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### Labor Market Implications on the Uptake of the Earned Income Tax Credit in New Mexico post Great Recession: 2008-2015

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This thesis is approved, and it is acceptable in quality  
and form for publication

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**LABOR MARKET IMPLICATIONS ON THE UPTAKE OF  
THE EARNED INCOME TAX CREDIT IN NEW MEXICO  
POST GREAT RECESSION: 2008-2015**

**BY**

**JAMES KAMINSKY**

**B.S. LABOR ECONOMICS, UNIVERSITY OF AKRON, 2002  
MBA, FINANCE, UNIVERSITY OF AKRON, 2004**

**THESIS**

Submitted in Partial Fulfillment of the Requirements  
for the Degree of

**Master of Arts**

**Economics**

The University of New Mexico  
Albuquerque, New Mexico

May, 2020

**LABOR MARKET IMPLICATIONS ON THE UPTAKE OF  
THE EARNED INCOME TAX CREDIT IN NEW MEXICO  
POST GREAT RECESSION: 2008-2015**

by

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**ABSTRACT**

The Earned Income Tax Credit (EITC) is one of the most successful poverty alleviation programs in the US tax code. In New Mexico tax filers may apply for a refundable credit – the Working Family Tax Credit (WFTC) – that is predicated upon receipt of the EITC on their federal return. However, the preponderance of research examining the efficacy of the EITC is premised upon two hypotheses: economic conditions are expanding and those seeking work can find it.

Subsequent to the Great Recession, it is not clear that these hypotheses hold. The Great Recession began in Q4-2007 and continued into Q3-2009. During that period, the US unemployment rate grew from 5.1% to 9.7%; the rate peaked during Q4-2009 at 10.09%. During the same period in New Mexico, unemployment grew from 3.8% to 7.9%; New Mexico's unemployment rate peaked later, during Q2-2010 at 8.3%.

This paper endeavors to understand how inefficiencies in the labor market affect EITC uptake, and what traits are indicative of low-income tax filers who do not receive the EITC. Using eight years of New Mexico tax data from 2008-2015, I examine changes in EITC uptake through uptake of New Mexico's WFTC. There is a risk that individuals who face the greatest barriers to labor market participation suffer double jeopardy: they are unable to earn a living, and they risk losing public assistance if the situation persists for too long. Thus, a policy question to consider is what type of investment will create jobs for those who want to work but cannot find it.

# Table of Contents

LIST OF FIGURES.....	v
LIST OF TABLES .....	vi
1. INTRODUCTION.....	1
2. EITC BACKGROUND AND LITERATURE REVIEW .....	4
2.1 The Earned Income Tax Credit & The Working Family Tax Credit.....	4
2.2 Efficacy of the Earned Income Tax Credit.....	9
2.3 The EITC and New Mexico Labor Market .....	11
3. DATA.....	13
3.1 New Mexico Taxpayer Data .....	13
3.2 Eligibility Criteria of the Earned Income Tax Credit .....	16
3.3 Variables.....	18
3.4 Research Groups .....	20
3.5 Summary Statistics.....	23
3.6 Graphical Analysis of Variables .....	27
4. EMPIRICAL MODELS .....	37
5. CONCLUSIONS .....	45
REFERENCES.....	48

## LIST OF FIGURES

Figure 1 - EITC Parameters for tax year 2018.....	6
Figure 2 - US & NM Unemployment Rates, FRED.....	12
Figure 3 - Evidence of Omitted Information.....	22
Figure 4 - Proportion of Filers by Sub-Group.....	27
Figure 5 - Proportion of Recipients.....	28
Figure 6 - Proportion of Benefactives.....	29
Figure 7 - Omitted Information Evidence - Benefactives.....	29
Figure 8 - Proportion of Skeptics.....	31
Figure 9 - Proportion of Ascendants.....	32
Figure 10 - Behavior of Married Filing Jointly Over Time.....	32
Figure 11 - Mean of Federal Adjusted Gross Income Over Time.....	33
Figure 12 - Employment Implications over Time.....	34
Figure 13 - Unemployment Over Time.....	35
Figure 14 - Qualifying Dependents.....	44
Figure 15 - Total Qualifying Dependents.....	44

## LIST OF TABLES

Table 1 - EITC income thresholds by filing status and dependents .....	7
Table 2 - Maximum Benefit of EITC.....	7
Table 3 - Full Panel Summary Statistics .....	25
Table 4 - Summary Statistics of Sub-Groups .....	26

## 1. INTRODUCTION

The Earned Income Tax Credit (EITC) is one of the most successful poverty alleviation programs in the US tax code. It is a refundable tax credit that is paid to tax filers if they have earned income in the tax year; the recipient files a tax return; and the recipient applies for the credit. It is particularly generous for households with children; the amount of the benefit is predicated upon the recipient's income and number of children. In 2015 the program reached over 27 million households and provided over \$67 billion in tax credits (IRS Statistics for Tax Returns, 2016). In another study the EITC is responsible for significantly lowering the poverty rate of its recipients, from 57% to 49%, and for households below the poverty line, the EITC fills 31% of the gap between their household federal adjusted gross income and the poverty line (Simpson, Tiefenthaler, and Hyde 2009).

In New Mexico tax filers may apply for a refundable credit – the Working Family Tax Credit (WFTC) – that is predicated upon receipt of the EITC on their federal return. The IRS estimates that the total value of the EITC in 2015 in New Mexico was approximately \$515 million. In the same tax year, the WFTC was received by over 212 thousand New Mexico tax filers with an expenditure of approximately \$52.3 million. However, the preponderance of research examining the efficacy of the EITC is premised upon two assumptions: economic conditions are expanding and those seeking work can find it. Subsequent to the Great Recession, it is not clear that these hypotheses hold. If these hypotheses are not true, then there exists an important subset of people who would benefit from the EITC but for their inability to document earned income. That is, this group is willing, able, and desirous of work, but they are unable to find it. Moreover, it becomes important to understand the barriers to finding work for this group.



The Great Recession began in Q4-2007 and continued into Q3-2009. During this period, the US unemployment rate grew from 5.01% to 9.7%; the rate peaked during Q4-2009 at 10.09%. During the same period in New Mexico, unemployment grew from 3.8% to 7.9%; New Mexico's unemployment rate peaked later, during Q2-2010 at 8.3%. During the economic recovery period, the US unemployment rate falls at a faster rate than in New Mexico. During Q1-2014 the US unemployment rate fell below New Mexico's, and it has continued to drop to a low of 4.15% during Q1-2018. In contrast, New Mexico's unemployment rate has dropped to only 5.8% in Q1-2018. Whereas the US unemployment rate had dropped nearly 6 percentage points from its peak, New Mexico's had only dropped 2.5 percentage points. Thus, it is not clear that those wanting and willing to work in New Mexico are able to find jobs.

If individuals are unable to find work, then they cannot qualify for the EITC. Recent research examines three risks of eligibility based on program parameters: yearlong lack of earnings; earnings or income above specified thresholds; and family changes (Jones, 2015). The results of that work bring into question the effectiveness of the EITC as a substitute for welfare. It is not that the EITC does not 'work' as a policy; the program has been very successful drawing individuals into the workforce from welfare when jobs are available. However, post Great Recession, it is not clear that jobs were available for those willing to work. Moreover, it is not clear that definitive barriers to finding work are identified or addressed by poverty alleviation policies.

Prior research has shown how the EITC program encourages work (Hotz and Scholz, 2006; Meyer and Rosenbaum, 2001), as well as how its tie to labor force participation compromises its usefulness as a component of the social safety net (Williams and Maag, 2008; Moffitt, 2013). Additionally, research has examined the question of unemployment

and the EITC (Bitler et al., 2014), as well as how unemployment and EITC eligibility are co-determined (Jones, 2015). The work by Jones explored labor-market group characteristics such as education, sex, and marriage; these characteristics are strongly correlated to labor market attachment.

The research objective of this paper is to understand the characteristics of New Mexico tax filers who receive the EITC, and the differences with the low-income New Mexico tax filers who are not eligible for the EITC, relative to the parameters of the program. Using eight years of New Mexico tax data from 2008-2015, I examine EITC eligibility, EITC uptake, and the characteristics of ineligible low-income tax filers through uptake of New Mexico's WFTC. There is a risk that individuals who face the greatest barriers to labor market participation are additionally penalized by ineligibility for work incentives and/or government assistance. By uncovering differences between groups, a more fulsome analysis of existing poverty alleviation policy can be undertaken. If there are individuals who fall within the target population for receipt of the EITC, but are unable to qualify for the program, then expansion of the program continues to neglect the most vulnerable.

In what follows, I parse the criteria to receive the EITC from New Mexico tax returns. Filing status, qualifying income (earnings), and number of qualifying dependents are examined to understand how various criteria influence the probability of receipt of the EITC. I find that the number of qualifying dependents is negative for eligibility, positive for uptake, and positive as a barrier to finding work. If a tax filer with dependents can find work, then both income thresholds and benefits are greater. However, having qualifying dependents is a barrier to eligibility for the EITC vis-à-vis the inability to find work. In New Mexico, this group is over 30,000 households each year.

These results question the value of expanding the EITC during periods of high unemployment. During the 2016 legislative session in New Mexico, several proposals to double the working family tax credit benefit were proposed. New Mexico Taxation & Revenue Department economists estimated that the cost of doubling the WFTC would exceed \$50 million annually. However, expanding the WFTC fails to address pressing concern uncovered by this research: there are over 30,000 New Mexican households that, due to prolonged unemployment, are at risk of losing other welfare aid as well as failing to qualify for the EITC.

This thesis proceeds as follows: Section 2 provides information on the EITC, the WFTC, and previous literature. Section 3 outlines the data used, the creation of variables, and issues of omitted information and measurement error. Section 4 describes the empirical models used, and Section 5 concludes.

## 2. EITC BACKGROUND AND LITERATURE REVIEW

### 2.1 *The Earned Income Tax Credit & The Working Family Tax Credit*

The earned income tax credit (EITC) was first enacted in 1975 on a temporary basis. The program started as a modest tax credit that provided financial assistance to low-income, working families with children. At its inception the Senate Finance Committee Report on the Tax Reduction Act of 1975 emphasized that the EITC's prime objective should be "...to assist in encouraging people to obtain employment, reducing the unemployment rate, and reducing the welfare rolls." An original intent of the EITC was to reimburse payroll taxes for low-income tax filers for whom these taxes represent a disproportionately high percentage of earnings (Hoffman and Seldman, 2003). In one study the EITC is responsible for significantly lowering the poverty rate of its recipients, from 57% to 49%. For

households below the poverty line, the EITC fills 31% of the gap between their federal adjusted gross income and the poverty line (Simpson, Tiefenthaler, and Hyde, 2009). This program was extended several times before being made permanent by the Revenue Act of 1978. Subsequently, the credit was expanded by federal tax legislation in 1986, 1990, 1993, 2001, and 2009.

