

Effective Policy for Reducing Inequality: The Earned Income Tax Credit and the Distribution of Income

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Overview

- The U.S. social safety net for lower income families has shifted to one based on *in-work* assistance (welfare reform, EITC expansion)
- Static calculations show that the EITC (and CTC) removes 5 million children from poverty making the EITC the largest anti-poverty program for children in the U.S.
- While many prior papers have estimated the effects of the EITC on employment and labor supply, we make an important contribution by estimating the effects of the credit on the distribution of income
- Because of the work promoting nature of the credit, our work shows that the static anti-poverty calculations represent significant underestimates of the full poverty reducing effects of the program.

Roadmap

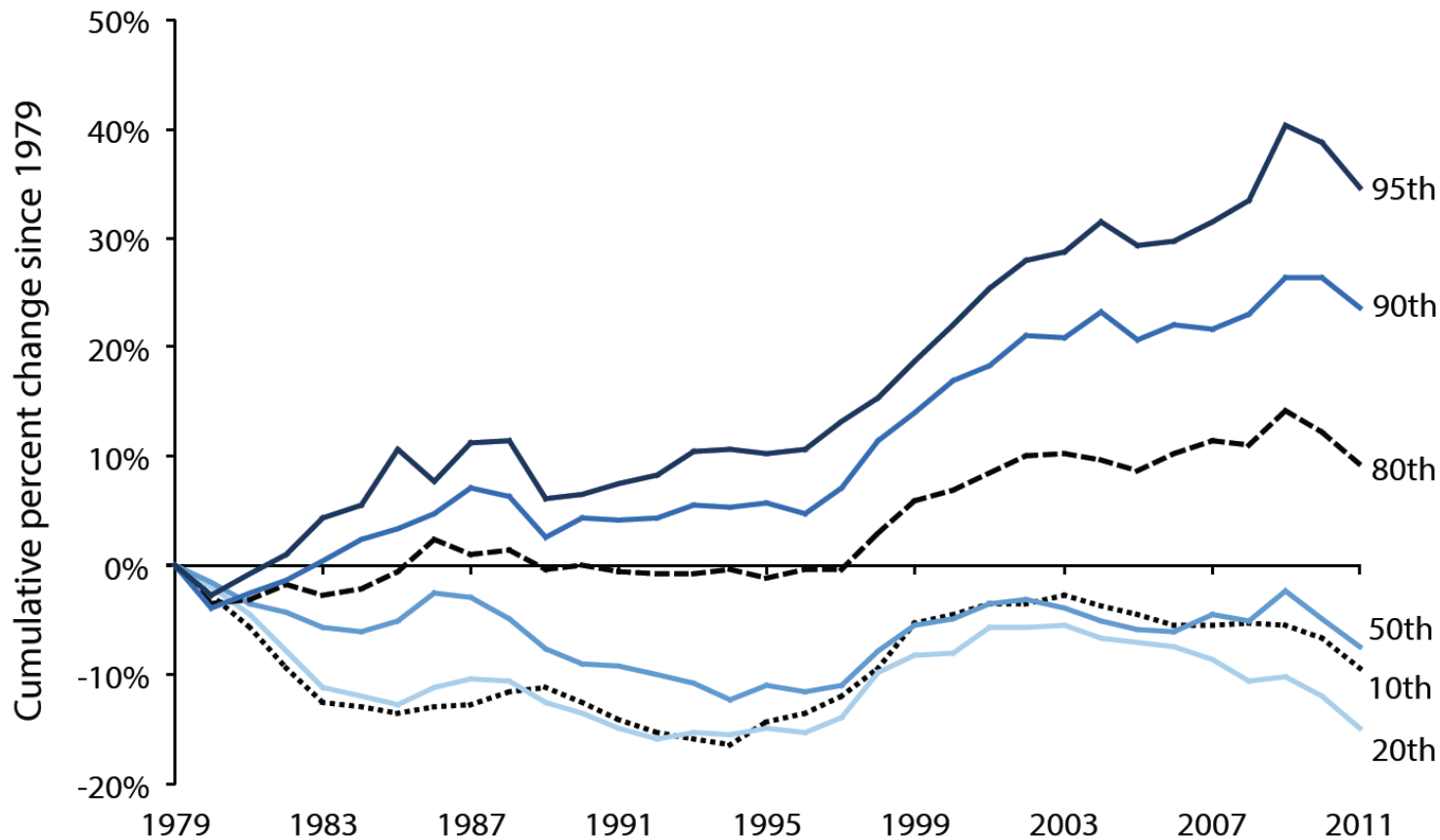
1. Background, Motivation and the EITC
2. Incentive effects of the EITC
3. Prior evidence, our sample and approach
4. Results: Effects of the EITC on employment and the distribution of income
5. Conclusion

Motivation 1:

The labor market, earnings, and family income

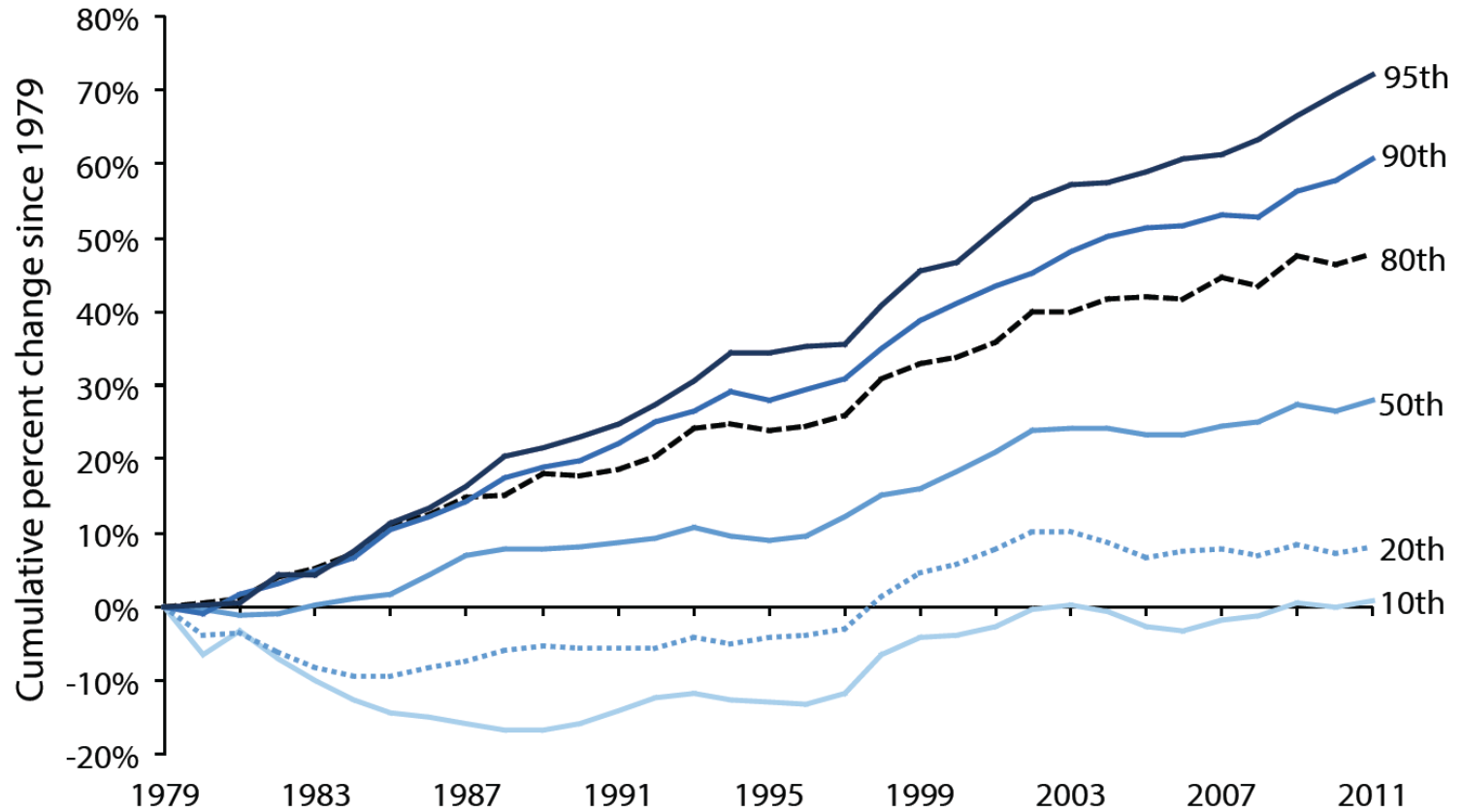
- Since the mid 1970s, there has been little gain in wages for less skilled workers, especially for men
- Additionally, labor force participation rates are declining for prime age men, and more recently, prime age women
- The implication is stagnant family incomes for the bottom quintile of Americans

Figure 4C Cumulative change in real hourly wages of men, by wage percentile, 1979–2011



Source: Authors' analysis of Current Population Survey Outgoing Rotation Group microdata

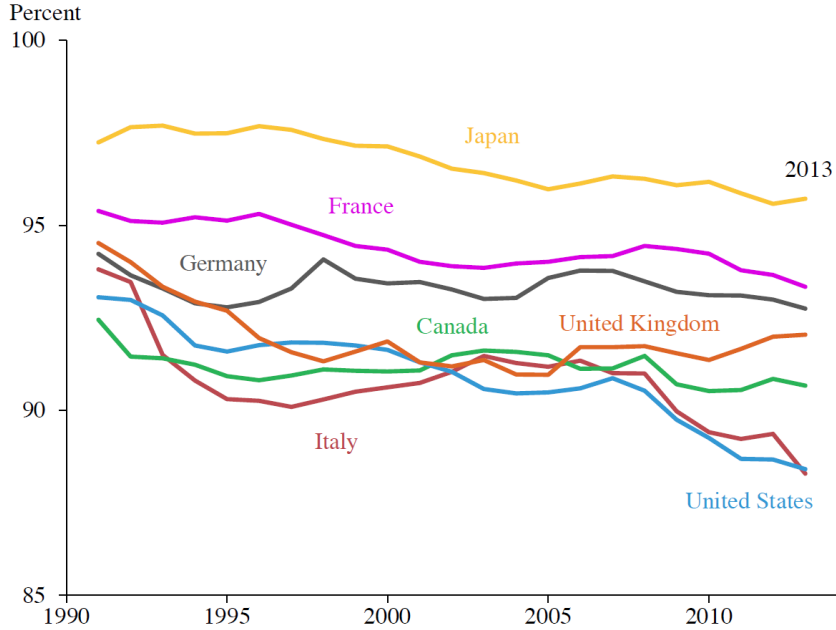
Figure 4D Cumulative change in real hourly wages of women, by wage percentile, 1979–2011



Source: Authors' analysis of Current Population Survey Outgoing Rotation Group microdata

Figure 1-9

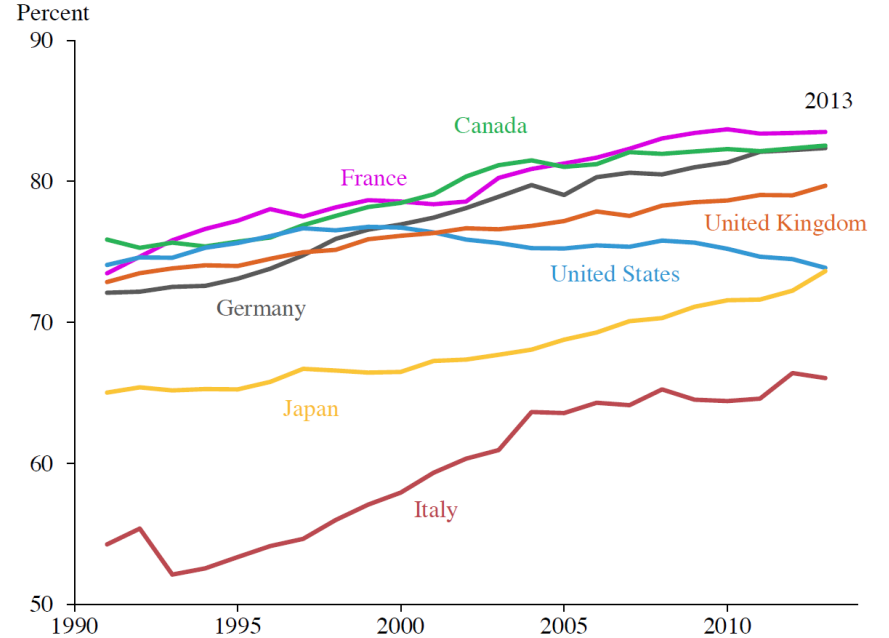
Prime-Age Male Labor Force Participation Rates, 1991–2013



Source: Organisation for Economic Co-operation and Development.

