00711)	-0.00248	(0.00991)	0.00159	(0.00889)	-0.00789	(0.01068)
TANF State in Yr	-0.00090	(0.00868)	-0.02402	(0.01283)	-0.00187	(0.01147)	-0.01342	(0.01387)

Note: Standard Errors are adjusted to account for potential correlation due to multiple observations for the same taxpayer. Marginal effects are evaluated at the means of the independent variables from the initial-claimants sample for both the initial-claimants and the entrants probits.

reflection of whether a taxpayer claims the credit temporarily, but rather an indicator that with the three-year rolling panel, we may be observing the first of many times a taxpayer claims the credit.

The presence of wages increases the probability of claiming the credit by nine and eight percentage points for the initial-claimants regressions in years two and three, respectively, while it increases the probability by almost 22 percentage points for the entrants regressions. Again, this largely reflects the structure of the EITC, which requires the presence of earned income of which wages are the largest part.

Finally, the effects for the entrants-sample regressions of the unemployment rate variables are larger by almost a factor of two. These results suggest that the unemployment rate plays a more significant role in determining claim status for taxpayers who claim the credit on a more temporary basis than for those who claim it more permanently.

The lack of significant differences for the state welfare policies between the two

samples suggests that these policy levers have little differential impact on those who claim the credit on a temporary basis versus those who claim the credit on a more permanent basis. Most states do not change their maximum benefit very often, so, practically speaking, the only source of within-state variation is inflation. Moreover, the maximum welfare benefit variable is a very crude measure and does not necessarily reflect the welfare benefit that the taxpayer would otherwise face. A more individual-specific proxy for welfare benefits is necessary to provide a more thorough analysis of the effects of changes in welfare benefits on EITC usage.

CONCLUSION

In this paper, I took a first look at utilization of the EITC over time using a unique panel data set of taxpayers. I analyzed the panel data set using two different approaches. First, taxpayers who were observed in all 15 years were used to determine the utilization of the EITC

over time. Second, in order to maintain the wealth of information available for those taxpayers who are not observed in all 15 years, I analyzed EITC usage over a shorter, three-year rolling panel.

One of the more interesting results from the 15-year analysis was that a significant portion of taxpayers who claim the credit only claim it once or twice. However, the three-year rolling panel analysis also found that over the three-year period, 55 percent of the taxpayers who claimed the credit claimed it for at least three years. Moreover, summary statistics analysis of the three-year rolling panel showed that taxpayers claiming the credit on a temporary basis experienced fairly sizable shocks to their wage income, suggesting that the EITC does act as a safety net for temporary shocks to income.

This paper also analyzed the dynamics of EITC usage with a multivariate analysis of the probability of claiming the credit in either year two or year three of the three-year rolling panel. The results from the probit analysis suggest that the state of the economy has a significant impact on the probability of claiming the credit.

I provided a preliminary look at the effect of welfare policy variables on the probability of claiming the credit. For the most part, the results of the welfare reform variables were insignificant. However, the generosity of state welfare benefits measured as the maximum welfare benefit for a family of three was found to be negatively and significantly related to the probability of claiming the credit.

This analysis was designed to provide a summary picture of EITC usage over time and the effects of the economy and welfare policy with this data set, and glossed over some important modeling issues. Most prominent among those is the effect of attrition on the results. While attrition from the three-year rolling panel was only four percent, some of the attrition from the sample could be related to the variables of interest. In particular, the EITC has been shown

to induce some people to file tax returns, and the receipt of welfare benefits could be related to filing a tax return, a relationship that may have changed over the period of analysis. An area of future work would be to model the attrition in the sample explicitly, either as a nested probability model or as a sample selection model.

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