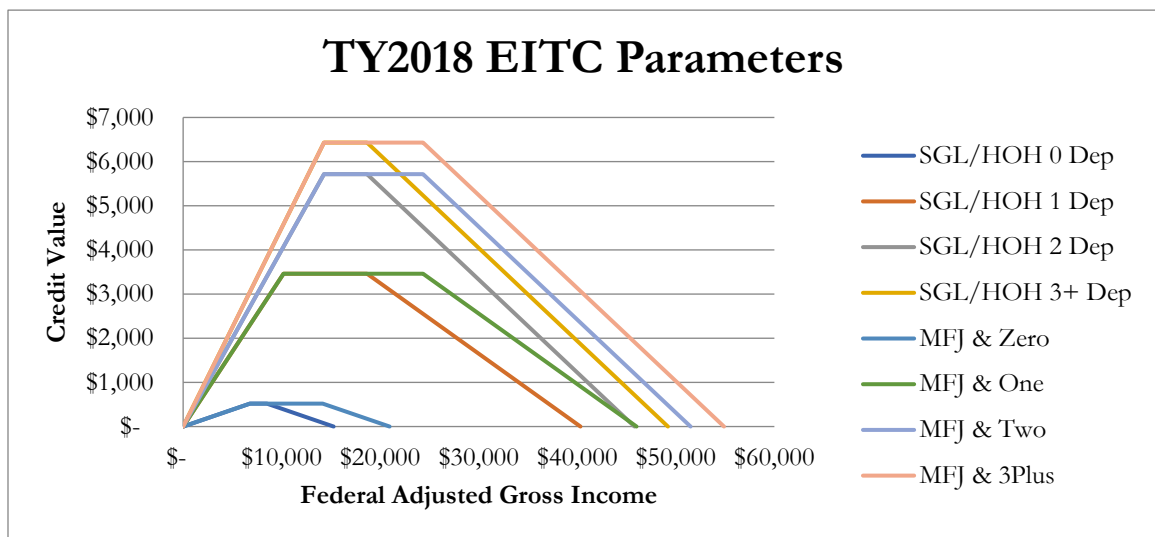
At origination, the EITC was viewed as an alternative to cash welfare. It was generally targeted toward single mothers with children. Subsequent eligibility expansion in the 90's permitted childless, low-income adults to receive the credit. Broadly, the legislative revisions to the EITC either increased the amount of the credit or revised eligibility criteria. For those who retained eligibility over the Great Recession, the EITC provided much needed income support (Larrimore et al., 2013). Today, the EITC is one of the largest anti-poverty tools in the United States. Twenty-nine states, plus the District of Columbia, have established similar programs to supplement the federal tax credit. In New Mexico the corresponding program is the Working Family Tax Credit. Tax filers who receive the EITC on their federal return may apply for and receive the state-level refundable credit valued at 10% of the EITC refund amount.

Eligibility for the program is based on specified parameters. Filing status may be single (SGL), head of household (HOH), or married filing jointly (MFJ); a filing status of married filing separate (MFS) is ineligible, regardless of other parameters. Federal adjusted gross income (FAGI) must be less than a specified threshold, determined by filing status and number of qualifying dependents, provided FAGI includes at least one dollar of earnings (wages or salary). Investment income must be less than a specified threshold. A filer loses eligibility, or is otherwise ineligible, if their filing status is MFS, their earnings drop to zero,

or their total FAGI is greater than the specified threshold defined by marital status and number of dependents. The amount of the EITC benefit depends on a recipient’s income, marital status, and number of qualifying dependents.

**Figure 1** illustrates the parameters of the EITC for tax year 2018. Each line, from left to right, represents the increase (phase-in), plateau, and decrease (phase-out) in the amount of

*Figure 1 - EITC Parameters for tax year 2018*



the credit relative to the amount of federal adjusted gross income (FAGI) provided that FAGI includes at least one dollar of earned income, by marital status. The phase-in of the EITC is calculated at a set percentage of earnings conditioned upon marital status and number of children. The phase-in is greater for more children. For example, a childless family phase-in rate is 7.65%; that is, for each additional dollar of earned income, the value of the credit increases \$0.0765 until the maximum value is reached. On the other hand, a family with three or more children has a phase-in rate of 45% until the maximum value is reached. **Table 1** illustrates the income thresholds by filing status and

Table 1 - EITC income thresholds by filing status and dependents

Tax Year	No Qualifying Children		One Qualifying Child		Two Qualifying Children		Three + Qualifying Children	
	Single / HoH	MFJ	Single / HoH	MFJ	Single / HoH	MFJ	Single / HoH	MFJ
2008	\$ 12,880	\$ 15,880	\$ 33,995	\$ 36,995	\$ 38,646	\$ 41,646	\$ 38,646	\$ 41,646
2009	\$ 13,440	\$ 18,440	\$ 35,463	\$ 40,463	\$ 40,295	\$ 45,295	\$ 43,279	\$ 48,279
2010	\$ 13,460	\$ 18,470	\$ 35,535	\$ 40,545	\$ 40,363	\$ 45,373	\$ 43,352	\$ 48,362
2011	\$ 13,660	\$ 18,740	\$ 36,052	\$ 41,132	\$ 40,964	\$ 46,044	\$ 43,998	\$ 49,078
2012	\$ 13,980	\$ 19,190	\$ 36,920	\$ 42,130	\$ 41,952	\$ 47,162	\$ 45,060	\$ 50,270
2013	\$ 14,340	\$ 19,680	\$ 37,870	\$ 43,210	\$ 43,038	\$ 48,378	\$ 46,227	\$ 51,567
2014	\$ 14,590	\$ 20,020	\$ 38,511	\$ 43,941	\$ 43,756	\$ 49,186	\$ 46,997	\$ 52,247
2015	\$ 14,820	\$ 20,330	\$ 39,131	\$ 44,651	\$ 44,454	\$ 49,974	\$ 47,747	\$ 53,267

number of dependents for each year of the data set. After a medium-length plateau, the value of the credit phases out. For each additional dollar of FAGI, the amount of the EITC benefit decreases at a uniform rate that varies by filing status and number of dependents. The phase out for a childless family remains at 7.65% while the phase out for families with children is approximately half of the phase-in rate. The phase-out ends where the EITC is reduced to zero. **Table 2** illustrates the maximum credit amounts represented by the horizontal plateau lines in Figure 1.

Table 2 - Maximum Benefit of EITC

The EITC is designed to encourage and reward work; the value of the refundable credit grows with each additional dollar of earned income until a maximum

No Qualifying Children	One Qualifying Child	Two Qualifying Children	Three + Qualifying Children
<b>Maximum* Credit Amounts</b>			
\$ 438	\$ 2,917	\$ 4,824	\$ 4,824
\$ 457	\$ 3,043	\$ 5,028	\$ 5,657
\$ 457	\$ 3,050	\$ 5,036	\$ 5,666
\$ 464	\$ 3,094	\$ 5,112	\$ 5,751
\$ 475	\$ 3,169	\$ 5,236	\$ 5,891
\$ 497	\$ 3,250	\$ 5,372	\$ 6,044
\$ 496	\$ 3,305	\$ 5,460	\$ 6,143
\$ 507	\$ 3,359	\$ 5,548	\$ 6,242

value is achieved. The program has been successful in creating an incentive for people to leave welfare for work (Meyer and Rosenbaum, 2001) as well as for low-wage workers to increase their work hours (Crandall-Hollick, 2018). However, the program – and much of the current literature – assumes that jobs are available for the targeted population.

Additionally, the program favors families with children. Low-wage workers not raising children are the group that does not realize particular benefit from the EITC.

The EITC is unable to overcome inefficiencies in the labor market. There is a risk that individuals who are willing and able to work, but unable to find employment, will either not qualify for EITC benefits or not qualify for maximum benefits. A large body of research has demonstrated that the EITC was instrumental in drawing targeted groups into the workforce; however, this research was conducted during periods when the economy was expanding and unemployment rates were low (Meyer and Rosenbaum, 2001; Grogger, 2003). In New Mexico, the post Great Recession unemployment rate has remained persistently high; in 2013 the US unemployment rate drops below New Mexico's. Concurrently, jobs were being created and state & local minimum wages increased. Thus, one plausible explanation for the persistently high unemployment rate in New Mexico is that worker skills are not matched to available jobs.

Some studies suggest that a lack of awareness limits some applicants from maximizing benefits. However, another study concludes that providing information about tax incentives does not systematically affect earnings (Chetty and Saez, 2009). These studies focused on tax filers who were eligible for EITC and employed. The current structure of the EITC, established during the 1990's as part of welfare reform, is intended to draw welfare leavers into the job market. However, if work skills are not matched to available jobs, off-skilled workers willing and able to work cannot do so. The risk for these individuals is two-fold: lack of earnings disqualifies them from EITC, and welfare reform created time limits for benefits. Thus, the EITC's tie to the labor market epitomizes its weakness with regards to those who want to work but cannot find employment.

As noted previously, the Working Family Tax Credit (WFTC) is the state-level equivalent to the federal EITC. The WFTC is predicated upon receiving the EITC on a filer's federal

return and indicating so on the filer's state income tax return. The value of the WFTC equals ten percent of the filer's federal EITC. During the 2016 New Mexico First Legislative Session several bills were drafted to expand the value of the WFTC benefit. The supporting rationale was predicated, in part, upon the success of the EITC as a poverty alleviation tool. However, absent from the debate was a discussion regarding the persistently high New Mexico unemployment rate, and who would be missed by an expansion of the WFTC.

## *2.2 Efficacy of the Earned Income Tax Credit*

There is a large body of knowledge that has examined the efficacy of the EITC. One original intent was to reimburse payroll taxes for low-income earners; these taxes represent a disproportionately high percentage of their earnings (Hoffman and Seldman, 2003). The program has been credited with expanding labor market participation of single mothers (Meyer and Rosenbaum, 2001). And while the efficacy of the EITC as a "safety net" program for low-income families has been questioned (Bitler et al., 2014), for those who retained eligibility during the Great Recession, the EITC provided valuable income support (Larrimore et al., 2013). Yet, little research examines the EITC program after the Great Recession, which lasted from December 2007 through June 2009.

Bitler, Hoynes, and Kuka (2014) examined the EITC in terms of "safety net" program for low-income earners. One feature of a safety net program is its ability to raise income for its recipients. The EITC does this very well; in 2013 the program reached over 27 million households and provided over \$63 billion in tax credits. A second key feature of a safety net program is the ability to provide protection during times of need. Here, the EITC displays weakness, due to its tie to employment. Recipients must have earned income (wages or salary) to qualify. Researchers discovered that a one percentage point increase in a state's



unemployment rate leads to a 1.8 percentage increase in the total number of EITC claims. Moreover, when examining this association across different subpopulations, they find that the impact varied substantially across demographic groups (Bitler, Hoynes, & Kuka, 2014). For married tax filers, “marriage insurance” or an “added worker effect” may exist (Stephens, 2002; Juhn and Potter, 2007). Single and head of household filers don’t enjoy the benefit of an “added worker,” and full-year unemployment will result in loss of EITC eligibility.

The body of knowledge examining the connection between labor market opportunities, economic growth, and poverty and their reflection of patterns experienced over prior business cycles is robust (Bitler and Hoynes, 2010; Blank, 1989, 1993; Blank and Blinder, 1986; Blank and Card, 1993; Cutler and Katz, 1991; Freeman, 2001; Gunderson and Ziliak, 2004; Hoynes et al., 2006; Meyer and Sullivan, 2011). Essentially, as economic opportunity declines, poverty rises; as the economy recovers, poverty begins to decline. These cycles also suggest that poverty, like wages, is sticky. Various programs have been introduced to mitigate these effects; programs include unemployment insurance, food stamps (Supplemental Nutritional Assistance Program or SNAP), EITC, and cash welfare (pre-reform Aid to Families with Dependent Children (AFDC) / post-reform Temporary Assistance to Needy Families (TANF)).