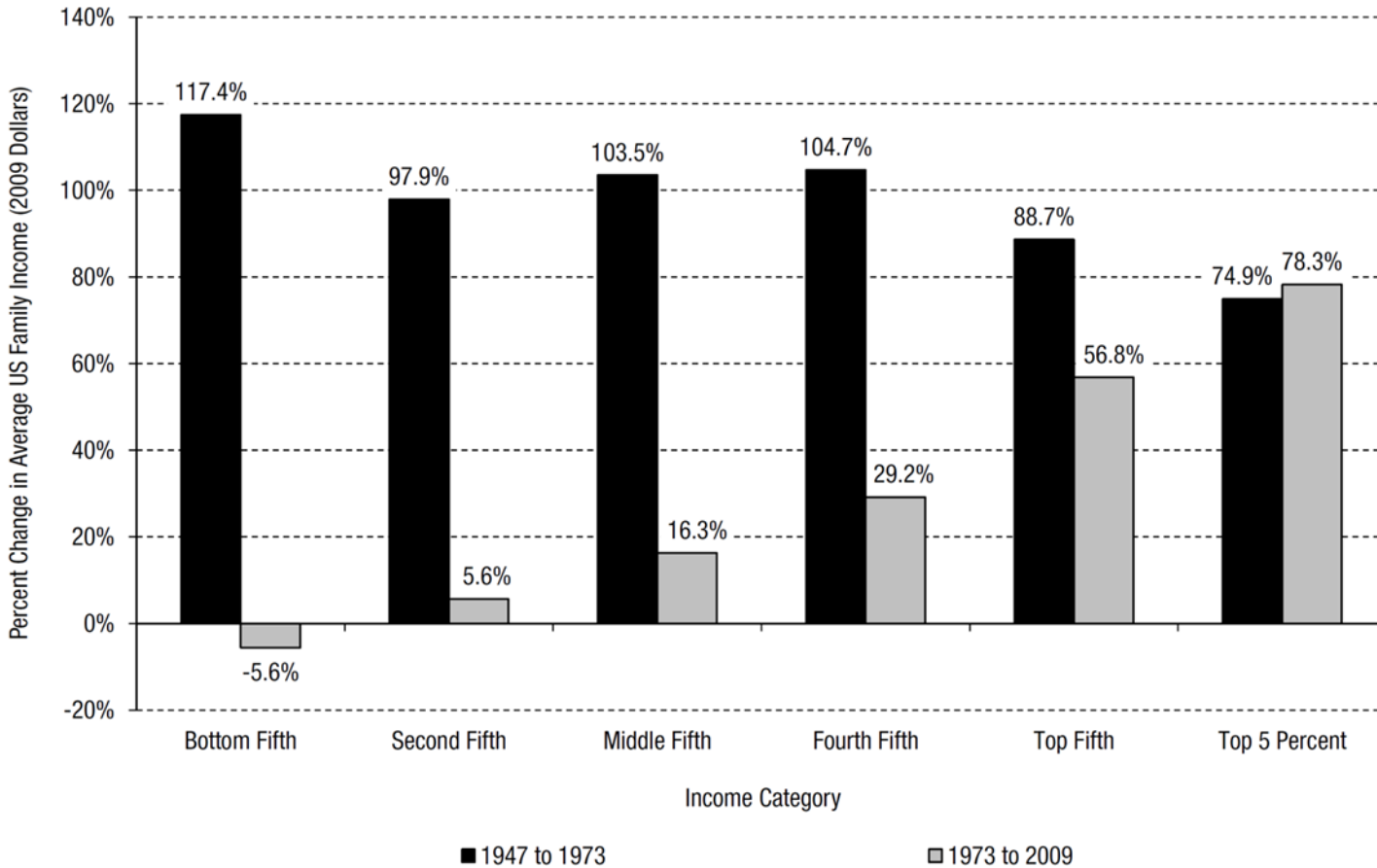
Figure 1-10

Prime-Age Female Labor Force Participation Rates, 1991–2013



Source: Organisation for Economic Co-operation and Development.

Broadly Shared Prosperity Ended in the Early 1970s, and a Generation of Widening Inequality Began



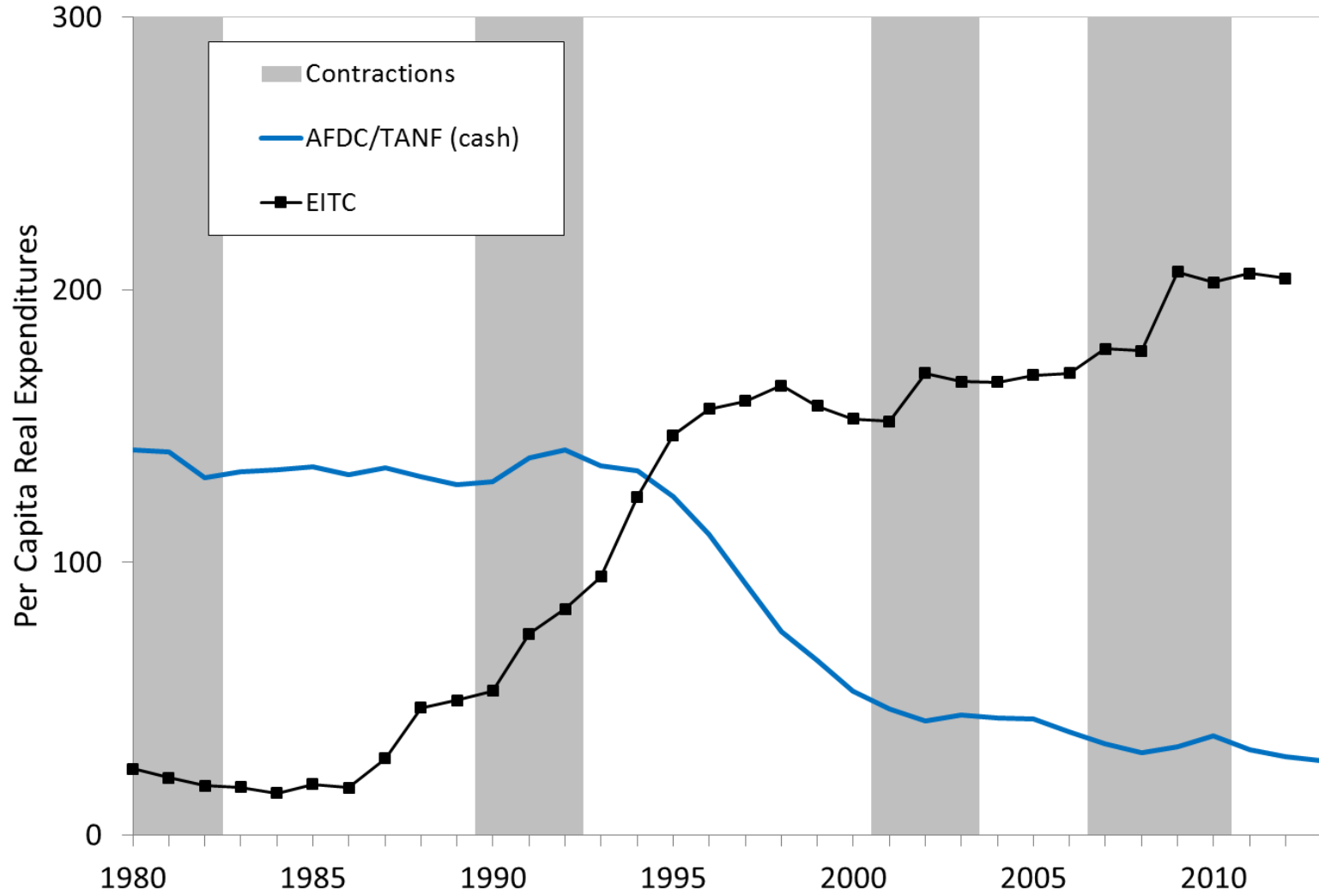
- Given these trends, and against the backdrop of persistence of college premiums (Autor 2014) and increasing inequality (Piketty and Saez 2003), there is renewed interest in policies aimed at reducing inequality and increasing income of the less advantaged population.
- The EITC figures in prominently here: main *post-market* policy that affects the twin concerns of low employment and stagnant income

Motivation 2: Changes in the Social Safety Net

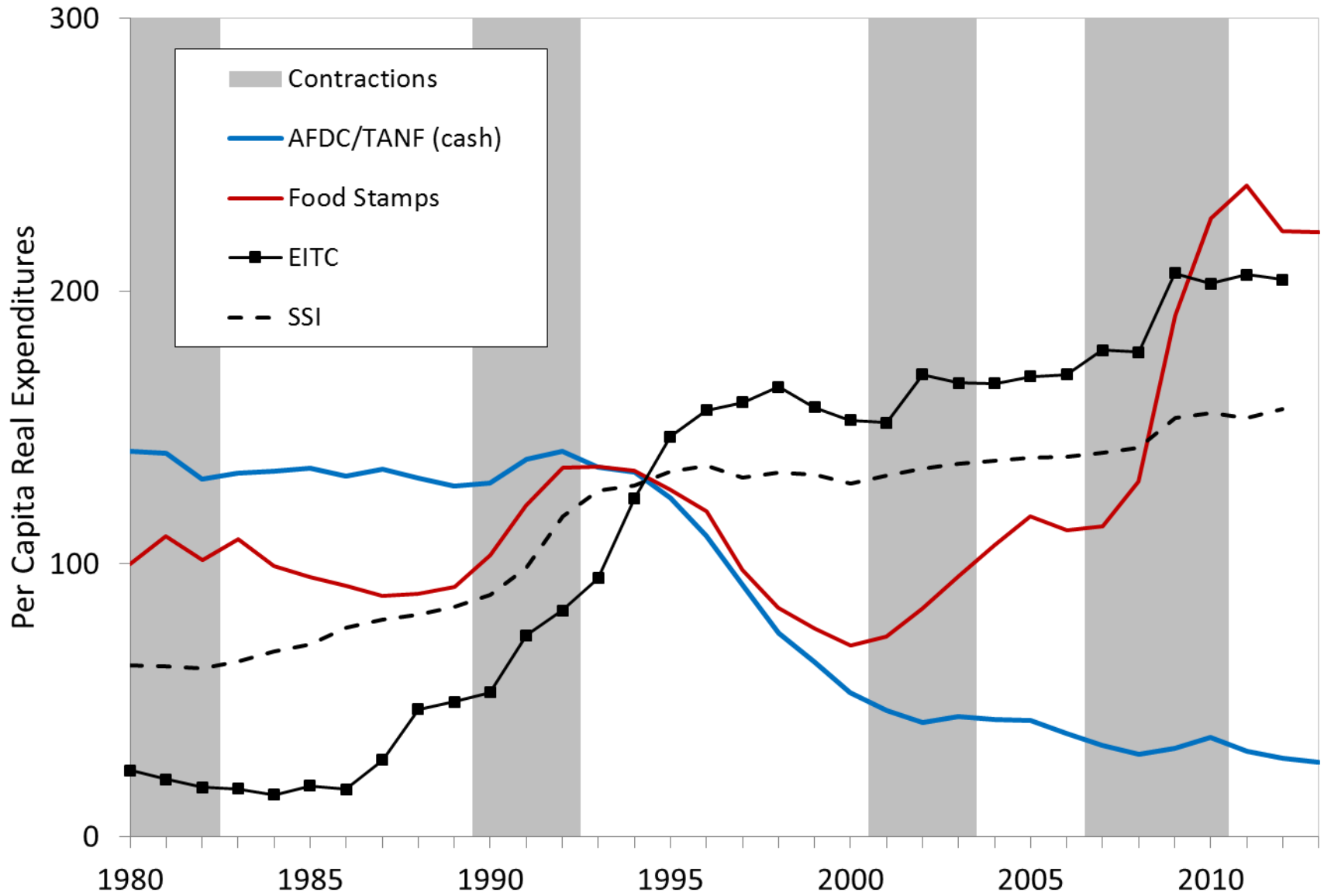
The U.S. has experienced a tremendous change in the social safety net for low income families with children over the past 20 years:

- Decline in the *out-of-work* safety net (1996 welfare reform)
- Rise of the *in-work* safety net (the EITC)
 - The EITC is received by 28 million tax filing units, almost 20 percent of all tax filers and 44 percent of filers with children receive the EITC.

Per Capita Expenditures on the Social Safety Net (2012 dollars)



Per Capita Expenditures on the Social Safety Net (2012 dollars)

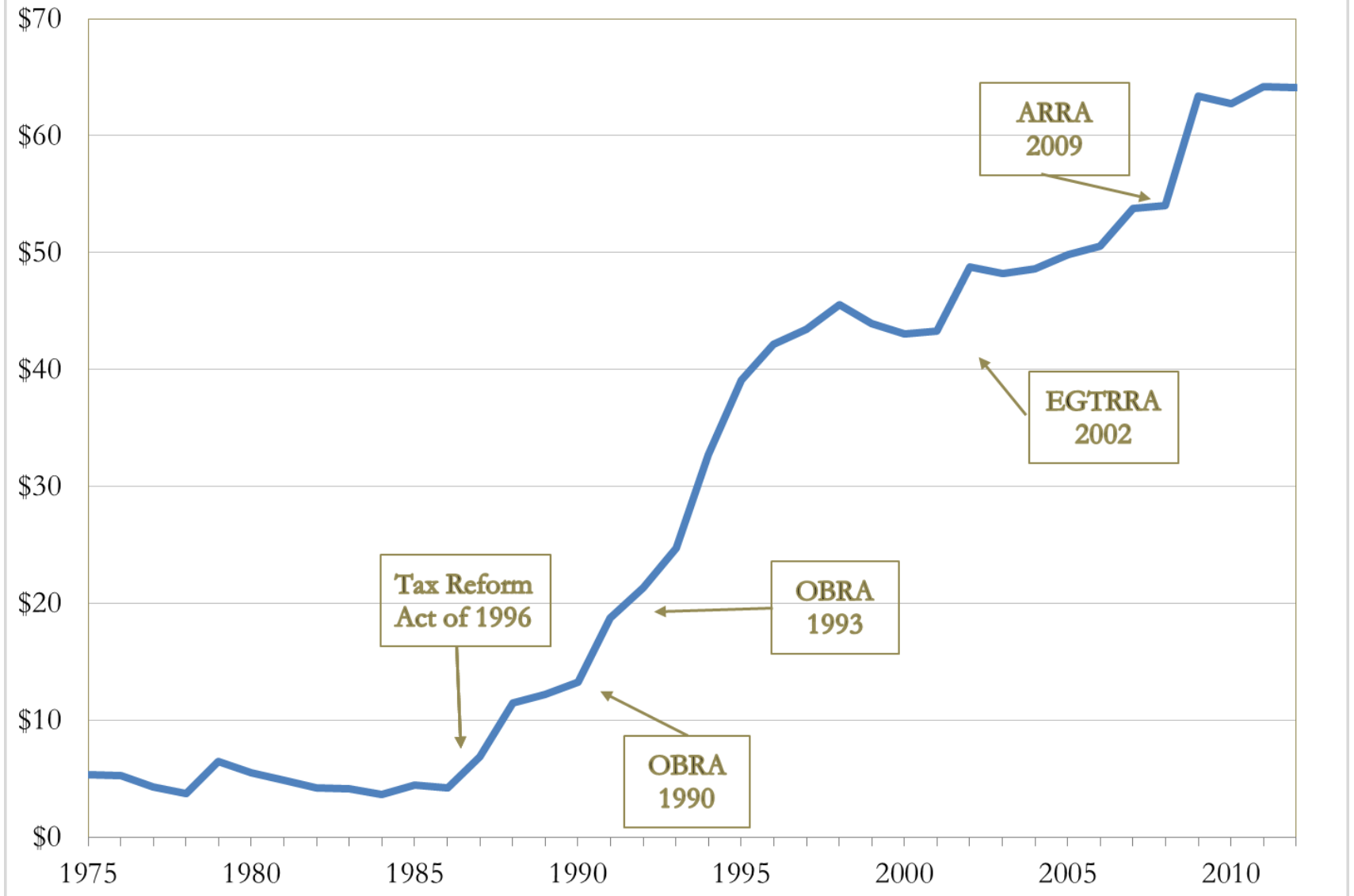


Earned Income Tax Credit

- In-work, tax based assistance
- Refundable tax credit for low income families
- EITC has been expanded through tax acts in 1986, 1990, and 1993 (and smaller expansions in 2001, 2009)
- Must have earned income to be eligible
- Credit varies by number of children (small credit for childless), earnings (and AGI)

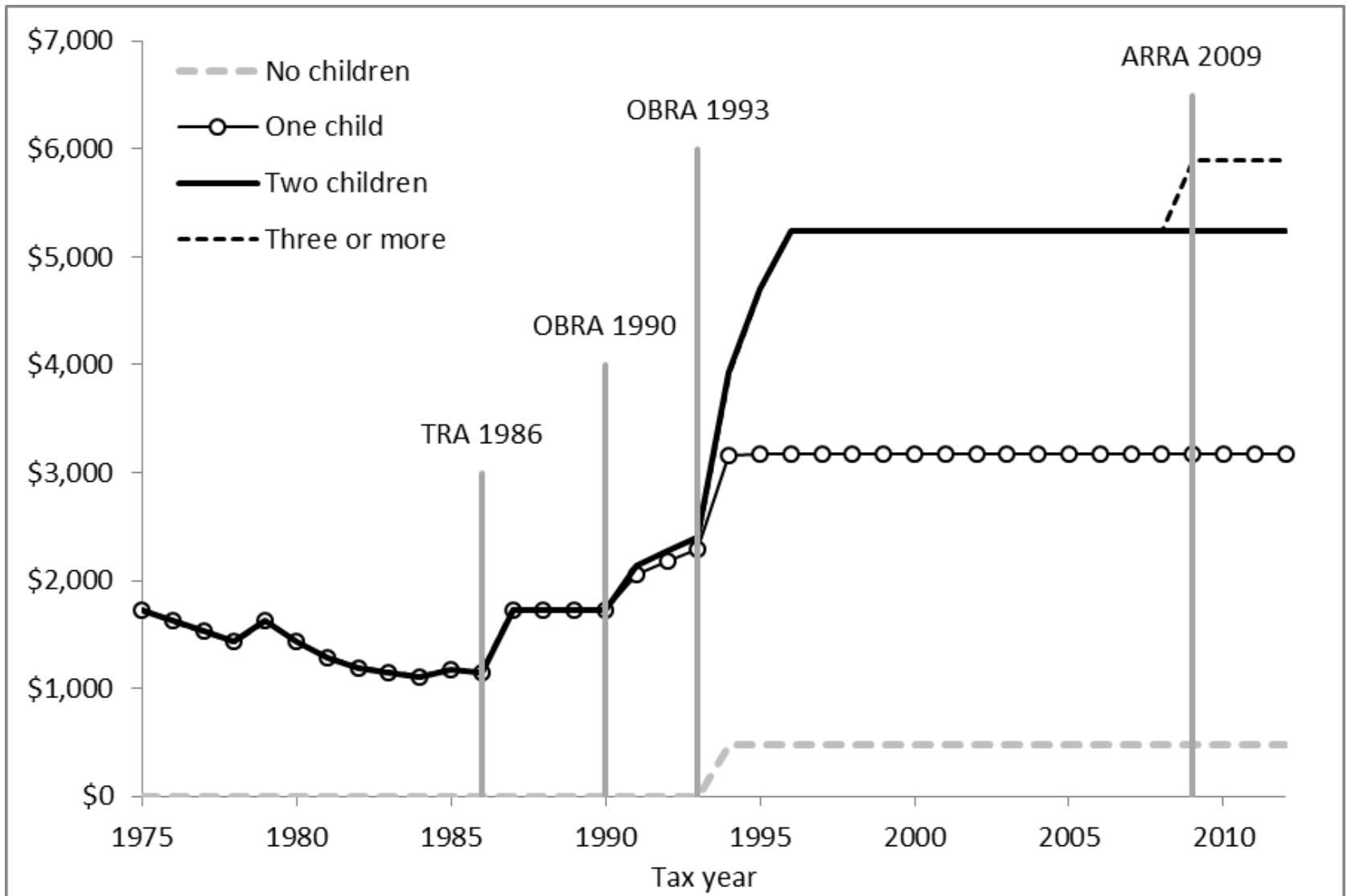
	% Dist. of Recipients	% Dist. of Expenditure
Single, with children	58.7%	74.1%
Married, with children	19.4%	23.2%
No Children	21.9%	2.7%

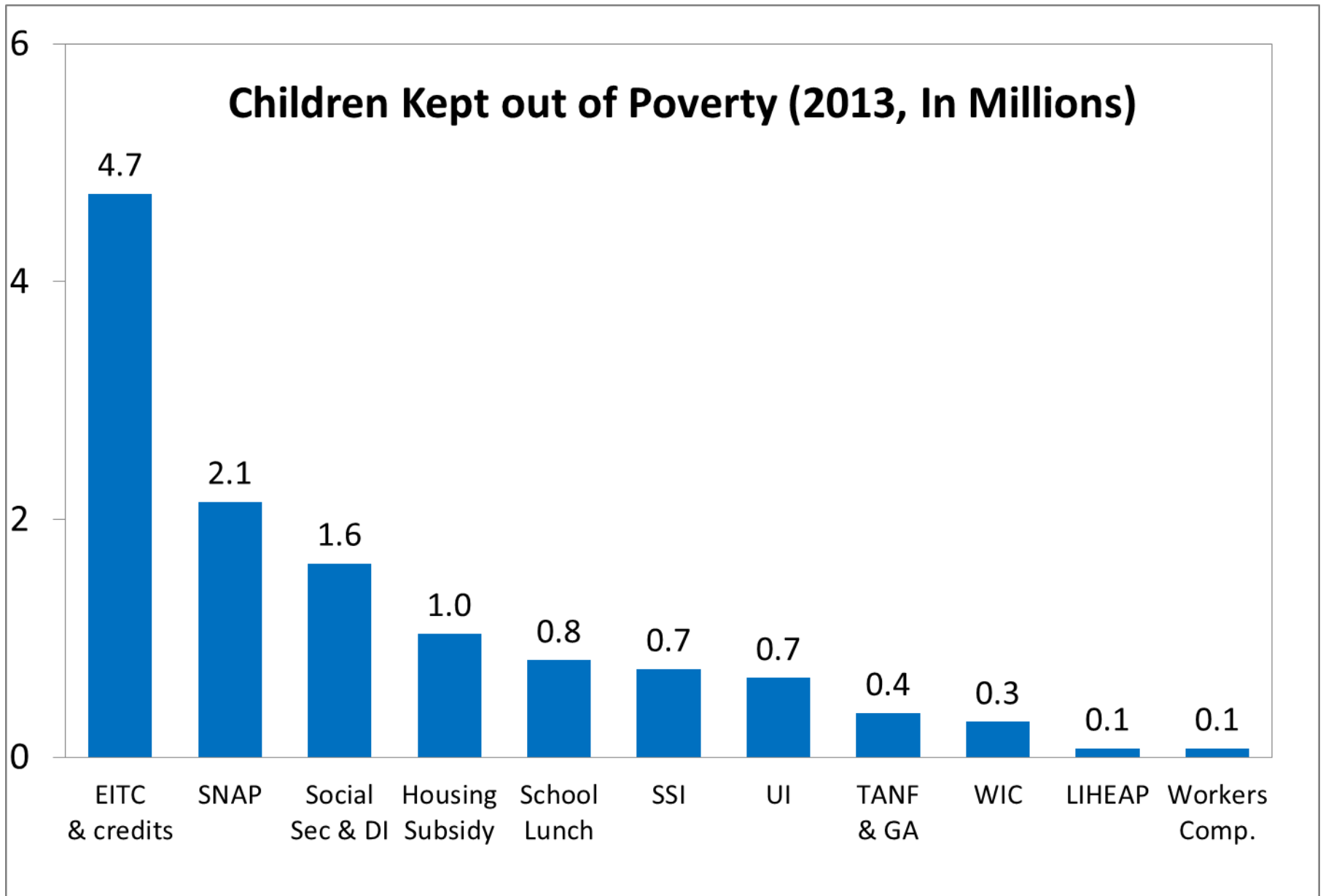
EITC, Billions of 2012 Dollars



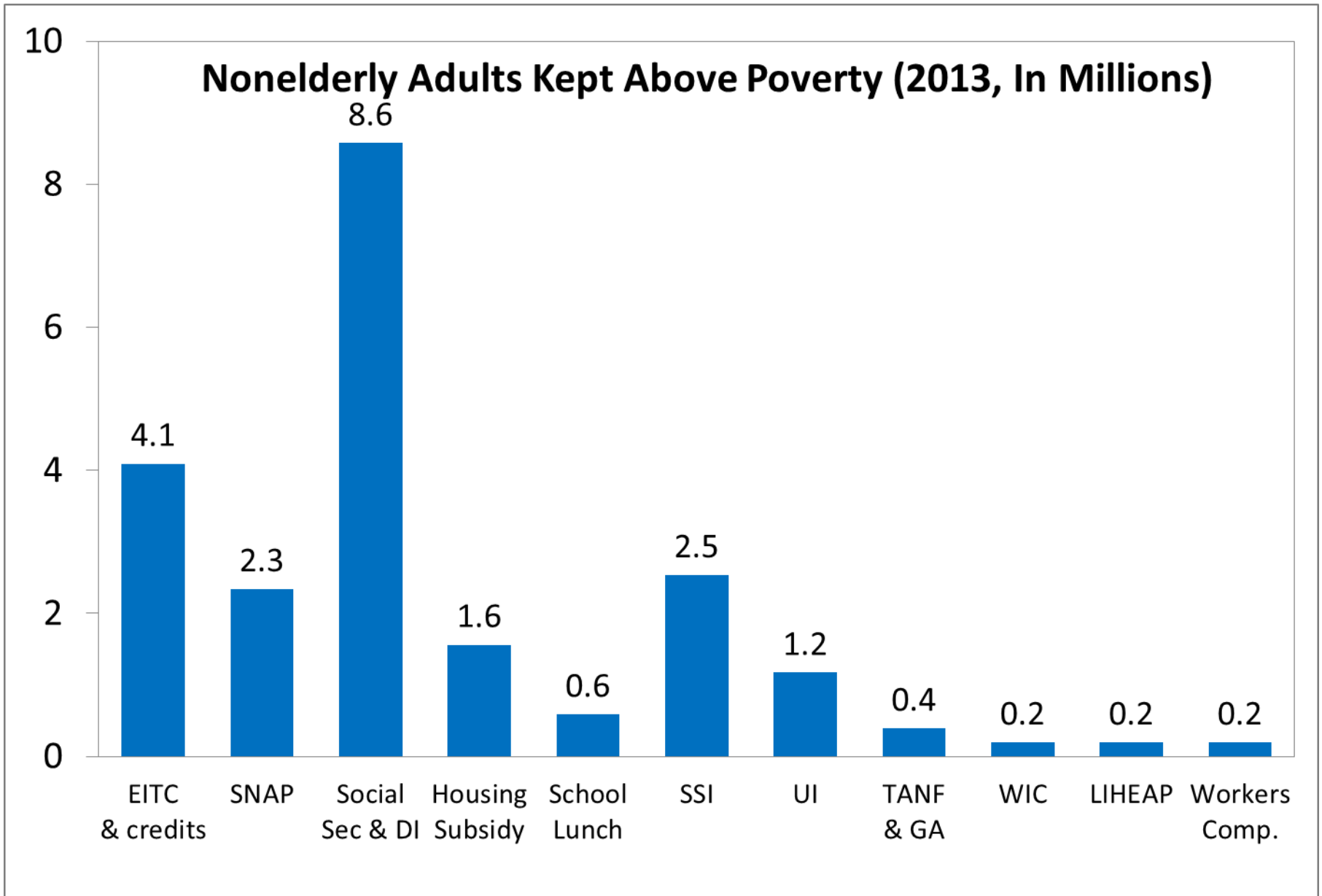
Source: Tax Policy Center.