The economic implications of the tie of EITC to employment cannot be understated. The goal of EITC is to increase after-tax income of low-earning taxpayers, and its eligibility is predicated upon having earned income. Federal welfare reform initiatives of 1996 sought to limit cash transfers from programs like AFDC on a lifetime use basis and created work requirements for eligibility. Additionally, unemployment benefits, in general,

can only be received for twenty-six weeks. TANF and SNAP are means tested programs, although SNAP eligibility is universal and not limited to targeted groups. During the Great Recession cash transfer programs (e.g. TANF) were not responsive to the need, reflecting a loss in protection for those at the very bottom of the income distribution (Bitler and Hoynes, 2014). And while the EITC is primarily targeted to families with children, full-year loss of employment disqualifies any tax filers from eligibility. Thus, the creation of work requirements for other welfare programs jeopardizes assistance to any tax filer that is unable to find work.

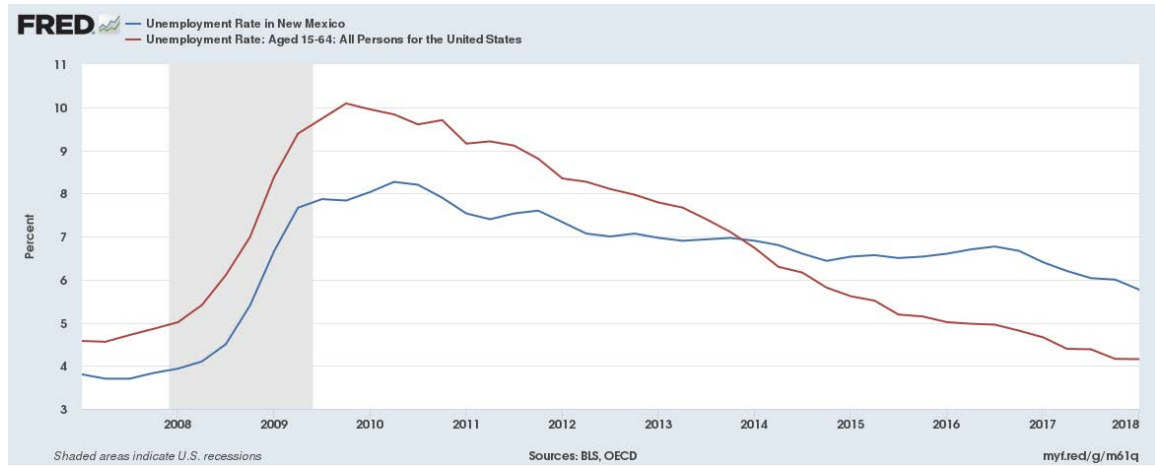
### *2.3 The EITC and New Mexico Labor Market*

A perennial debate surrounding the EITC considers further expansion versus increasing the minimum wage. While far from conclusive, some research suggests that the economic risk of increasing the minimum wage is job loss. In its current expansion, the plateau of the EITC is equivalent to an additional \$1.40 - \$2.32 per hour. The current federal minimum wage, effective July 2009, is \$7.25 per hour; thus, the EITC effectively increases wages 19% - 32% for minimum wage earners.

The New Mexico WFTC benefit is equal to 10% of the federal EITC award. The state minimum wage, effective January 2009, is \$7.50 per hour; 2019 legislation will raise the state minimum wage \$1.50 per hour each year until it reaches \$12.00 per hour in January 2023. Additionally, select counties and municipalities have alternative minimum wage laws. In 2019 the minimum wage in Bernalillo County is \$9.05 per hour; the minimum wage in the City of Albuquerque, which resides in Bernalillo County, is \$9.20 per hour. Regardless of minimum wage increases, job growth and total employment in New Mexico have been on an upward trend since the end of the Great Recession.

In New Mexico the unemployment rate rose from 3.8% to 7.9% during the Great Recession; the unemployment rate peaked at 8.3% in April 2010. In contrast, the US unemployment rate peaked at 10.09% in October 2009. **Figure 2**, created using online tools

Figure 2 - US & NM Unemployment Rates, FRED



from the Federal Reserve Bank of St. Louis, illustrates the unemployment rates in the US as well as New Mexico for the period 2007-2018. This graph is noteworthy for a few reasons. First, New Mexico starts from a stronger employment position; in 2007 New Mexico’s unemployment rate was nearly a full percent lower than the US rate at its lowest (3.7 NMUR vs 4.6 USUR). Second, US unemployment peaks sooner than New Mexico (October 2009 vs. April 2010). Finally, the US recovery, in terms of employment, has been stronger than in New Mexico; in October 2013 US unemployment dips below New Mexico. New Mexico’s economic recovery continues at a more tepid pace than the US.

The intuition of this situation is that New Mexico’s uptake of the EITC would be proportionately greater and sustained longer than the US overall. However, this trait is not explored here. Rather, if the correlation between poverty and unemployment is strong and positive, then we expect EITC uptake in New Mexico to decline as unemployment declines. Complicating any interpretation is that New Mexico labor market data seems to be

contradictive: job growth and total employment is accelerating, but unemployment is declining slowly.

The implication here is that there are individuals who are willing and able to work but cannot find it. Welfare reform placed time limits on benefits; recipients unable to find employment face a double jeopardy. If welfare recipients cannot find employment, they lack wages and are ineligible for the EITC. Further, time limits on benefits are not mitigated by sustained unemployment, and when the limits are reached the benefits are withdrawn. This group is the target of my research. By identifying those at risk of losing public assistance as well as failing to find work, I hope to broaden the debate to include those otherwise “lost.” This is an evolving area of research.

### 3. DATA

#### 3.1 *New Mexico Taxpayer Data*

With the written permission of the Secretary of Taxation and Revenue for the State of New Mexico, I obtained – and redacted – eight years of New Mexico personal income tax data. The data is self-reported by New Mexico tax filers. New Mexico law imposes income tax on the net income of every resident and the net income of every nonresident employed or engaged in business in the state. Additionally, if an individual is required to file a federal income tax return, then they are required to file a state income tax return. On average, there are approximately 1.1 million personal income tax filers in any tax year.

In accordance with NMSA 7-1-8 and federal law, the data is aggregated and redacted to ensure the confidentiality of the taxpayer’s return and return information. For each tax year I obtained data extracted from New Mexico personal income tax forms. In each year I limit the data set to New Mexico residents only with federal adjusted gross income between

negative \$50K and positive \$150K. This eliminates the 1<sup>st</sup> and 100<sup>th</sup> percentiles of the data to protect individual taxpayer information. Across the 98-percentile remaining there are more than three observations at each income level. Although the data is aggregated for analysis, this additional step ensures that no individual taxpayer information could be uniquely identified. While the population of New Mexico personal income tax filers exceeds 1.1 million annually, the sample data set created here consists of approximately 850,000 observations for each tax year for the period 2008 – 2015. Any unique taxpayer information that was used to create the final data set is deleted. I create a new identifier to track observations across time; this variable is independent of any previously obtained – and redacted – taxpayer information.

The data gathered for this research encompasses the tax records from the first full year of the recession and two years past the inversion of the US/NM unemployment rates. The full panel set consists of over 1.4 million unique observations (wide). For a specific tax year there exists approximately 850 thousand observations. The reason for the disparity is attributed to observations moving in or out of individual year data.

There are several reasons an observation might move in or out of the data. First, the data is censored for federal adjusted gross income in a specified range; if an observation reports FAGI outside these parameters, they fall out of the sample. Observations are limited to New Mexico residents, only. Partial year residents and non-residents are excluded from the sample; thus, relocation would move an observation in or out of the sample. Finally, observations are limited to tax filers that have a tax type of “R;” R-filers – in contrast to B-filers – have their tax liability calculated directly from their New Mexico Taxable Income (NMTI), without adjustment for non-New Mexico derived income. B-filers report some

amount of non-New Mexico derived income, and thus are excluded from the sample. If a tax filer changes their tax type from R in any year (i.e. report non-New Mexico derived income), they would be dropped from the data set for that year.

Absent from this dataset are non-filers; thus, each category/variable may be slightly understated due to this omitted information. Various sources estimate that approximately 5% of American fail to file a federal tax return each year (IRS Statistics for Tax Returns, 2016). That corresponds to approximately 42,250 New Mexicans. Additionally, there are both measurement error and omitted information issues that results in an understatement of subgroups.

Any taxpayer who files a personal income tax return is required to use the primary personal income tax form: the PIT-1. A tax filer indicates application for the New Mexico Working Family Tax Credit by entering the amount of the WFTC on line 25 of the PIT-1 and the amount of the EITC on line 25a. Additional forms are required predicated upon the unique circumstances of the tax filer. Low-income earners can file a PIT-RC to receive various rebates and credits offered in New Mexico. Integral to receiving some of these targeted programs is calculating a tax filer's modified gross income. Lines 4 through 11 of the PIT-RC are used to enumerate sources of income; the sum of lines 4 through 11 are entered on line 12 of the PIT-RC.

New Mexico "modified gross income" (NM MGI) is an income definition that is unique to New Mexico and is used exclusively to establish eligibility for select state tax programs. NM MGI includes all income of the taxpayer, undiminished by losses, including some federally tax-exempt sources of income. PIT-RC line 4 represents wages and salaries

reported for the tax year; line 6 enumerates unemployment and worker's compensation benefits. I use this information to create variables.

Thus, another omitted information issue is attributed to tax filers not submitting a PIT-RC. In general, if a filer's NM MGI is greater than \$35,000, then a PIT-RC is unnecessary; the filer is unlikely to qualify for the programs on that form. Consequently, missing values for wages and unemployment must be addressed when I create my variables. Omitted information due to not filing specific forms is the most pervasive issue in the data.

Measurement error is also persistent. All personal income tax forms are completed by the tax filer; thus, mistakes can be made. Transferring entries from federal forms, tax withholding documents, and other documents needed to file income tax returns, as well as computational mistakes, produces missing information as well as impossible values. When I create variable and subgroups, I take steps to address these issues, resulting in values being understated.

### *3.2 Eligibility Criteria of the Earned Income Tax Credit*

Eligibility for the EITC is determined by conformance to parameters involving filing status, sources of income, and number of qualifying dependents. Receipt of the EITC is dependent upon three prerequisites: a recipient must file a federal income tax return; a recipient must have earned income (wages or salary) in the tax year; and the recipient must specifically file for the credit. Receipt of the New Mexico WFTC is dependent upon similar prerequisites: a recipient must file a state income tax return; a recipient must specifically file for the credit; and the recipient must affirm that they received the EITC.

A tax filer is eligible for the EITC if their filing status is not married filing separate (MFS); they report earned income of at least one dollar; they report investment income less

than a specified threshold; and they report total federal adjusted gross income (FAGI) less than a specified threshold. The FAGI parameter scales based on filing status and the number of qualifying dependents a tax filer reports. **Table 1**, above, illustrates these parameters for the study period.