Maximum benefits by number of children (2012 \$)





Source: Calculations based on *Supplemental Poverty Measure, 2013* (Kathleen Short), U.S. Department of Census, Current Population Report P60-251.



Source: Calculations based on *Supplemental Poverty Measure, 2013* (Kathleen Short), U.S. Department of Census, Current Population Report P60-251.

In-work benefits are prominent in other settings

- More than half of U.S. states offer “add on” EITCs
- A total of 17 OECD countries have in-work credits
 - Early adopters: UK (1971), US (1975), Ireland (1984)
 - Past 15 years has seen many countries adopting these policies
 - Particularly relevant in the European context is the interest in counteracting the work disincentives in social assistance and unemployment benefit programs

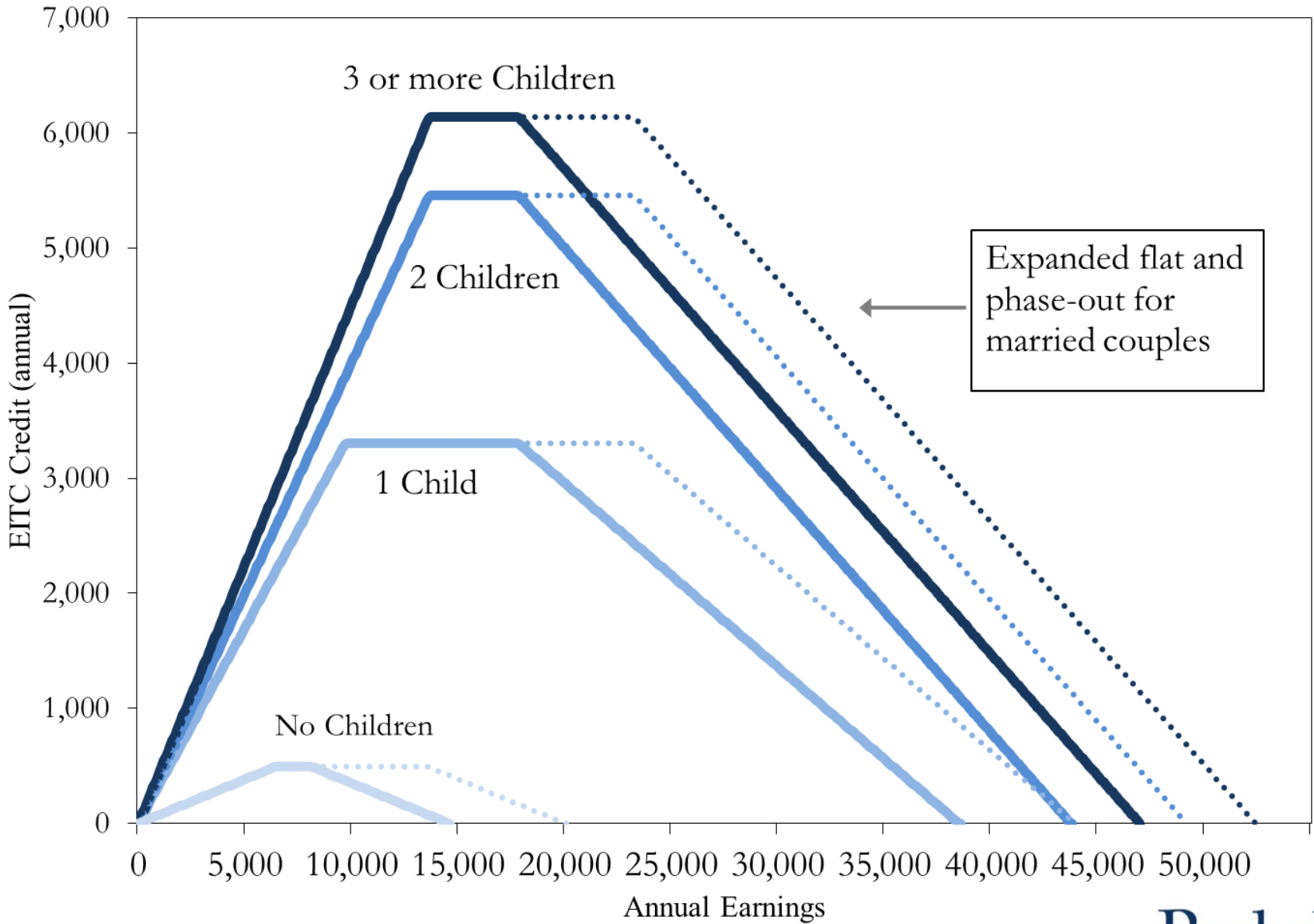
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EITC Eligibility and Benefits

- EITC Eligibility
 - All family types are eligible
 - Primarily provides benefits for those with children
 - Must have earned income; based on family income
- EITC Benefits
 - Phase-in (constant subsidy rate on earnings)
 - Flat
 - Phase-out (constant benefit reduction rate)
- The phase-out rate is relatively low (21%) compared to social assistance benefit reduction rates
- The phase-in rate can get quite high (> 40%)

EITC Schedule 2014



Labor supply incentives

- Due to the conditioning on earnings, the EITC is predicted to increase employment (extensive margin)
- Earnings conditional on work is ambiguous but on net would be expected to decrease (negative in flat and phase-out, opposing income and substitution effects in phase-in)
 - The intensive margin labor supply incentives are muted due to the (relatively) low phase-out tax rate
- Labor supply predictions are more complicated for married couples; secondary earners may reduce labor supply due to new income transfer to primary earner (both income and substitution effects)

The effect of the EITC on income

- The EITC can affect after tax and transfer (ATT) income through multiple channels

Static
Effect

– *Credit effect*: direct EITC payments

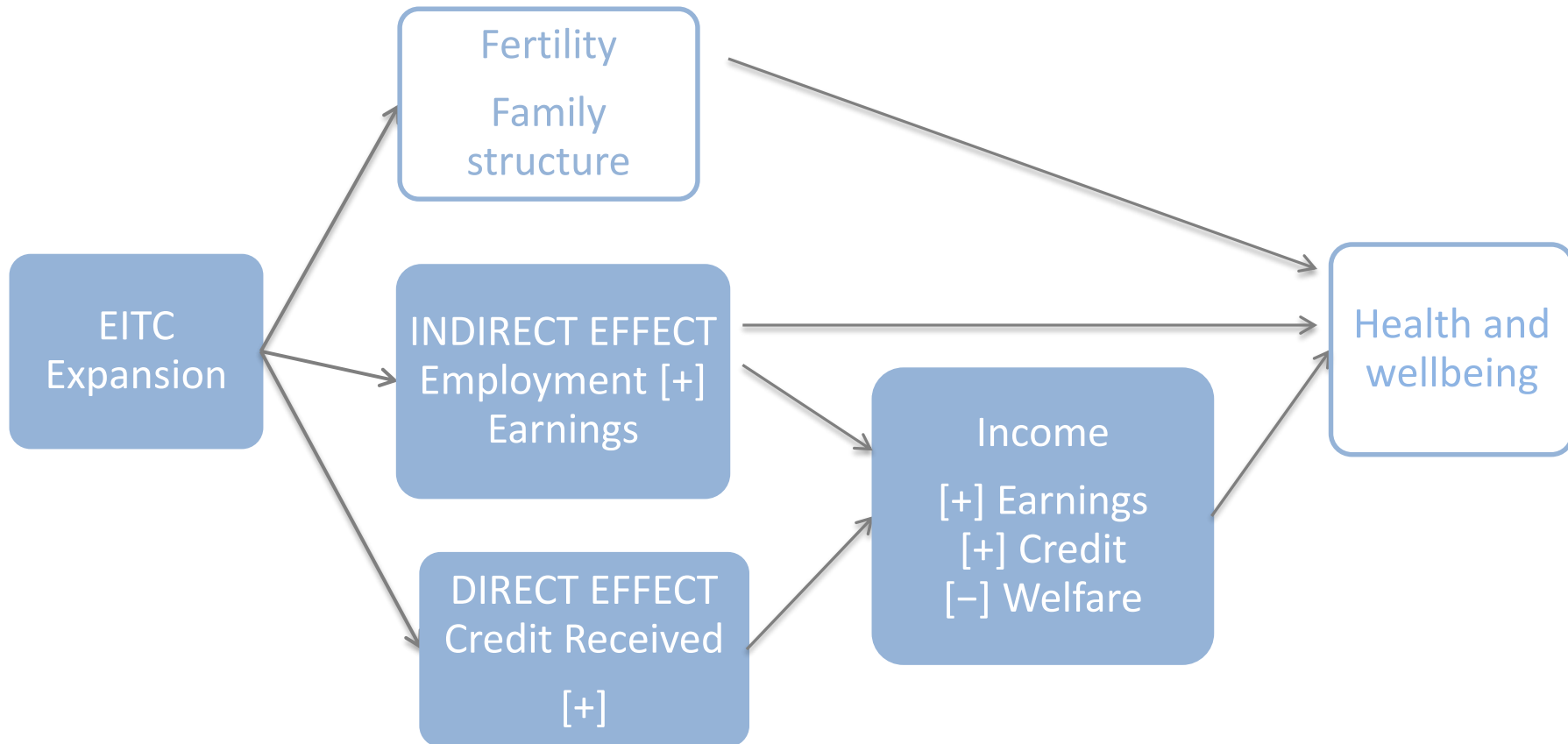
Dynamic
Effects

– *Earnings effect*: extensive margin leads to increase in earnings

– *Income adjustment effect*: offsetting reduction in public assistance (SNAP, TANF) as earnings increases

- We expect little effect of the credit on the very poorest (since there is less connection to the labor market) or above 200% of poverty (beyond the EITC eligibility point)
- Given the prominence of this policy and the interest in inequality, it is important to know how the credit affects the distribution of income

EITC, Employment, Income and Well-being



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Prior evidence on labor supply

- For single mothers, consistent evidence that an expansion in the EITC leads to increased employment (Eissa and Liebman QJE 1996, Meyer and Rosenbaum QJE 2001, Grogger RESTAT)
- For married couples, there is little effect on men but women reduce labor supply modestly (Eissa and Hoynes 2004)
- Little evidence on the intensive margin, though some studies show that workers adjust to maximize the credit along the phase-in region (Chetty, Friedman and Saez 2013, Saez 2010, Chetty and Saez 2013).
 - Unclear if this is a reporting response or intensive margin response in real economic activity

Prior evidence on the EITC and the distribution of income

- There is limited work on the effects of the EITC on the distribution of income
- Several studies take a static approach and measure the direct effects of the EITC (Short 2014, Meyer 2010, Liebman 1998).
- Neumark and Wascher (2000) leverage variation in state EITCs and find that the credit increases the likelihood that earnings rise above poverty. Bollinger et al (2009) and Gunderson and Ziliak (2004) examine effects on poverty as part of a broader analysis of welfare reform, business cycles and poverty.

Our contribution

- Our paper is the first to comprehensively examine the effect of the federal EITC on the distribution of income.
- Our approach allows for the measurement of the direct and indirect effects of the EITC, taking into account behavioral responses on labor supply, other program participation
- We also update the literature on labor supply, using event study models
- In our work we focus on single mothers because they account for the vast majority of the costs of the program.
- Given the importance of the program for lower income families, it is surprising that we have little evidence on the full antipoverty effects of the program.