In using state income tax return data to determine eligibility and receipt of the EITC, there is a risk that receipt is overstated due to measurement error. Specifically, if a tax filer makes entries on PIT-1 lines 25 and 25a, then the WFTC is awarded. While the value of line 25a is the amount of the benefit from the EITC, there is no cross-validation of eligibility. To account for this risk, I extract specific entries from the New Mexico personal income tax forms to establish eligibility. PIT-RC line 4 is an entry for wages; PIT-RC line 6 is an entry for unemployment. If the value of the PIT-RC line 4 is greater than zero, than an observation is presumed to have met the earned income requirement.

Several definitions of income manifest in the data. This is attributed to differences between federal tax law and state tax law. The income terms used include federal adjusted gross income (FAGI), New Mexico taxable income (NMTI), and New Mexico modified gross income (NM MGI). FAGI is an individual's total gross income minus specific federal deductions. Federal taxable income is FAGI minus allowances for personal exemptions and itemized deductions; this calculation is distinct from NMTI. New Mexico's personal income tax calculations are derived from FAGI. Although the New Mexico personal income tax regime is coupled to federal law, there is not a 1:1 alignment of FAGI to NMTI. That is, an individual's FAGI is used to calculate an individual's NMTI, but individual circumstances vary sufficiently that an individual taxpayer cannot be identified by observing this data. This characteristic is particularly apparent in tax year 2011-2014 when the variance in the upper



quintiles of FAGI and NMTI is greatest. Finally, NM MGI is unique to New Mexico. The calculation of NM MGI is constructed on the PIT-RC, and it enumerates all sources of income. It is the enumerated sources of income for NM MGI that allows me to create the variables necessary to determine earned income and unemployment.

Using this information, I generate subcategories of tax filers for this analysis. However, recall that tax filings are self-reported; therefore, although some verification is required, erroneous filings occur. Additionally, state tax programs that use NM MGI require total NM MGI to be less than thirty-five thousand dollars (\$35,000). Consequently, not all tax filers report information on a PIT-RC. I take several steps to account for this in the data.

First, for my analysis, I need to generate an indicator for EITC eligibility, regardless of whether the filer received EITC, as eligibility is not explicitly reported in the data. Key variables from my data used to indicate eligibility are federal adjusted gross income (FAGI), New Mexico taxable income (NMTI), filer's declared exemptions, filer's number of qualifying dependents, and select characteristics of income. Taxpayer filing status variables include single (SGL), head of household (HOH), married filing jointly (MFJ), and married filing separate (MFS). I use this information to ascertain eligibility for EITC, and I estimate whether a filer received EITC vis-à-vis the New Mexico WFTC. Wages and unemployment income are used to estimate the number of years was employed and/or unemployed.

### *3.3 Variables*

To estimate eligibility and to categorize observations into groups, I created qualification variables to address filing status, types of income, number of qualifying dependents, and federal adjusted gross income thresholds. The variable *Treated* equals one if the values on PIT-1, lines 25 & 25a are greater than zero, and zero otherwise. This indicates receipt of the

WFTC. I use the receipt of the WFTC as evidence of treatment of EITC. In other words, if  $WFTC > 0$ , then I assume that the observation also received the EITC. The variable Eligible equals one if the enumerated qualification criteria are met, and zero otherwise. I create three eligibility criteria variables to define eligibility.

Q01\_FS is the first eligibility qualification criteria, derived from filing status. The value is zero if the filing status is married filing separate (MFS); it is one otherwise. Q02\_wages is one if a filer reports wages and/or salary on the PIT-RC line 4; it is zero otherwise. This variable is susceptible to both omitted information and measurement error, as not all filers complete a PIT-RC, and there exist errant entries for some observations. However, the third eligibility criteria acts to mitigate some amount of this problem.

Q03\_zero, Q03\_one, Q03\_two, and Q03\_3plus are variables that incorporate the EITC FAGI thresholds by filing status and number of qualifying dependents. Each variable is mutually exclusive; they are one if the observation reports FAGI within the threshold for the number of dependents (see **Table 1**), and zero otherwise.

If the variables for filing status, wages, and FAGI thresholds by qualifying dependents are each one, then Eligibility is estimated. The variables Treated and Eligible are then used to create subgroups for analysis.

The sources of income variables, wages and unemployment, are used to estimate employment. If an observation reports wages in a tax year, then the variable InLabor (employed) is one and zero otherwise. If an observation reports unemployment in a tax year, then the variable OutLabor (unemployed) is one and zero otherwise. These conditions are not mutually exclusive. In any given tax year an observation can report employment and unemployment. Long term unemployment can be estimated when OutLabor equals one for

two or more consecutive tax years and InLabor is zero in the corresponding periods. When InLabor and OutLabor are both one for consecutive tax years, it is an indication that labor market attachment is tenuous.

### *3.4 Research Groups*

I create several new variables to observe conditions over time for sub-groups of interest. Specifically, using the available data, I created six sub-groups of interest for my analysis: (i) Of Interest, (ii) Recipients, (iii) Skeptics, (iv) Ascendants, (v) Benefactives, and (vi) Omitted Information Group. The data is distilled to isolate any Of Interest group members that are present in all eight years of the data.

#### *Recipients (Eligible = 1; Treated = 1)*

Recipients of the Earned Income Tax Credit are the most widely discussed group in the literature. Eligibility criteria requires earned income of at least one dollar; investment income less than an annually specified threshold; FAGI less than a specified threshold conditioned upon filing status and number of qualifying dependents; and the filer must not file married filing separate (MFS). The amount of the credit is predicated on the number of qualifying dependents reported by the filer and total federal adjusted gross income reported.

#### *Skeptics (Eligible = 1; Treated = 0)*

The Skeptics group is subject of recent literature referenced. Broadly, this group consists of two subgroups. The first is filers who are unaware of the program; the second is filers who are aware of the program but are apprehensive about applying.

#### *Ascendants (Eligible = 0; Treated = 0; Income > Threshold)*

Ascendants represent a story of economic success and are not a focus of study. However, this group is understated due to omitted information. Specifically, some percentage of observations in the Omitted Information Group would be categorized as Ascendants but for missing information on wages.

*Benefactives (Eligible = 0; Treated = 1)*

This group is a group that represents a shortcoming in the data. It is likely that many of those identified in this group should be categorized as Recipients. However, the manner of calculation and collection of NM MGI data skews the way the group is created.

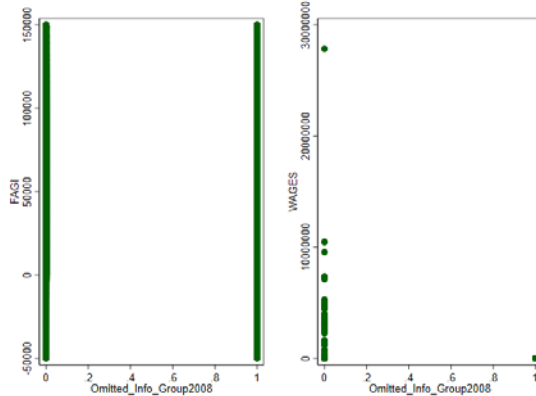
*Of Interest (Eligible = 0; Treated = 0; Income < Threshold; Filing Status ≠ Single; Qualifying Dependents > 0)*

This group is the primary group of interest in this analysis and represents taxpayers with income less than the EITC threshold, but due to a lack of earned income do not receive EITC. A couple of the criteria warrant comment. First, this group is understated by eliminating all single filers with zero dependents previously sorted. Including these filers would instead overstate this group as there are circumstances where an observation is ineligible and untreated, but not subjected to economic hardship. An example is a college student that works and is claimed as a qualifying dependent by a parent. While the student may meet the criteria of the Of Interest group, their status as a dependent precludes broader eligibility for EITC. I therefore create a final group to address this problem. Despite this isolation, the observations remain ineligible and untreated.

*Omitted Information Group (OIG) (Eligible = 0; Treated = 0; Income < Threshold; Filing Status = Single; Qualifying Dependents = 0)*

When I recognized that an omitted information condition was affecting my research groups, this group was created to ensure the Of Interest group is not overstated. Due to omitted information, the observations sorted into this group would otherwise be categorized elsewhere. All observations in the OIG are single and have zero dependents. Some percentage of this group represent dependents of other filers. High school and college students who work, for example, would not be properly sorted as ineligible for EITC but are not otherwise divorced from the Of Interest group. Some percentage of this group represents single filers who should be sorted as Ascendants; this is indicated by **Figure 3**, which is a two-way scatter graph. **Figure 3**

*Figure 3 - Evidence of Omitted Information*



is constructed from TY2008 data, and it is representative of the problem in each tax year. The left panel illustrates FAGI, and OIG observations have FAGI values continuous from negative 50K through positive 150K. To be eligible for EITC, FAGI must be less than a specified threshold; in 2008 the cap for single filers was \$12,880. Thus, every observation with  $FAGI > 12,880$  are truly not eligible. The right panel plots wages, and the OIG group indicates zero. Additionally, due to the requirements of the PIT-RC, it is unexpected to see wage values greater than \$35,000 from non-OIG observations. I attribute this to reporting errors by the tax filers; this type of error is present in each tax year to varying degrees.

Observations categorized as Recipients, Skeptics, and Ascendants are not affected by NM MGI in a meaningful way, relative to this research. However, Benefactives and Omitted Information Group are implicated by the NM MGI in its calculation and reporting.

Although Benefactives are not in the primary research group, it is likely that the number of Benefactives (eligible = 0, treated = 1) are overstated. Specifically, observations that neither file a PIT-RC nor report wages on a submitted PIT-RC and received WFTC could be mistakenly included here. If an observations federal adjusted gross income included wages and was between \$35,000 and the phase-out gross income cap in any tax year, then they are likely mis-categorized.

The Omitted Information Group (OIG) was created to address concerns relating to the Of Interest group. The OIG consists of single filers with zero qualifying dependents. Demographic analysis of New Mexico census data indicates that some portion of this group are dependents of other taxpayers (e.g. high school or college students that work). Many of these tax filers would not be required to complete a PIT-RC form, and thus, data needed to properly classify members of this group is missing.

### *3.5 Summary Statistics*

**Table 3** describe the data pooled and pre and post 2010. The program was last expanded in 2009; I separate the periods to capture any changes in variables before and after that expansion. Filing status variables, qualification criteria, sub-groups, and labor market variables are dichotomous. Federal adjusted gross income, wage income, and unemployment income are continuous variables. FAGI can be negative; wage and unemployment income are non-negative. Exemptions and qualifying dependents are discreet variables indicating the number of exemptions claimed and the number of qualifying dependents for EITC, respectively. Treated is one if the observation received the NM WFTC and zero otherwise. Eligible is one if the observation met all qualification criteria and zero otherwise.

Filing status is consistent across the time periods. On average, approximately one percent of New Mexicans file married filing separate, and approximately 64% of all tax filers are unmarried. The filing status variable is reflected in the first qualification criteria variable; approximately one percent of tax filers are ineligible because of filing status.

Family and household size, as estimated by exemptions and qualifying dependents, are consistent across the expansion date of the EITC program. This is also reflected in the qualification criteria involving dependents. In contrast, the mean of earned income changes across the expansion date, with post-2009 values nearly 8% less than pre-2010. However, this is consistent with labor market conditions, as the New Mexico unemployment rate climbed steeply over the same period.

The previously stated concern regarding omitted information and Benefactives is illustrated in the mean values of Recipients and Benefactives. Specifically, some portion of

Table 3 - Full Panel Summary Statistics

	<u>Full Panel</u>		<u>Pre 2010</u>		<u>Post 2009</u>	
	mean	sd	mean	sd	mean	sd
<b>Filing Status</b>						
Single	0.461	0.498	0.454	0.498	0.463	0.499
Married Filing Jointly	0.341	0.474	0.349	0.477	0.338	0.473
Head of Household	0.188	0.391	0.187	0.39	0.189	0.391
Married Filing Separate	0.01	0.0997	0.00998	0.0994	0.01	0.0997
<b>Characteristics</b>						
Federal Adjusted Gross Income	37,535	33,629	36,123	32,828	38,011	33,881
Qualifying Dependents	0.701	1.077	0.7	1.064	0.701	1.081
Exemptions	2.04	1.263	2.048	1.255	2.038	1.265
Wage Income	3,369	18,398	4,808	30,740	2,883	11,527
Unemployment Income	134.3	1,161	165.8	1,303	123.6	1,109
<b>Qualification Criteria</b>						
Q01-Filing Status	0.99	0.0997	0.99	0.0994	0.99	0.0997
Q02-Earned Income	0.242	0.428	0.302	0.459	0.221	0.415
Q03-Zero Dependent	0.618	0.486	0.614	0.487	0.619	0.486
Q03-One Dependent	0.107	0.309	0.106	0.308	0.107	0.309
Q03-Two Dependent	0.0819	0.274	0.0841	0.278	0.0812	0.273
Q03-3+ Dependent	0.0515	0.221	0.0463	0.21	0.0533	0.225
<b>Sub-Groups</b>						
Skeptics	0.0927	0.29	0.0978	0.297	0.091	0.288
Recipients	0.145	0.352	0.2	0.4	0.126	0.332
Benefactives	0.103	0.304	0.0303	0.171	0.128	0.334
Ascendants	0.139	0.346	0.147	0.354	0.137	0.344
Of Interest	0.0356	0.185	0.0401	0.196	0.0341	0.181
Omitted Info Group	0.474	0.499	0.475	0.499	0.474	0.499
Observations		6,764,251		1,706,872		5,057,379
<b>Labor Market</b>						
Employed	0.55	0.498	0.582	0.493	0.539	0.498
Unemployed	0.419	0.493	0.417	0.493	0.42	0.494
Observations		11,394,368		2,848,592		8,545,776

the post-2009 observations sorted as Benefactives should be correctly sorted as Recipients.

Thus, Recipients are understated and Benefactives are overstated across the expansion date.

**Table 4** reports descriptive statistics across each of the subgroups. If filing status was normally distributed across the sub-groups, then the mean of filing statuses in the full panel would be reflected in the sub-groups. However, due to omitted information and measurement error, the construct of the sub-groups was manipulated so that the Of Interest group would not be overstated. The skew toward single filers in the OIG is a direct result of this adjustment.



Table 4 - Summary Statistics of Sub-Groups

	<u>Of Interest</u>		<u>Recipients</u>		<u>Benefactives</u>		<u>Skeptics</u>		<u>Ascendants</u>		<u>Omitted Information Group</u>	
	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd
<b>Filing Status</b>												
Single	0.114	0.317	0.338	0.473	0.156	0.363	0.844	0.363	0.0256	0.158	0.653	0.476
Married filing Joint	0.413	0.492	0.162	0.368	0.357	0.479	0.0748	0.263	0.709	0.454	0.337	0.473
Head of Household	0.473	0.499	0.5	0.5	0.487	0.5	0.0812	0.273	0.265	0.442	0.00929	0.096
Married filing Separate	0	0	0	0	0.00019	0.0139	0	0	0	0	0	0
<b>Characteristics</b>												
Federal Adjusted Gross Income	23,796	14,227	13,587	8,376	23,393	12,139	14,487	10,645	77,422	27,785	41,770	35,031
Qualifying Dependents	1.883	1.079	1.285	1.096	1.651	1.156	0.237	0.705	1.811	0.991	0	0
Exemptions	3.288	1.282	2.446	1.222	3.006	1.335	1.311	0.821	3.517	1.179	1.337	0.473
Wage Income	0	0	12,805	12,686	13.04	757.5	14,093	46,543	1,332	24,359	0	0
Unemployment Income	283.8	2,039	460.9	1,960	28.1	557.4	323.7	1,704	8.709	323.7	46.92	781.7
<b>Qualification Criteria</b>												
Q01-Filing Status	1	0	1	0	1	0.0139	1	0	1	0	1	0
Q02-Earned Income	0	0	1	0	0.00036	0.019	1	0	0.0186	0.135	0	0
Q03-Zero Dependent	0	0	0.272	0.445	0.151	0.358	0.87	0.337	0	0	1	0
Q03-One Dependent	0.483	0.5	0.342	0.474	0.335	0.472	0.0617	0.241	0	0	0	0
Q03-Two Dependent	0.273	0.445	0.257	0.437	0.305	0.46	0.0397	0.195	0	0	0	0
Q03-3+ Dependent	0.245	0.43	0.13	0.336	0.207	0.405	0.0288	0.167	0	0	0	0
<b>Labor Market</b>												
Employed	0	0	1	0	0.00036	0.019	1	0	0.0186	0.135	0	0
Unemployed	0.0232	0.151	0.0879	0.283	0.0038	0.0615	0.0592	0.236	0.00125	0.0353	0.00483	0.0693
Observations	240,649		980,137		696,525		627,104		943,207		3,208,909	

The non-zero value for married filing separate under Benefactive is supportive evidence of IRS estimates that some EITC claims are paid in error. While a tax filer is normally required to use the same filing status in New Mexico as used on their federal return, that may not always be the case. Thus, the non-zero value for MFS is also evidence of measurement error.

The balance of the descriptive statistics is supportive of the steps taken to create each sub-group while addressing omitted information and measurement error. The Of Interest group does not have observations with zero dependents; regardless of dependents, Ascendants enjoy a mean FAGI that is 1.85 to 5.7 times greater than other sub-groups. Additionally, the Of Interest group is understated as the Omitted Information Group contains observations that are similarly situated as Of Interest.

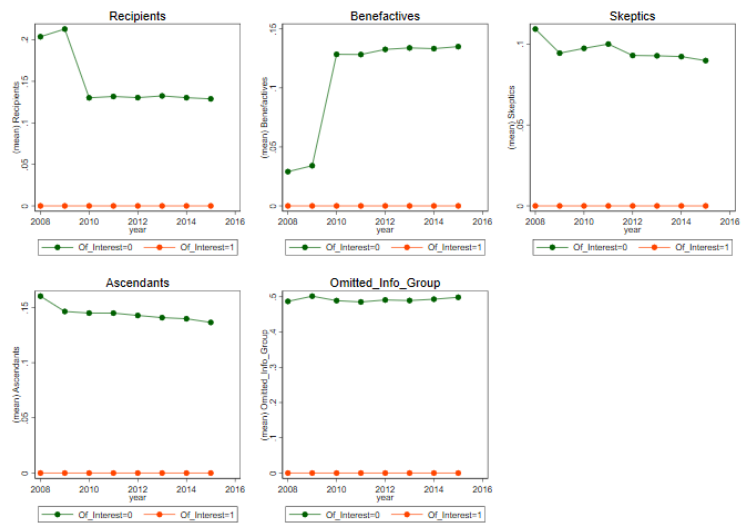
### 3.6 Graphical Analysis of Variables

While the summary statistics describe the means of the panel and the sub-groups, it is difficult to discern how the sub-groups change over time. Accounting for the missing information in the data and isolating the Of Interest group was one of the greatest challenges of this research effort.

There are six groups generated from the data: Recipients, Skeptics, Benefactives, Ascendants, Omitted Information Group, and Of Interest. **Figure 4** plots the proportion of filers falling into each group across years, with the Of Interest group removed from each. The constructed panel illustrates recognized concerns in the data. First, the sharp drop in

the number of Recipients corresponds to a sharp increase in the number of Benefactives across the program expansion date. As noted previously, I attribute this to missing information

Figure 4 - Proportion of Filers by Sub-Group

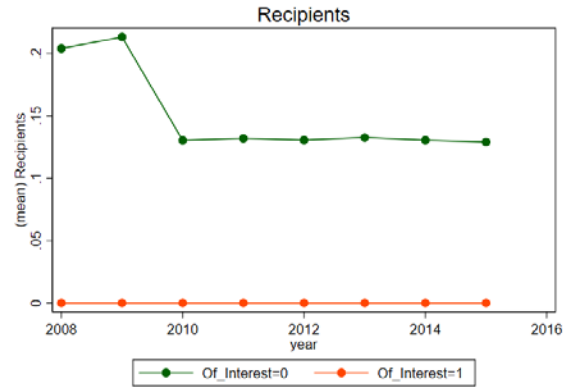


and measurement error. An interesting trend, not investigated here, is the decline in the number of Skeptics over time.

**Figure 5** is the two-way scatter graph illustrating the proportion of Recipients in the data set over time. Amongst New Mexico tax filers the number of recipients drops significantly in 2010, yet the EITC program

was expanded in 2009. I attribute this to the omitted information issue previously identified. The number of Recipients is understated, with some observations being erroneously sorted as Benefactives, or purposefully sorted into the OIG.

Figure 5 - Proportion of Recipients

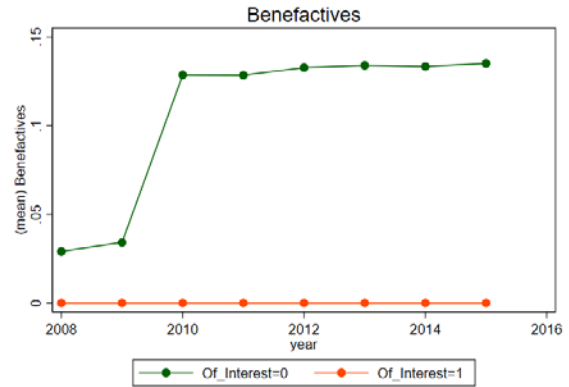


As noted previously, NM tax policy requires a PIT-RC form for tax files seeking certain tax rebates. The rebates are means tested; filers are ineligible for various state-specific programs if New Mexico modified gross income (NM MGI) exceeds \$35,000. However, EITC is means tested on federal adjusted gross income (FAGI), and the income thresholds scale based on filing status and number of qualifying dependents. In 2009 the expansion of the EITC increased the payout for families with three or more qualifying dependents and increased FAGI thresholds to amounts significantly greater than the NM MGI cap (see **Table 1**). Consequently, the Recipients group is understated, and the Benefactives group is overstated.

The drop in the number of categorized Recipients in 2010 correlates to an increase in the number of Benefactives in the same year. **Figure 6** is a two-way scatter graph that illustrates the proportion of Benefactives in the data set over time. It is unlikely that the

increase is due to a program error. Rather, the algorithm used to sort observations into their appropriate group was impacted by an omitted information issue, previously discussed.