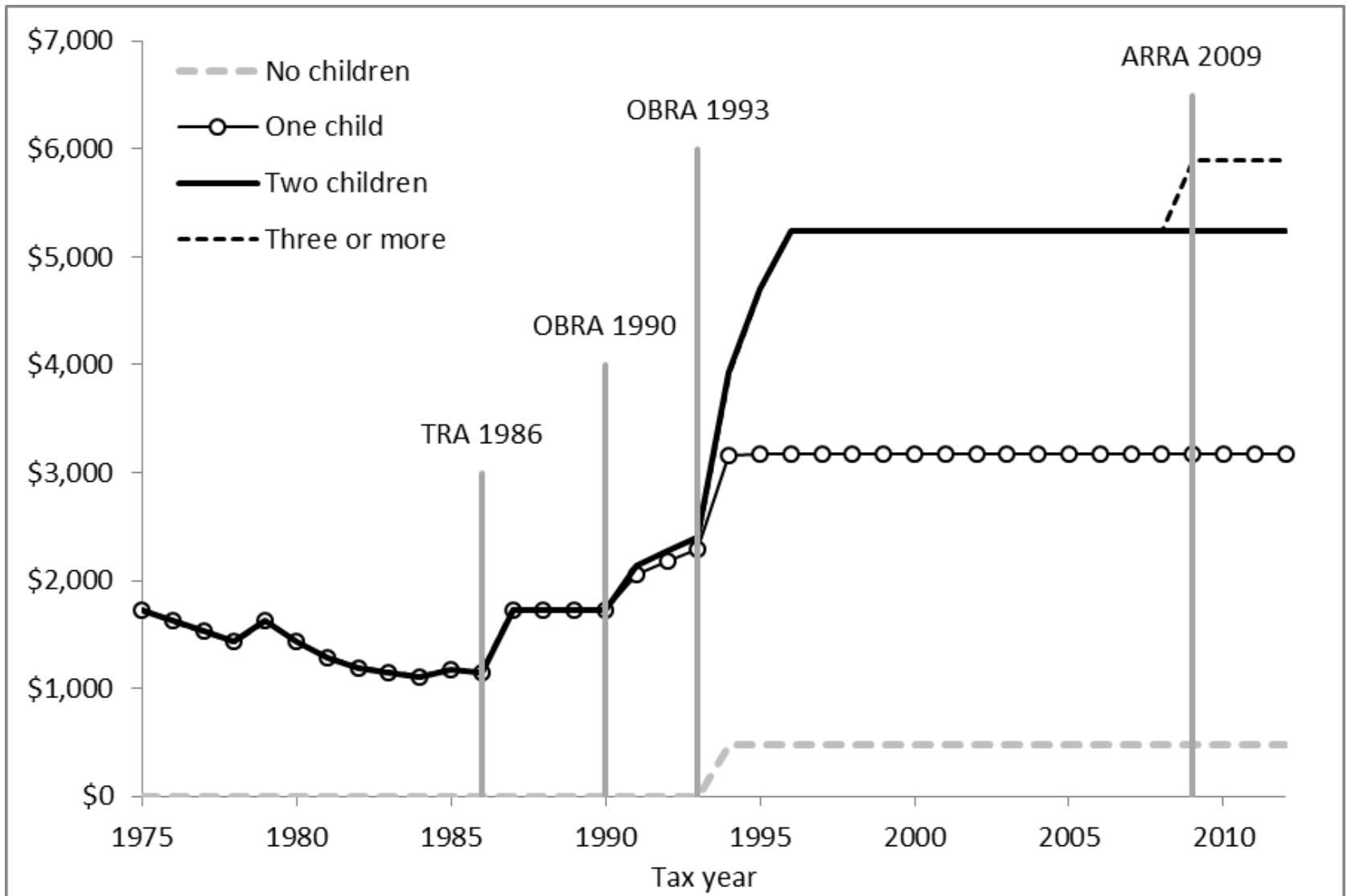
Sample and Data

- CPS March 1985-2014, covering annual earnings and income for prior calendar year
- Sample includes single women 24-48, not ill, disabled or going to school, with an education level of some college or below
- Outcome variables
 - Employment
 - Income to poverty: we use a measure of after-tax and transfer income and the official poverty thresholds (Bitler and Hoynes 2014)
 - Income measure comprehensive includes in-kind benefits and taxes
- TAXSIM used to for taxes
- Administrative tax data not sufficient here since we need to observe people who are both in and out of the labor market (and tax universe) since this is the margin that the policy affects.

Empirical methods

- We present two related estimation strategies in the paper:
 - Difference-in-difference and event study of OBRA93, the largest EITC expansion (analyzes years 1991-1998)
 - Parametric DD leveraging expansions throughout the period 1984-2013 (uses simulated EITC to parameterize generosity)
 - For both approaches, identification comes from differences in the generosity of the credit across family size (number of children) and year (tax reform)

Maximum benefits by number of children (2012 \$)



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Methods: OBRA 93 Difference-in-Difference

$$y_{it} = \alpha + \beta(\text{post} \times \text{treat}) + \eta_{st} + \gamma_c + \Phi X_{it} + \varepsilon_{it},$$

- Throughout the paper, we rely on the variation across family size and over tax years for identification
- For the OBRA 93 DD: Treat is 1+ children (compared to no children), 2+ and 1 separately (compared to no children), or 2+ compared to 1
- Years 1991-1998
- Demographic controls: age, education, race, ethnicity, divorced status
- Other controls: FE for children and year, AFDC/TANF benefit generosity and welfare reform policy variables (interacted with *anykids*), state-year unemployment rates (interacted with *anykids*)
- Clustered on state

Table 3: Difference-in-Difference Estimates of OBRA93 on Employment

Model:	0 vs. 1+ Children		1 vs. 2+ Children	
(Year > 1993) * (1+ children)	0.061***	0.047***		
	(0.01)	(0.01)		
(Year > 1993) * (2+ children)			0.062***	0.024
			(0.01)	(0.02)
Per \$1000 of federal EITC	0.073	0.074	0.078	0.056
% impact	8.6%	8.8%	9.9%	7.0%
Extensive margin elasticity	0.36	0.37	0.45	0.32
Observations	50,508	50,508	25,101	25,101
Mean of the dependent variable	0.844	0.844	0.796	0.796
Controls				
Demographics	X	X	X	X
# of children indicators	X	X	X	X
Year indicators	X	X	X	X
State indicators	X	X	X	X
State * year indicators	X	X	X	X
Simulated tax & transfer benefits		X		X
Any AFDC waiver * 1+ children		X		
Any AFDC waiver * 2+ children				X
Unemp rate * 1+ children		X		
Unemp rate * 2+ children				X

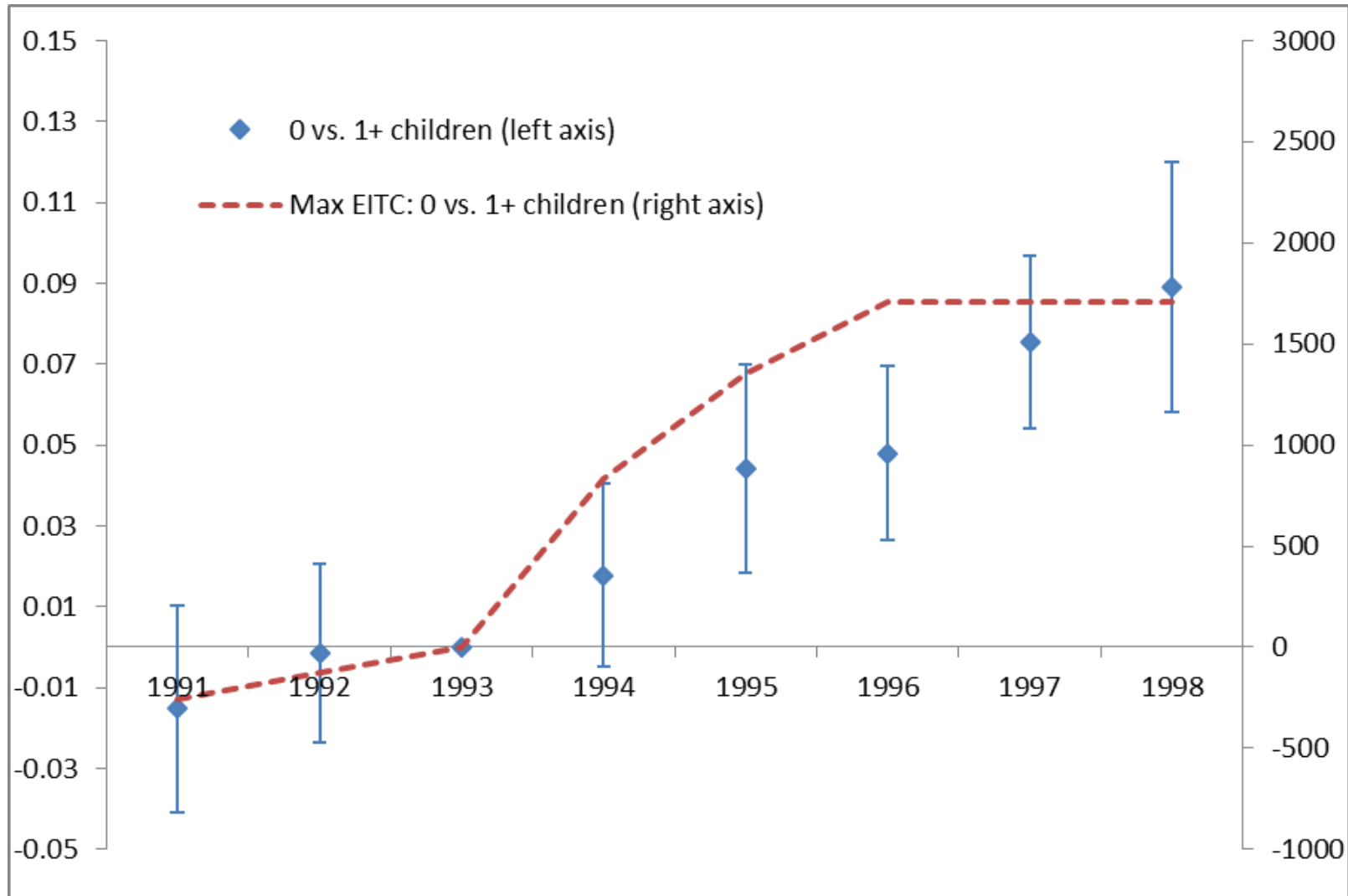
Notes: The sample includes single women, ages 24 through 48 with some college education from the 1992 through 1999 Current Population Survey (March). See text and data appendix for details. Standard errors clustered on state. Significance levels: * 10%, ** 5%, *** 1%.

Event Study Specification

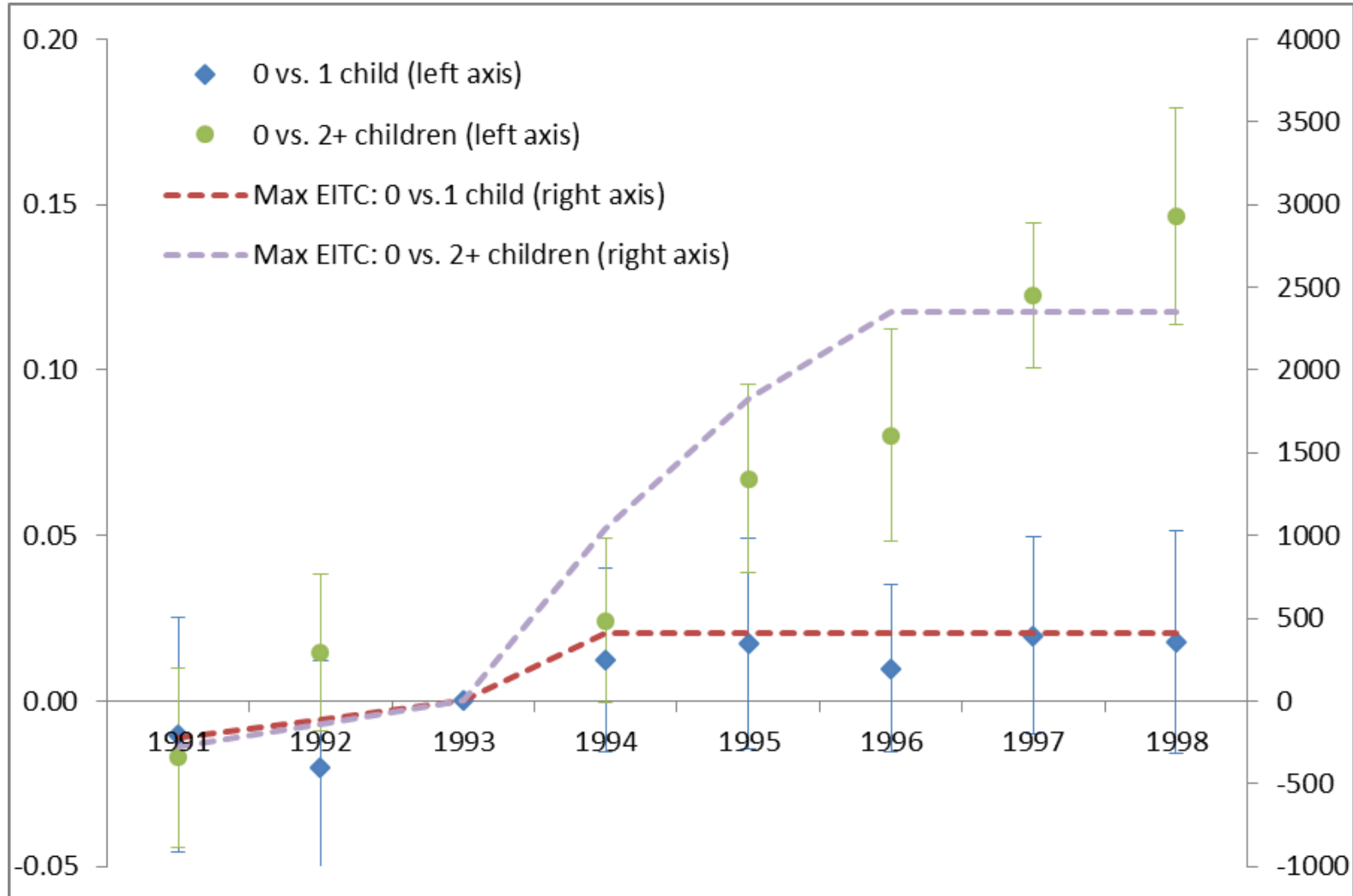
$$y_{it} = \alpha + \sum_{j=t^0}^T \beta_j [I(t = j) \times \text{treat}] + \eta_t + \gamma_c + \Phi X_{it} + \gamma Z_{st} + \varepsilon_{it},$$