Figure 6 - Proportion of Benefactives

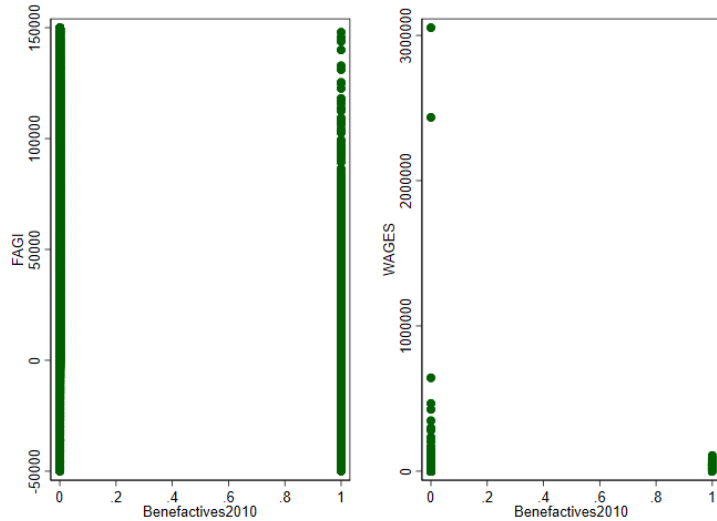


To verify that the root cause is omitted information, I create a two-way

scatter graph for each year for FAGI and wages. **Figure 7** is constructed from tax year 2010 data, and it is representative of all the years. The left panel is FAGI; the line is continuous through \$150,000 for non-Benefactives and has few breaks through \$150,000 for members

Figure 7 - Omitted Information Evidence - Benefactives

of the group. Referring to **Table 1**, the maximum FAGI threshold was \$48,362. Thus, any Benefactive with income greater than threshold is correctly identified as ineligible. Observations



with FAGI less than the threshold are eligible if at least one dollar of FAGI is earned income (wages or salary), subject to filing status and dependent restrictions.

True Benefactives are observations with FAGI greater than the filing status income thresholds. Benefactives are observations that are ineligible for the EITC but received it.

**Figure 7** is illustrating two problems in the data. The right panel plots wages, and most

Benefactive wages plot at zero. Thus, the first problem illustrated is every Benefactive with FAGI less than the filing status threshold (the means cap is predicated upon filing status and number of qualifying dependents), and has wages is erroneously sorted. Properly sorted, they are Recipients. However, the data does not include the necessary wage information to properly sort the observations. This is the second problem illustrated.

There exist other conditions indicative of true Benefactives. The IRS estimates that between 21% and 26% of EITC claims are paid in error. Some of the errors are unintentional, but some claims are intentional disregard of the law. More than 27 million recipients received approximately \$67 billion in federal EITC benefits during 2015. IRS Statistics for Tax Returns with EITC estimates that approximately 214 thousand tax filers received an average benefit of \$2,405 for TY2015; the total value of EITC in New Mexico in that year was approximately \$515 million. In New Mexico the corresponding state program – the Working Families Tax Credit – was received by over 212 thousand tax filers with an expenditure of approximately \$52.3 million for the same tax year.

Based on IRS estimates, errant payments cost the US approximately \$16 billion each year; in New Mexico errant payments of the EITC amount to approximately \$123.6 million in federal funds, and errant payments of the WFTC amount to approximately \$12.6 million of state funds. Three mistakes documented by the IRS account for more than 60% of all errors on EITC claims. These are 1) claiming a child that does not meet the qualifying tests; 2) filing either single or head of household when married; and 3) over or under-reporting income.

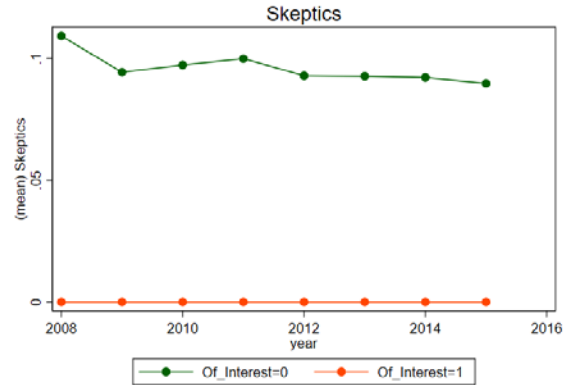
The reason misreporting of filing status is considered an errant payment may not be immediately obvious. Filers who report being single or head of household when they are

married, but separated, report incorrectly. Recall that MFS are ineligible for EITC. Thus, this mistake is indicative of filers who should file as MFS but do not. Additionally, this data set is built from state-level tax data. While New Mexico tax law requires an income tax filer to use the same filing status as used on their federal return, it is possible that the filer uses a different filing status for each. Thus, the Benefactives group may be overstated because of measurement error attributed to different filing status.

Although Skeptics are not a focus group for this project, my literature review discovered several papers suggesting individuals are not fully informed about tax programs and transfer programs (e.g., de Bartolome 1995, Duflo et al. 2006, Chetty, Looney, and Kroft 2009, Jones 2010, Liebman and Luttmer 2011). **Figure 8** is a two-way scatter graph illustrating the proportion of Skeptics in the data set over time. Various experiments have been performed to inform tax filers about

Figure 8 - Proportion of Skeptics

EITC and other programs and evaluate how gaining information may affect their economic choices. Additionally, there are instances where filers choose to disassociate from eligibility or avoid application for fear of audit. Regardless, this group is eligible but not treated, whereas the research group of interest is neither eligible nor treated.



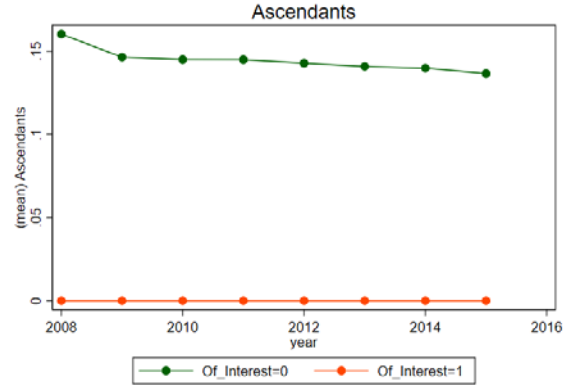
While having a child significantly alters the value of the EITC, the IRS estimates that the largest segment of eligible taxpayers who fail to claim the EITC are low-income workers without children. Many low-income workers without children are not required to file a tax return; to receive the EITC a recipient must, at least, file a federal tax return.

**Figure 9** is a two-way scatter graph illustrating the proportion of Ascendants in the data set over time. During the study period the number of Ascendants in New Mexico appears to decline. This is not surprising.

Researchers discovered that a one percentage point increase in a state's unemployment rate lead to a 1.8 percent increase in the total number of EITC claims; moreover, the impact varied substantially across demographic groups

(Bitler, Hoynes, & Kuka, 2014). In New Mexico the unemployment rate rose from 3.8% to 7.9% during the Great Recession; the unemployment rate in New Mexico peaked at 8.3% in April 2010. Thus, we would expect to see some decline in the number of filers enjoying economic success.

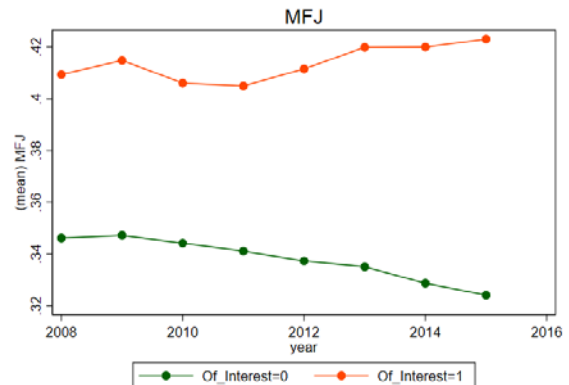
Figure 9 - Proportion of Ascendants



**Figure 10** is a two-way scatter graph that illustrates the proportion of married filing jointly (MFJ) that in the Of Interest group and the proportion that are not Of Interest over time. In general, the behavior of filing statuses over time in this data set appears to be consistent with existing research. In particular, the concept of “marriage insurance” or

“added worker effect” and receipt of EITC is illustrated here. During the study period the number of MFJ Of Interest observations increases slightly, while the number of non-Of Interest MFJ observations decreases.

Figure 10 - Behavior of Married Filing Jointly Over Time



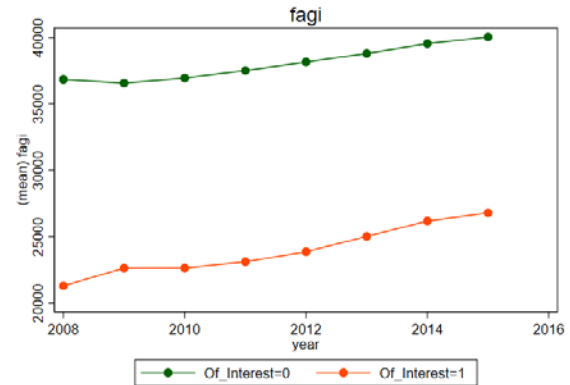
“Marriage insurance,” as it relates to EITC, indicates that a married household that lost a source of income becomes eligible for EITC. Further, multi-income households are expected to lose eligibility faster than single income households. Thus, the negative slope of Of Interest = 0 is explained by previous research. However, the slightly positive slope for MFJ Of Interest is not fully understood. Demographic data to examine this trend is not available in the data set.

**Figure 11** illustrates the movement of mean federal adjusted income (FAGI) for all observations over time, sorted between the Of Interest group and all others. FAGI trends upward for all observations over the time period. This is a stark contrast to conditions in the labor market.

Unemployment peaked in New Mexico in mid-2010 (see **Figure 2**). Additionally, FAGI is left and right censored to comply with federal and state confidentiality laws

pertaining to taxpayer data. The FAGI range throughout the observation period was set at negative \$50K through positive \$150K. The upward trend is not fully understood. One plausible explanation is that the number of tax filers reporting losses (negative FAGI) declines, as losses are reported in the tax year of the event and generally not carried forward. However, this does not explain the nearly parallel track of the mean of FAGI for the Of Interest group.

Figure 11 - Mean of Federal Adjusted Gross Income Over Time



**Figure 12** displays the proportion of all observations reporting employment over time in the left panel, and the mean of earned income reported for all observations in the



right panel. Employment

Figure 12 - Employment Implications over Time

translates to wages, and

therefore, the mean of the

Of Interest group in both

panels is zero. The left

panel of **Figure 12** is

complementary to **Figure 2**;

InLabor is a dichotomous

variable predicated upon



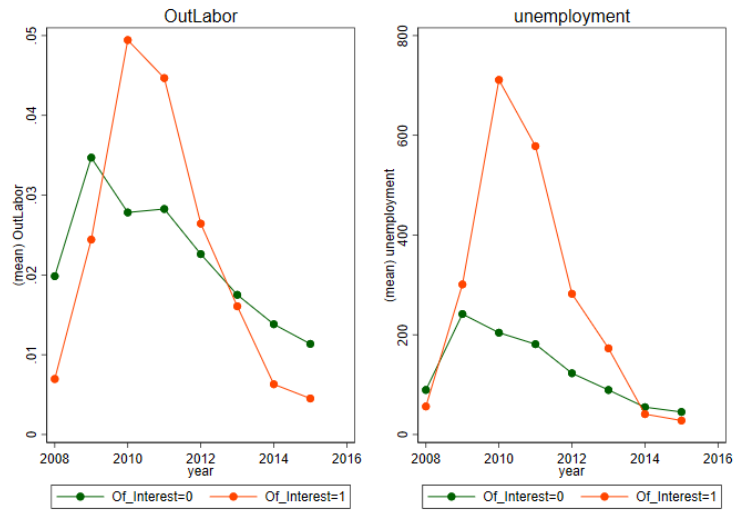
observations reporting wages in any year (denoted as “Employed” in the Labor Market variables of the summary statistics). However, due to omitted information, employment must be understated. Bureau of Labor Statistics data, compiled from New Mexico Department of Workforce Solutions data, indicate that while unemployment did significantly increase, the available tax data understates the number of observations with earned income.

It is not immediately clear why the two sides of the graphic are strikingly similar; the panels are measuring two different quantities. The left panel is a dichotomous variable that indicates the proportion of observations reporting employment, derived from wages > zero. The right panel is the mean of wages reported. The visualizations of unemployment and unemployment income are similarly situated.

**Figure 13** displays the characteristics of unemployment over time. The left panel labeled OutLabor – denoted as “Unemployed” in the labor market variables of the summary statistics – is a dichotomous variable predicated upon observations reporting unemployment

income in any tax year. The *Figure 13 - Unemployment Over Time*

right panel illustrates the mean of unemployment income over time for the Of Interest group and all other observations. Whereas interpretation of **Figure 12** is unclear, the interpretation of the unemployment trends is nuanced.



It is expected that **Figure 13** should have a shape similar to **Figure 2**, the FRED graphic. Additionally, it is expected that the slopes of graphs depicting unemployment should be the inverse of graphs depicting employment. However, we cannot draw the same conclusions about the shape and slopes of the lines illustrating the unemployment characteristics of the Of Interest group.

First, consider the intuition of the shape of the Of Interest = 0 lines. The left panel indicates that the number of unemployed increased and then decreased. This is supported by the right panel, where the amount of unemployment income received increased and then decreased. The intuition of the right panel, for the non-Of Interest group, is that the duration of unemployment decreases. Non-Of Interest observations report earning income at some point in their respective tax years.

Of Interest observations do not report earned income. Thus, the interpretation of their lines must be different. The number of Of Interest observations reporting

unemployment income (OutLabor) increases significantly, coinciding with the sharp increase in New Mexico's unemployment rate. The Of Interest OutLabor decreases at a similar rate. This cannot be interpreted as observations finding employment. Unemployment benefits are time limited; in general, unemployment income is exhausted after 26 weeks. Rather, the decrease in Of Interest OutLabor appears to correlate to a reduction in the mean of the Of Interest unemployment income (unemployment). Because the Of Interest group does not report earned income, employment cannot be assumed. Thus, the decrease in the mean of the Of Interest unemployment income is likely expiration of unemployment insurance benefits. Given that both graphs illustrate a negative slope that falls below the lines of the Of Interest = 0 observations, and employment recovery in New Mexico has been tepid, sustained unemployment and loss of unemployment benefits is a reasoned interpretation.

Regardless of the interpretation, the data indicates that the Of Interest group is economically worse off than others. The data, and my research, does not support causal inferences. Rather, the objective is to understand and describe how these differences manifest.

## 4. EMPIRICAL MODELS

In order to understand and describe the differences between the Of Interest group and all other observations I created three Linear Probability Models: an estimation of EITC eligibility, an estimation of EITC treatment, and qualification criteria characteristics for the Of Interest group.

My estimation model for eligibility of the Earned Income Tax Credit is:

$$EITCeligibility_i =$$

$$\begin{aligned} &\beta_0 + \beta_1 SGL_i + \beta_2 MFJ_i + \beta_3 HOH_i + \beta_4 TotQD_i \\ &\quad + \beta_5 FAGI_i + \beta_6 WageIncome_i \\ &\quad + \beta_7 UnemploymentIncome_i \\ &\quad + \beta_8 InLabor_i + \beta_9 OutLabor_i \\ &\quad + \beta_{10} year_i + \gamma_1 Post2009_i + \varepsilon_i \end{aligned}$$

where, EITCeligibility is the variable of interest and equals one if eligible and zero otherwise;

SGL, HOH, & MFJ is the reported filing status; MFS is not eligible for EITC;

TotQD equals the number of qualifying dependents reported by the filer;

FAGI is the reported federal adjusted gross income and is between -\$50K and \$150K in any tax year;

Wage Income is the reported wages on the PIT-RC in any tax year;

TY2008-TY2015	
Estimation of EITC Eligibility	
VARIABLES	LPM-areg
SGL	0.154*** (0.00142)
MFJ	0.151*** (0.00141)
HOH	0.156*** (0.00143)
TotQD	-0.00129*** (6.34e-05)
fagi	-1.22e-07*** (4.92e-09)
wages	-4.54e-07*** (1.74e-07)
unemployment	-6.42e-07*** (6.63e-08)
InLabor	0.984*** (0.00258)
OutLabor	0.00333*** (0.000518)
year	0.000349*** (1.61e-05)
dum2010	-0.00358*** (0.000136)
Constant	-0.845*** (0.0323)
Observations	6,763,162
R-squared	0.981
F-Statistic	4.540e+07
Robust standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

Unemployment Income is the reported unemployment income on the PIT-RC in any tax year;

InLabor equals one if wage income is reported, zero otherwise;

OutLabor equals one if unemployment income is reported, zero otherwise;

Year equals the years an observation is present; and

Dum2010 is a control variable for changes in the program that manifest in tax year 2010 and beyond.

All the variables in the Eligibility linear probability model are significant at the one percent level. The  $R^2$  and F-statistic are extremely high. I attribute the high explanatory and predictive values to the nature of the EITC program; to be eligible each of the variables must be true to some extent. Filing status must not equal married filing separately (dropped from the function to avoid a dummy variable trap); income sources should be non-negative values, with wage income a necessary condition for eligibility; and wage income is indicative of being employed.

The coefficients of the linear probability model may be interpreted as marginal probabilities; positive coefficients increase the likelihood while negative coefficients decrease it. Filing status coefficients are positive and significant, representing the increased likelihood of eligibility relative to observations filing Married filing Separate. Income source coefficients are negative and significant; as income rises, eligibility thresholds are exceeded, and benefits are diminished.

The coefficients on year and post-2009 are significant, but opposite signs. Additionally, the value is very close to zero. The intuition is that time, for eligibility, is immaterial. Annual inflation adjustments to the eligibility criteria were well-established prior to this period of study. The annual adjustments for the study period are illustrated in **Table 1**.

My estimation model for uptake of the Earned Income Tax Credit is:

$$EITCuptake_i =$$

$$\begin{aligned} &\beta_0 + \beta_1 SGL_i + \beta_2 MFJ_i + \beta_3 HOH_i + \beta_4 TotQD_i \\ &\quad + \beta_5 FAGI_i + \beta_6 WageIncome_i \\ &\quad + \beta_7 UnemploymentIncome_i \\ &\quad + \beta_8 InLabor_i + \beta_9 OutLabor_i \\ &\quad + \beta_{10} year_i + \gamma_1 Post2009_i + \varepsilon_i \end{aligned}$$

where, EITCuptake is the variable of interest and equals one if treated, zero otherwise, and the independent variables are as enumerated above.

All the variables for Treatment are significant at the one percent level. On average the model explains over 47% of the variation of EITC uptake ( $R^2$ ). The F-statistic indicates that the predictive value of the model is strong. These traits are unsurprising; the data is New Mexico resident tax filers for the eight years of the panel. If the explanatory value and predictive value of the model was weak, I would have significant concerns about the accuracy of the tax data collected. Moreover, the model is constructed on eligibility criteria, and thus we expect these variables to be valid predictors of treatment.

TY2008 - TY2015 Estimation of EITC Uptake	
VARIABLES	LPM-areg
SGL	0.0887*** (0.000811)
MFJ	0.215*** (0.000835)
HOH	0.415*** (0.000907)
TotQD	0.0940*** (0.000191)
fagi	-3.53e-06*** (7.09e-09)
wages	-5.31e-07*** (2.01e-07)
unemployment	-1.02e-05*** (2.47e-07)
InLabor	0.303*** (0.00301)
OutLabor	0.0968*** (0.00188)
year	0.00574*** (8.42e-05)
dum2010	0.0309*** (0.000443)
Constant	-11.52*** (0.169)
Observations	6,763,162
R-squared	0.479
F-Statistic	455472

Robust standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Broadly, the signs of the coefficients are not surprising. Filing status variables are positive and significant. Income sources are negative and significant. Observations predicted as eligible should be treated, and thus Recipients, but for being sorted as a Skeptic.

The coefficients on year and post-2009 are positive and significant. That treatment displays an upward trend is consistent with year-over-year expansion of program eligibility. Income thresholds adjust upward annually, and additional legislative expansion was passed in 2009. Whereas the time variables could not be reasonably interpreted for eligibility, here we see that expansion of the program is positive for treatment.

That unemployment is negative and significant merits discussion. Earned income of at least one dollar is required for treatment; neither unemployment income nor workman's compensation income is considered earned income. Thus, it is not that more unemployment income has a negative effect on treatment, but rather, sustained unemployment is a barrier to earning income. This trait was previously discussed with **Figure 13**.

One noteworthy difference between eligibility and treatment is the sign of the qualifying dependent coefficient. For eligibility the coefficient is negative and significant, indicating that dependents reduce the likelihood of eligibility. However, the value of the coefficient is essentially zero. For treatment the coefficient is positive and significant, increasing the likelihood by approximately 9.4%.

The intuition here is dependents are a barrier to employment. Recall that eligibility and treatment is tied to work. The coefficient of InLabor (employment) is very close to one in the eligibility model; if an observation does not work the likelihood of eligibility is very small. Moreover, EITC is targeted to low-income workers, specifically single women with children. Thus, having qualifying dependents increases the likelihood of treatment if eligible (and

increases the amount of the benefit), but qualifying dependents make it harder to qualify for the program. Because the EITC program is tied to work, logic dictates that the negative coefficient represents a barrier.

My third estimation model examines the Of Interest group (Eligible = 0; Treated = 0; Income < Threshold; Filing Status  $\neq$  Single; Qualifying Dependents > 0). The estimation model to predict being Of Interest is:

$$\begin{aligned} OfInterest_i = & \\ & \beta_0 + \beta_1 SGL_i + \beta_2 MFJ_i + \beta_3 HOH_i + \beta_4 TotQD_i + \beta_5 FAGI_i \\ & + \beta_6 UnemploymentIncome_i + \beta_7 InLabor_i + \beta_8 OutLabor_i \\ & + \beta_9 year_i + \gamma_1 Post2009_i + \varepsilon_i \end{aligned}$$

where, Of Interest is the variable of interest and equals one if sorted, zero otherwise, and the independent variables are as enumerated above. I drop the wage income variable from this model because the mean of wages for Of Interest is zero; in earlier versions of this model the wages variable was not significant.

In this model to characterize Of Interest, all the variables are significant at the one percent level. On average the model explains approximately 15% of the variation of being Of Interest ( $R^2$ ). The F-statistic indicates that the predictive value of the model is strong.

Filing status variables are positive and significant; this is expected. As noted previously, MFS filing status is ineligible for the program and does not meet the criteria to be Of Interest. Filing head of household increases the likelihood of being in Of Interest. This, too, is consistent with the program; in fact, single mothers with children – the target of the EITC program – using the correct filing status, would file head of household. However, that these observations are “Of Interest” indicates they are not being treated even though



they are targeted by the program.