- “unpack” the difference in difference to trace out the difference between the T and C in the years leading up to and through OBRA
- Relative to omitted year, 1993
- Test for validity of design (pre-trends) as well as capturing the dynamics of the change post-expansion

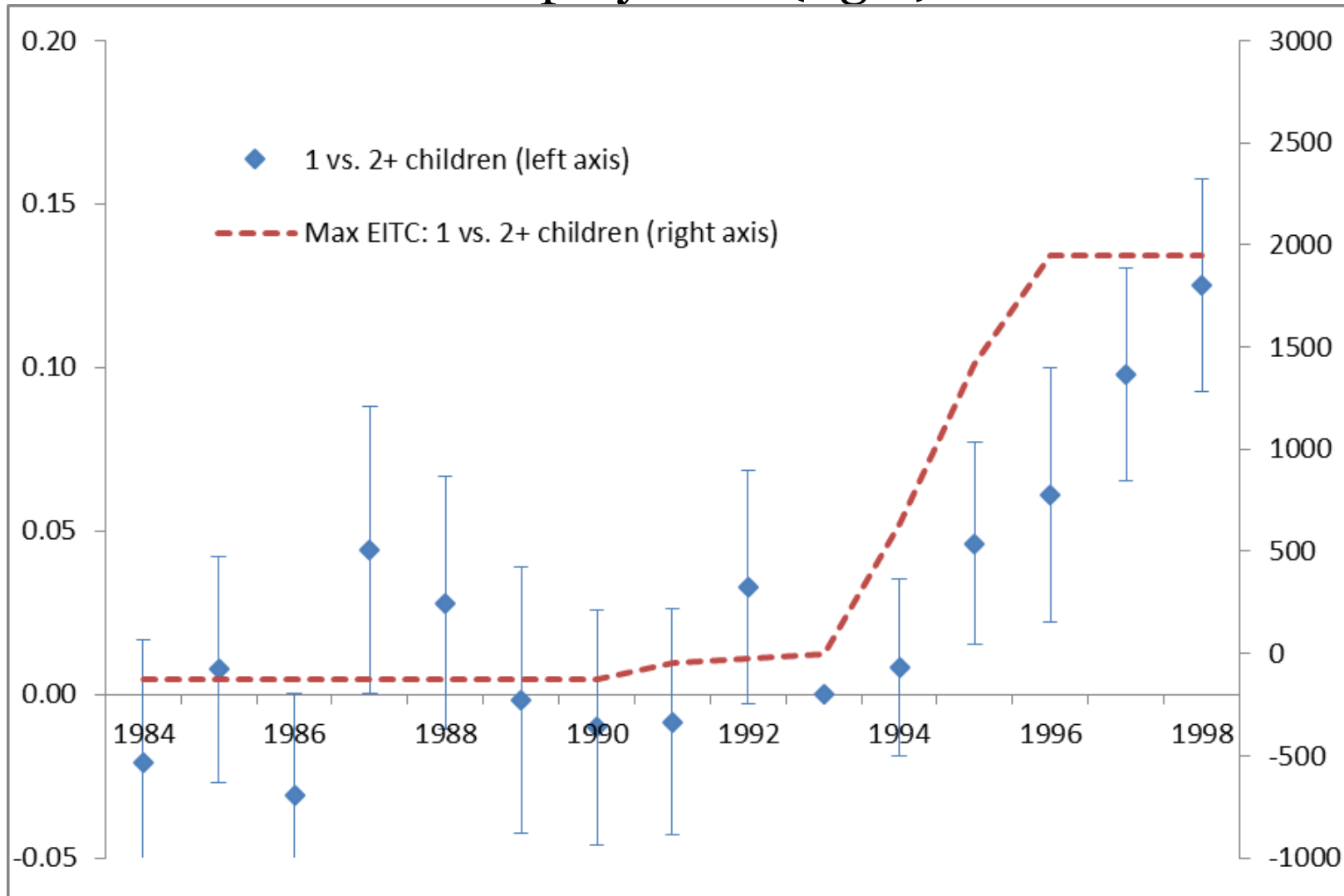
Event Study Estimates of the Effects of OBRA1993 on Employment (Fig 6)



Event Study Estimates of the Effects of OBRA1993 on Employment (Fig 7)



Event Study Estimates of the Effects of OBRA1993 on employment (fig 8)



Magnitudes for labor supply effects

- Our results show that a \$1000 increase in policy-induced increase in the EITC leads to a 5.6-7.8 percentage point increase in employment for single mothers
- Extensive margin elasticities range from 0.32-0.45
- These estimates are in line with the older literature and make a contribution by evaluating the validity of the design (e.g., event study models) and in showing that the effects operate through the 1990s and 2000s.

Methods: Parameterized Difference-in-Difference

$$y_{it} = \alpha + \beta \overline{\text{SIMEITC}}_{ct} + \eta_{st} + \gamma_c + \Phi X_{it} + \varepsilon_{it},$$

- The SIMEITC varies by number of children and year but here we parametrize the treatment variable to be the average EITC simulated for a standardized sample (1982 sample, adjust earnings by CPI growth each year) → goal is to isolate effect of policy changes
- Still rely on identification at the family size by tax year level
- The benefit of this approach is it allows us to extend the data to multiple reforms, we examine back to include TRA86, OBRA90, OBRA93 (1984-1998)
- Controls: same as event study and still clustered on state

Table 5: Parameterized DD Estimates of TRA86, OBRA90 and OBRA93 on Employment

Model:	0 vs. 1+ Children		1 vs. 2+ Children	
Simulated EITC (\$1,000)	0.095*** (0.01)	0.076*** (0.01)	0.139*** (0.02)	0.121*** (0.03)
Per \$1000 of federal EITC	0.062	0.052	0.082	0.082
% impact	7.4%	6.2%	10.5%	10.5%
Extensive margin elasticity	0.31	0.26	0.46	0.46
Observations	96,204	96,204	47,215	47,215
Mean of the dependent variable	0.835	0.835	0.776	0.776
Controls				
Demographics	X	X	X	X
# of children indicators	X	X	X	X
Year indicators	X	X	X	X
State indicators	X	X	X	X
State * year indicators	X	X	X	X
Simulated tax & transfer benefits		X		X
Any AFDC waiver * 1+ children		X		
Any AFDC waiver * 2+ children				X
Unemp rate * 1+ children		X		
Unemp rate * 2+ children				X

Notes: The sample includes single women, ages 24 through 48 with some college education from the 1985 through 1999 Current Population Survey (March). Simulated EITC constructed from 1983 CPS and TAXSIM. See text and data appendix for details. Standard errors clustered on state. Significance levels: *10%, **5%, ***1%.

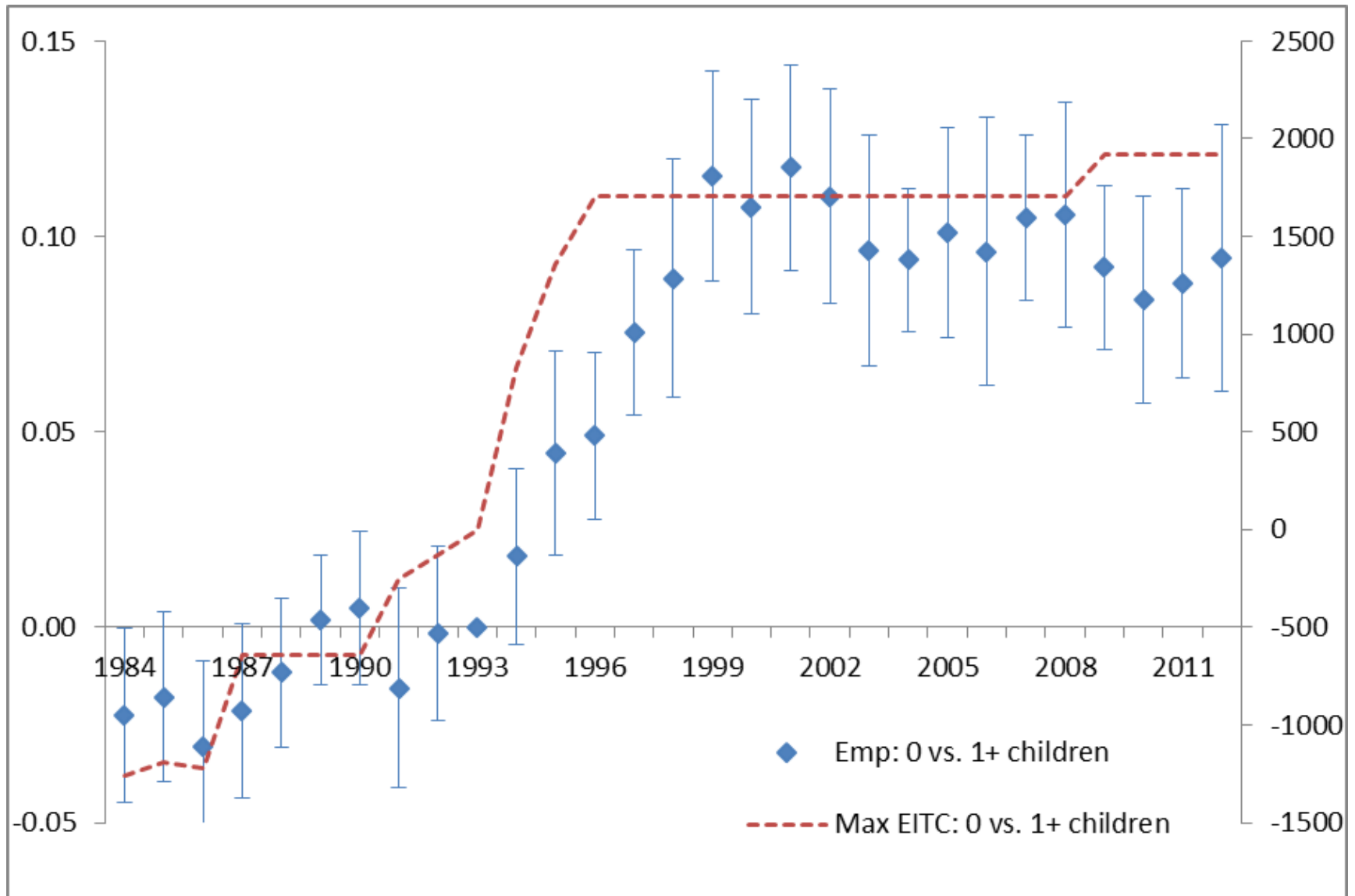
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Extensive margin elasticity	0.31	0.26	0.46	0.46
Observations	96,204	96,204	47,215	47,215
Mean of the dependent variable	0.835			
Controls				
Demographics	X			
# of children indicators	X			
Year indicators	X			
State indicators	X			
State * year indicators	X			
Simulated tax & transfer benefits				
Any AFDC waiver * 1+ children		X		
Any AFDC waiver * 2+ children				X
Unemp rate * 1+ children		X		
Unemp rate * 2+ children				X

The parametrized DD yields very similar magnitude estimates compared to the OBRA 93 DD:
 Elasticity for 0 vs 1+: 0.31 versus 0.36
 Elasticity for 1 vs 2+: 0.46 versus 0.45

Notes: The sample includes single women, ages 24 through 48 with some college education from the 1985 through 1999 Current Population Survey (March). Simulated EITC constructed from 1983 CPS and TAXSIM. See text and data appendix for details. Standard errors clustered on state. Significance levels: *10%, **5%, ***1%.

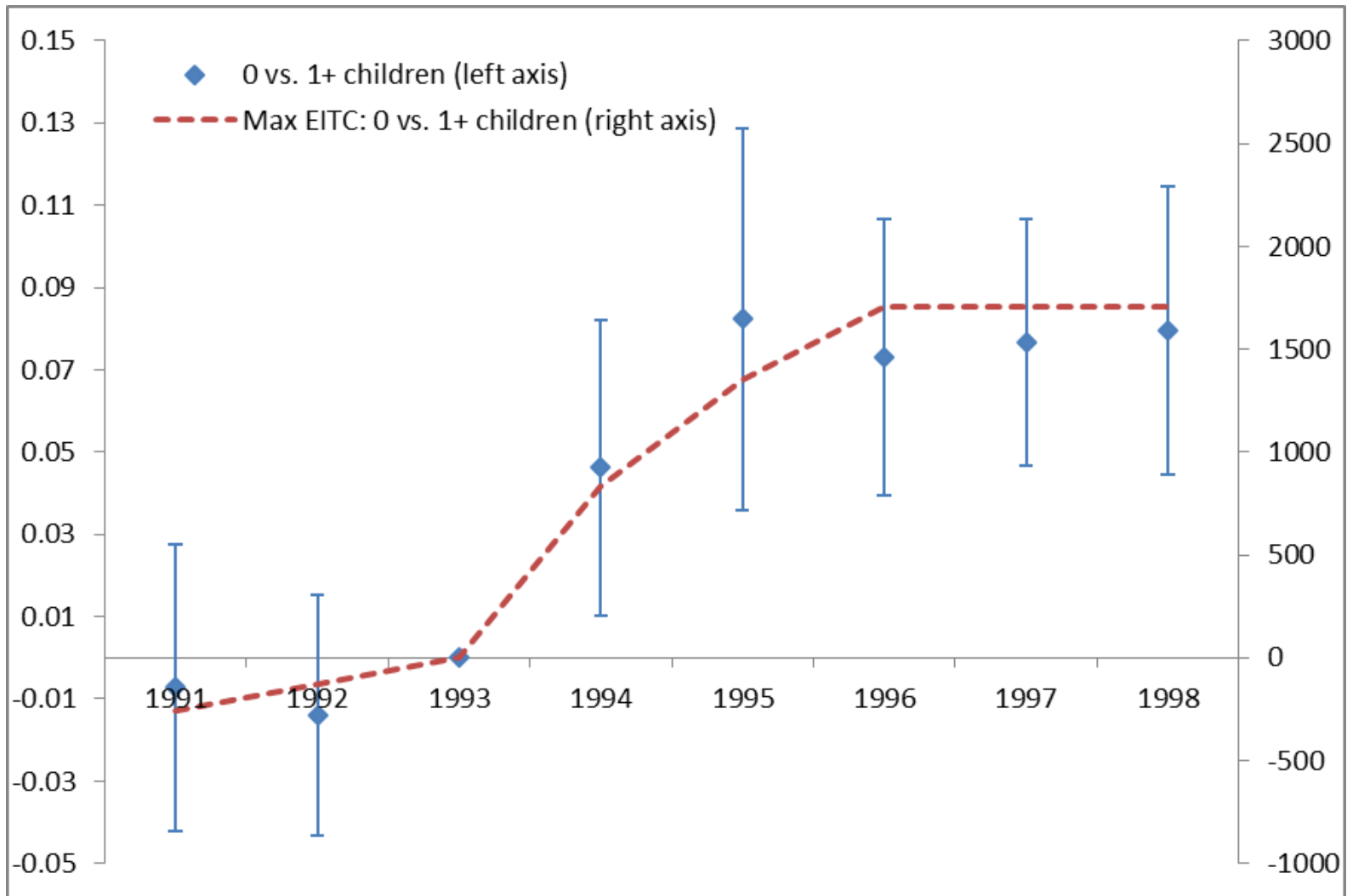
Event Study Estimates on employment, full period



Effects of the EITC on the distribution of income

- We estimate similar event study and difference-in-difference models to estimate how the EITC affects after-tax and transfer (ATT) income
 - Our ATT income measure includes cash income plus in-kind transfers less taxes. It captures direct and indirect effects of the EITC
- We are particularly interested where in the income distribution the credit has its effects
- We construct a series of dichotomous outcome variables, $= 1$ if $\text{ATT income} \geq x\%$ of the federal poverty threshold
- 25 percentile bins: 25%, 50%, 75%, ...500%
- We begin by examining the propensity to have ATT income above 100% poverty

Event Study Estimates of EITC on ATT income > 100% poverty, OBRA93 1+ children vs 0 children (Fig 9)



Event Study Estimates of EITC on ATT income > 100% poverty, OBRA93 2+ children vs 1 child (Fig 10)

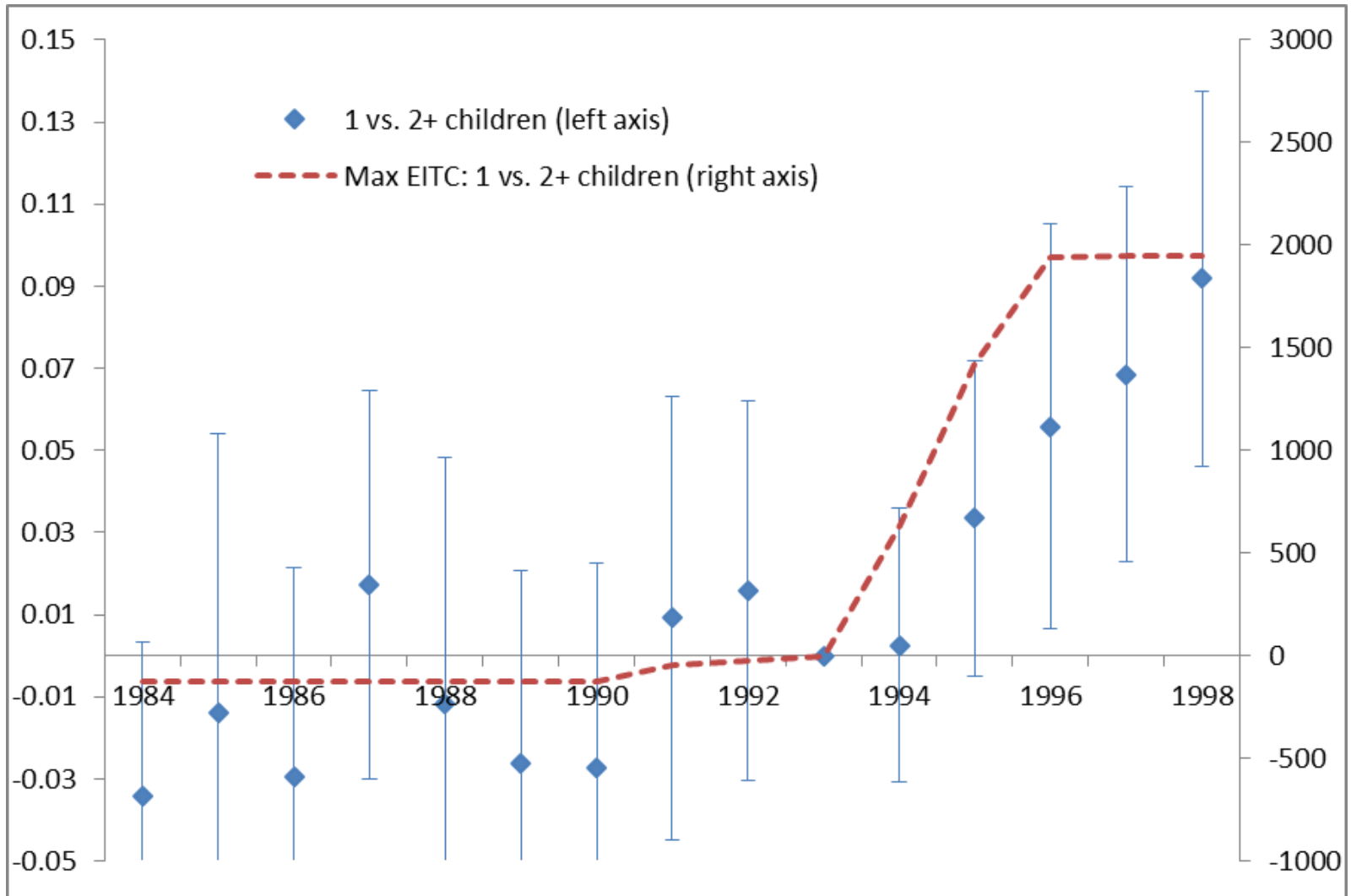


Table 6: Difference-in-Difference Estimates of OBRA93 on Share Above 100% of the Federal Poverty Threshold

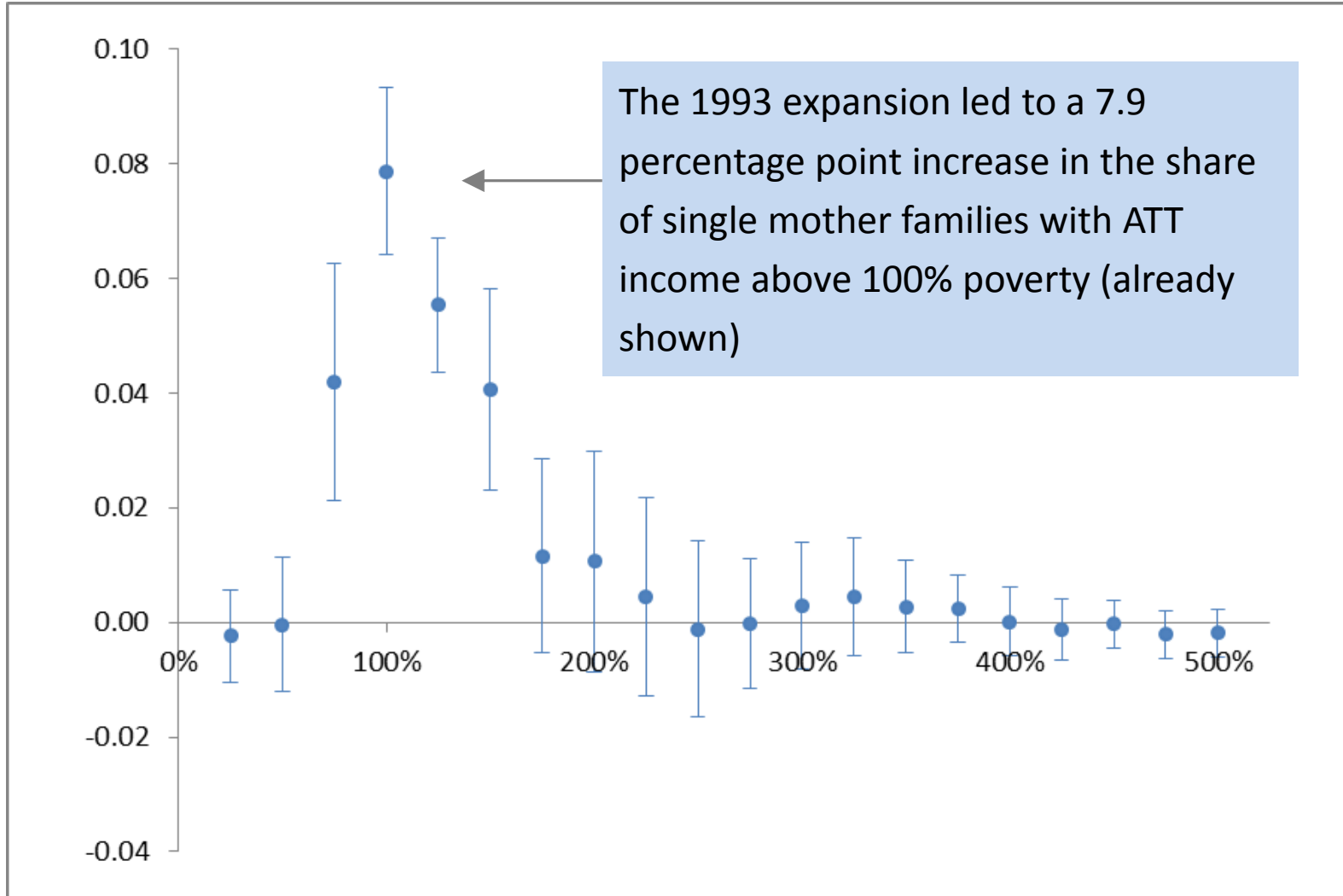
Model:	0 vs. 1+ Children	1 vs. 2+ Children
(Year > 1993) * (1+ children)	0.079*** (0.01)	
(Year > 1993) * (2+ children)		0.043*** (0.01)
Per \$1000 of federal EITC	0.096	0.055
% impact	14.3%	9.2%
Extensive margin elasticity	0.64	0.48
Observations	50,508	25,101
Mean of the dependent variable	0.670	0.601
Controls		
Demographics	X	X
# of children indicators	X	X
Year indicators	X	X
State indicators	X	X
State * year indicators	X	X