The coefficient on FAGI is negative and significant; as federal adjusted gross income increases, the probability of being Of Interest decreases. While the coefficient is very close to zero, I believe this is a scale issue. FAGI is a continuous variable from -50K to 150K and is dollar denominated. Thus, for approximately each \$10,000 of FAGI, the marginal probability decreases by a little more than one percent. The coefficient on unemployment is positive, although very close to zero, indicating that having unemployment income increases the likelihood of being Of Interest.

The coefficients on the labor market variables are negative and significant. Employment (InLabor) decreases the likelihood of being Of Interest; this is consistent with my hypothesis. However, being unemployed (OutLabor) is also negative. This result is counterintuitive. The coefficient on post-2009 is negative, indicating that the expansion of the program decreases the likelihood of being Of Interest.

The intuition of the coefficient on being unemployed (OutLabor) is based on my understanding of the unemployment regime. If an observation is receiving unemployment, then they are actively seeking work and considered part of the labor force. If an observation is not receiving unemployment income and does not report wages, it is likely that they have been unemployed longer than 26 weeks. This circumstance was identified in the work by

TY2008 - TY2015 Characteristics of Interest Group	
VARIABLES	LPM-areg
SGL	0.0176*** (0.000243)
MFJ	0.0407*** (0.000281)
HOH	0.0583*** (0.000380)
TotQD	0.0330*** (0.000122)
fagi	-1.08e-06*** (2.71e-09)
unemployment	6.84e-06*** (1.79e-07)
InLabor	-0.0918*** (0.000191)
OutLabor	-0.0176*** (0.000938)
year	0.000163*** (4.44e-05)
dum2010	-0.0119*** (0.000242)
Constant	-0.276*** (0.0891)
Observations	6,763,162
R-squared	0.150
F-Statistic	25397
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1	

Maggie Jones as particularly problematic, and it is indicative of long-term unemployment. The results of this model related to unemployment seem to be contradictory. My explanation is thus: if an observation has some amount of unemployment income, then during the tax year they were part of the labor force participation rate and therefore looking for work. However, prolonged unemployment, overall, will increase the probability that an observation becomes Of Interest.

Finally, the coefficient on total qualifying dependents is positive and significant. When we regress the total number of qualifying dependents on being Of Interest, we find that each additional dependent increases the probability of being Of Interest by 3.3%. This coefficient is significant at the one percent level. As noted previously the coefficient on dependents is negative and significant for eligibility, and positive and significant for treatment. These findings are interesting and noteworthy.

A plausible interpretation for these differences is that dependents are a barrier to employment for low income workers. The negative coefficient on dependents for eligibility can be interpreted as dependents are a barrier to earned income, a necessary condition for eligibility. Similarly, the positive coefficient on dependents for Of Interest can be interpreted as dependents are a barrier to earned income. In contrast, the positive coefficient for dependents for Treatment is an indication that if an observation is able to earn income in New Mexico, then each additional dependent increases the threshold for eligibility.

**Figure 14** is a series of two-way scatter graphs illustrating the proportion of observations that have zero, one, two, and three or more dependents. The lines of each graph contrast Of Interest to all other observations. Recall that observations with zero

qualifying dependents were

Figure 14 - Qualifying Dependents

sorted to the Omitted

Information Group (OIG)

so that the Of Interest group

would not be overstated;

thus, no Of Interest

observation has zero

dependents. However, in

each of the other panels

there are proportionately more Of Interest observations with dependents than non-Of

Interest observations. Additionally, the number of observations having three or more

qualifying dependents increases approximately five percent amongst Of Interest

observations at the same time the New Mexico unemployment rate is growing. **Figure 15** is

a two-way scatter graph illustrating the

Figure 15 - Total Qualifying Dependents

mean number of qualifying dependents

reported by the Of Interest group and all

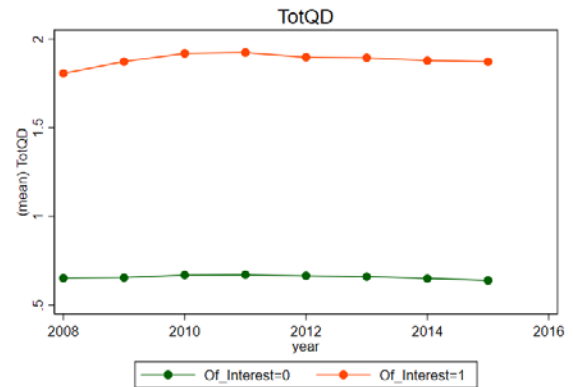
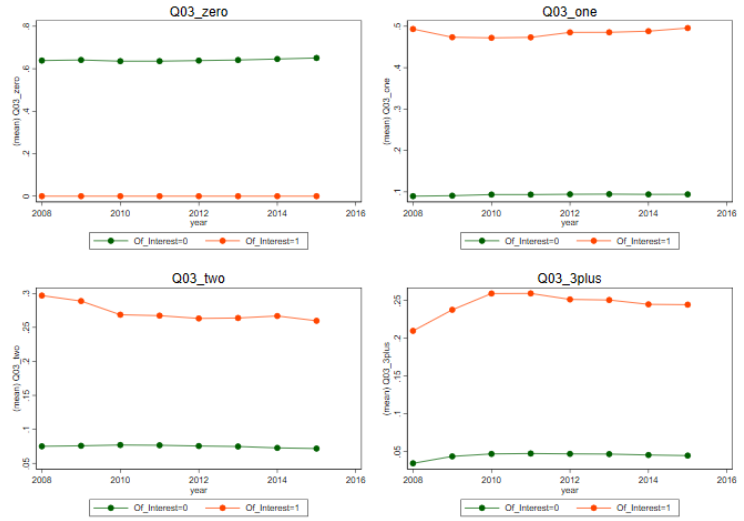
others. The intuition that more qualifying

dependents is a barrier to eligibility is

supported graphically. In each year,

observations Of Interest, who do not report

earned income, have more qualifying dependents.



## 5. CONCLUSIONS

This paper endeavors to understand the circumstances that are barriers to EITC eligibility and treatment. Using New Mexico personal income tax data that spans eight years of the post Great Recession period from 2008 through 2015, I examined how eligibility criteria predict receipt of the Earned Income Tax Credit. Additionally, I look at the same criteria to understand why one may be ineligible and untreated. I created six categories based on eligibility and treatment to examine these characteristics.

Recipients, those who are eligible and receive treatment, are the group that represents the program's success. The EITC is responsible for significantly lowering the poverty rate of its recipients. For households below the poverty line, the EITC fills 31% of the gap between their household federal adjusted gross income and the poverty line.

Skeptics, those who are eligible but do not receive the EITC, represent a group that would benefit from the credit, but they are likely unaware of the program. The IRS, in conjunction with local philanthropic organizations, endeavors to create awareness through various outreach programs. In 2016 a group of researchers from Carnegie Mellon University partnered with the IRS to study the issue. In addition to a lack of awareness, program complexity, the stigma of qualifications, and the fear of audit were reasons eligible tax filers did not receive treatment.

In this study, the number of Benefactives, those who are not eligible but receive treatment, is likely overstated. Due to an omitted information issue, a significant portion of this group would otherwise be sorted as Recipients. However, some errors or fraud exists. The IRS estimates that between 21% and 26% of EITC claims are paid in error. Some of the errors are unintentional, but some claims are intentional disregard of the law.

Ascendants, those who are neither eligible nor treated and enjoy economic success, are likely understated due to an omitted information problem. In this case, the missing information precludes properly identifying economic success. However, if an observation has federal adjusted gross income greater than the EITC thresholds, then they are properly excluded from the Of Interest group.

The Omitted Information Group was created to minimize the likelihood that the Of Interest group is overstated. Observations sorted here would be distributed to other research groups but for the missing information. Additionally, they include observations that are truly ineligible and not treated but are not observations to be sorted as Of Interest. These observations include dependents of other filers, who filed a return, but regardless of economic circumstances, would not be eligible for the EITC.

Finally, Of Interest, those who are neither eligible nor treated and report federal adjusted gross income less than the EITC thresholds, are the target of this research. The empirical models correctly predict EITC eligibility at 59.1%; predicts uptake at 51.1%; and predicts being Of Interest at 57.3%. This group represents individuals who do not report earned income. During the study period, New Mexico unemployment was significantly higher than the pre-Great Recession period. Thus, it is likely this group consists of individuals who desired work but could not find it.

This study suggests that a possible barrier to finding employment is having dependents. While having dependents increases the value of the EITC for those that are eligible, the empirical model for eligibility suggests that having qualifying dependents decreases the likelihood of eligibility. This is an interesting finding. A perennial debate surrounding EITC considers further expansion versus increasing the minimum wage. However, if an individual

is willing to work, but cannot find work, the EITC is of little value. In 2016 several legislative initiatives in New Mexico considered expanding the state-level equivalent of EITC: the Working Family Tax Credit (WFTC). At that time, legislative proposals considered doubling the expenditure on the WFTC from \$50 million to \$100 million.

While this type of program expansion will supplement the incomes of the eligible, it does little to address a possible barrier to work. Approximately 3.5% of the data set – a little more than 30,000 households – were identified as Of Interest during the study period. Finding work in New Mexico is hard. Finding work that pays a livable wage in New Mexico is harder. It is indisputable that supplementing wages with EITC has value for low-income, low-wage workers. Thus, public investments that remove barriers to finding work would also reduce poverty.

## REFERENCES

- Allison, Paul, 2018. “For Causal Analysis of Competing Risks, Don’t Use Fine & Gray’s Subdistribution Method.” Statistical Horizons. <https://statisticalhorizons.com>
- Bitler, M., Hoynes, H., and Kuka, E. “The EITC Does Not Automatically Stabilize Income for All in a Recession.” Policy Brief, Center for Poverty Research, Volume 2, Number 1. Center for Poverty Research, University of California, Davis.
- Bitler, M., Hoynes, H., Kuka, E., 2014. Do In-Work Tax Credits Serve as a Safety Net? Tech. rep., National Bureau of Economic Research.
- Bitler, M. P., Hoynes, H. W., 2010. The State of the Social Safety Net in the Post–Welfare Reform Era. Brookings Papers on Economic Activity.
- Chetty, Raj and E. Saez “Teaching the Tax Code: Earnings Responses to an Experiment with EITC Recipients.” NBER Working Paper, April 2009.
- Fine, J. and R. Gray. 1999. A proportional hazards model for the subdistribution of a competing risk. *Journal of the American Statistical Association*. 94: 496–509.
- Horowitz, J.B. “Income mobility and the earned income tax credit.” *Economic Inquiry*, 40 (3), 2002, 334-347.
- Jones, M. R. “The EITC over the Great Recession: Who benefited?” October 1, 2015. Center for Administrative Records Research and Application, U.S. Census Bureau.
- Jones, M.R. “Changes in EITC eligibility and participation: 2005-2009.” *IRS Research Bulletin*, 2013.
- Saez, Emmanuel. “Do Taxpayers Bunch at Kink Points?” August 2010. *American Economic Journal: Economic Policy* 2. 180-212.
- Williams, R., Maag, E. “The recession and the Earned Income Tax Credit.” Tech. rep., 2008. The Urban Institute.
- [www.eitc.irs.gov](http://www.eitc.irs.gov)