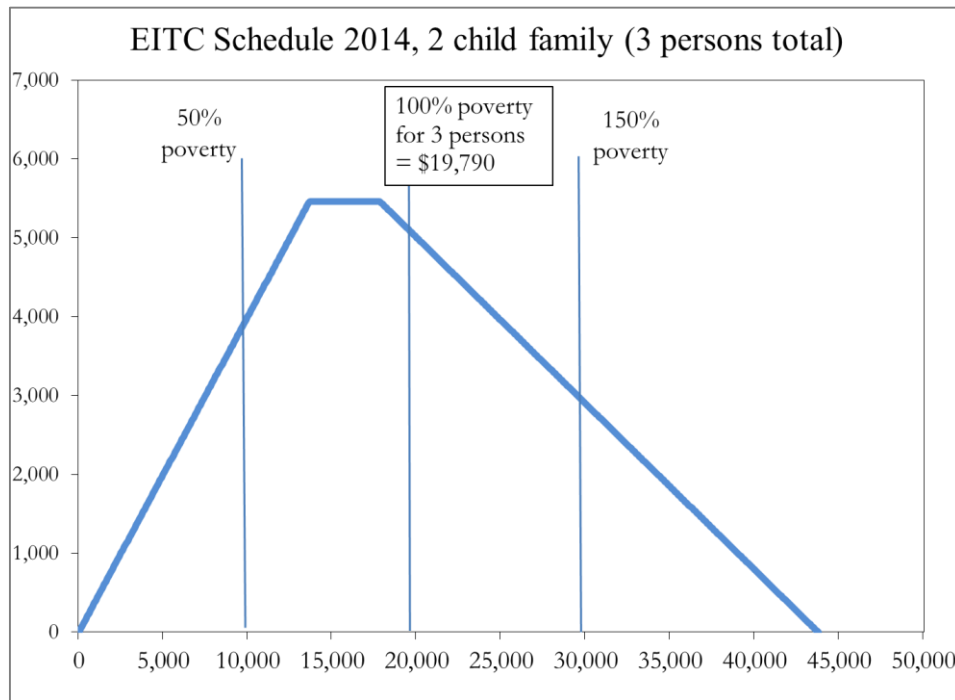
Notes: The sample includes single women, ages 24 through 48 with some college education from the 1992 through 1999 Current Population Survey (March). See text and data appendix for details. Standard errors clustered on state. Significance levels: *10%, **5%, ***1%.

Magnitudes for 100% poverty effects

- The 1993 expansion led to a 7.9 percentage point increase in the share of single mother families with ATT income above poverty (9.4 percentage points per \$1000 of EITC)
- Over the full period (and using the parameterized DD) a \$1000 increase in EITC leads to a 7.9 to 8.4 percentage point increase in the share of single mother families with ATT income above poverty [Table 7]
- We can extend this to look at other cuts of the distribution of income to poverty

Difference-in-Difference Estimates of EITC on income to poverty, OBRA93 (Fig 11)



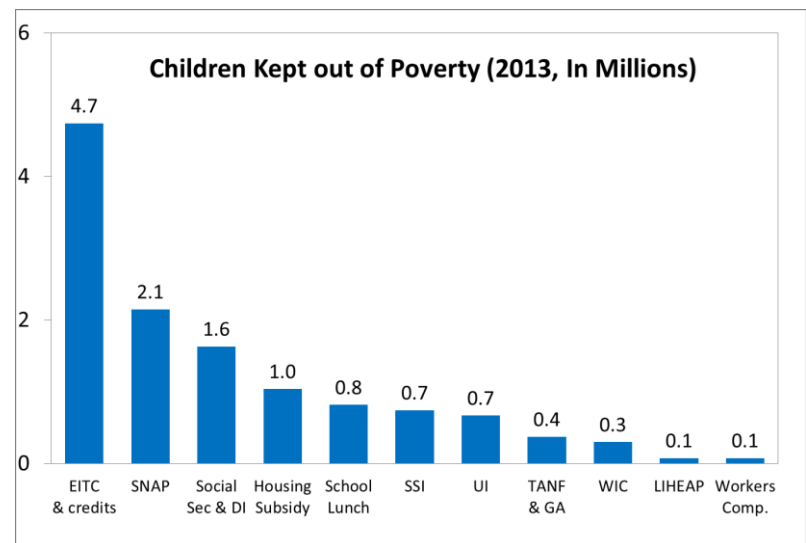


EITC claimants by bins of income to poverty threshold (IRS Admin Data)

	Less than .5 times FPT	Between .5 and 1 of FPT	Between 1 and 1.5 of FPT	Between 1.5 and 2 of FPT	More than 2 times FPT
Singles					
With 1 child	0.12	0.40	0.29	0.15	0.04
With 2 or more children	0.10	0.24	0.43	0.19	0.03
Married filing joint					
With 1 child	0.07	0.27	0.33	0.27	0.06
With 2 or more children	0.06	0.26	0.39	0.25	0.04

Implications the effects of the EITC on poverty and the distribution of income

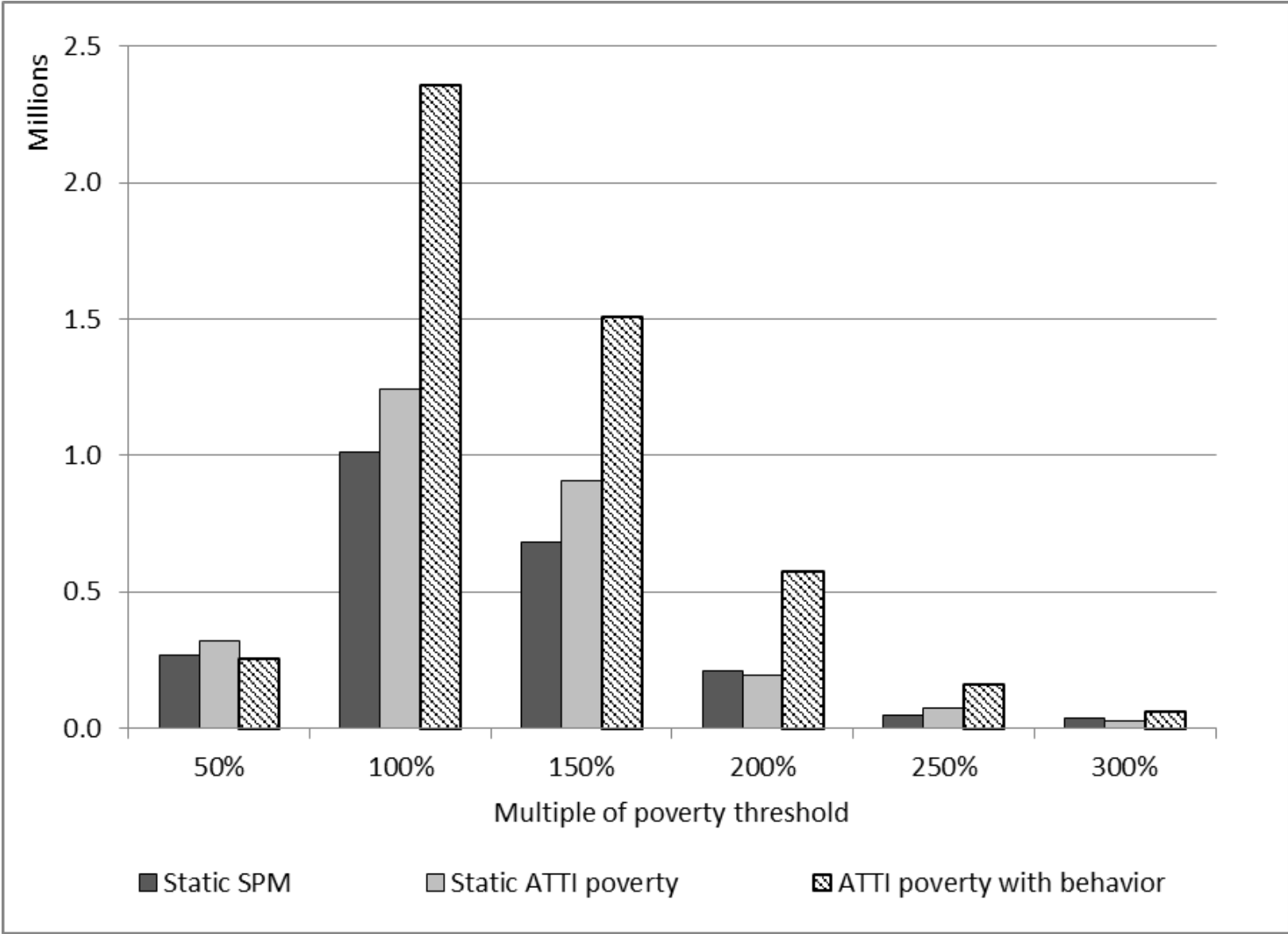
- The figure showed earlier (below) provides a static calculation of the effects of the EITC. Calculated by zeroing out EITC amount and assuming no change in behavior.
- We can use our estimates to simulate the effect of the EITC. We do this for the 2012 EITC



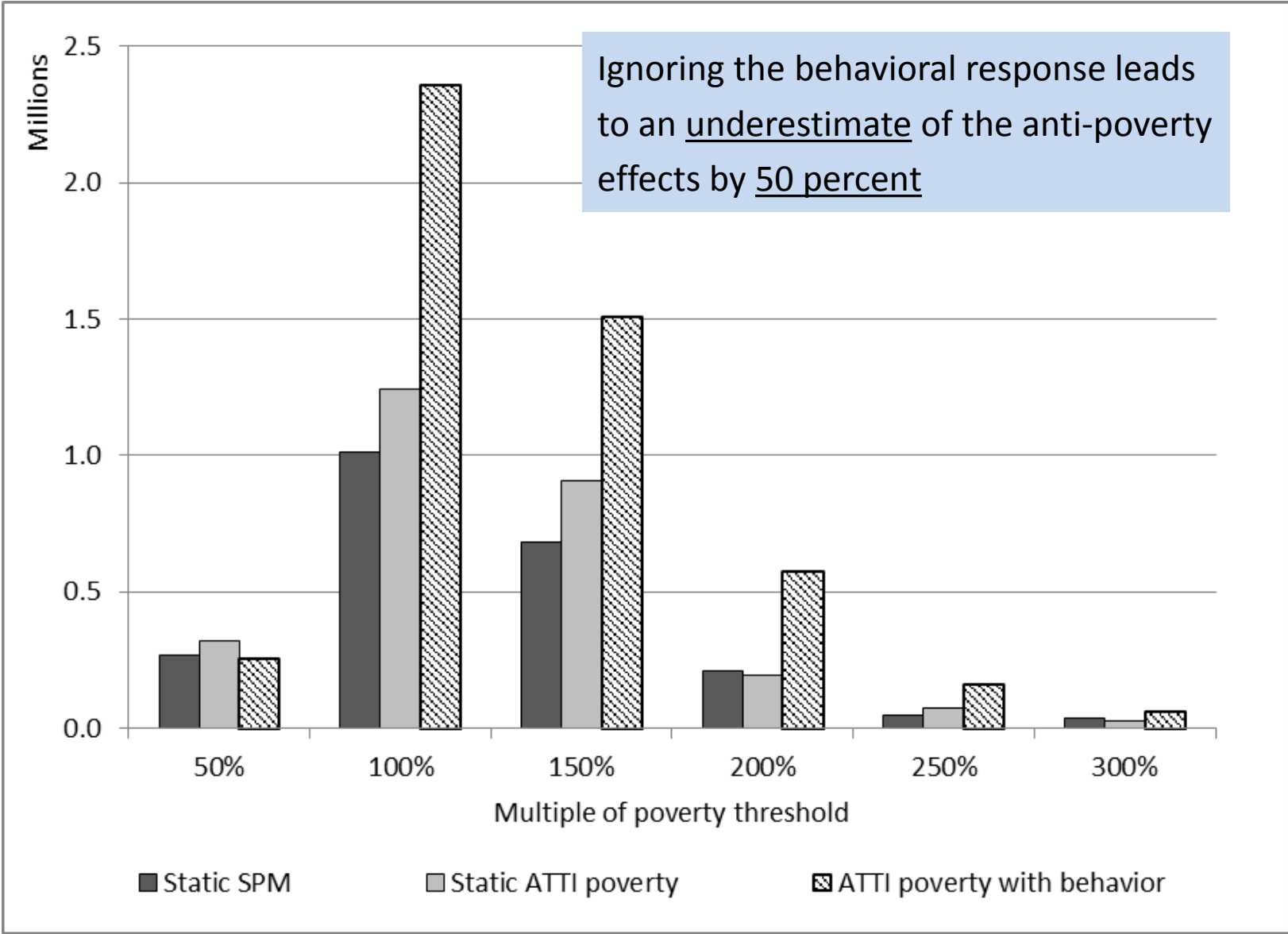
Details of simulation

- Start with the CPS including single women with children ages 24-48 with some college education or less, for calendar year 2012
- Static calculation (does not use regression): zero out EITC for each observation and recalculate poverty
 - We do this for SPM (for reference) and our ATT poverty
- Dynamic calculation: use regression (parameterized DD, with data extended to 2012); predict at observed values; zero out EITC and predict again. Recalculate poverty
- Use CPS weights to aggregate to total number of persons and children lifted above different multiples of poverty

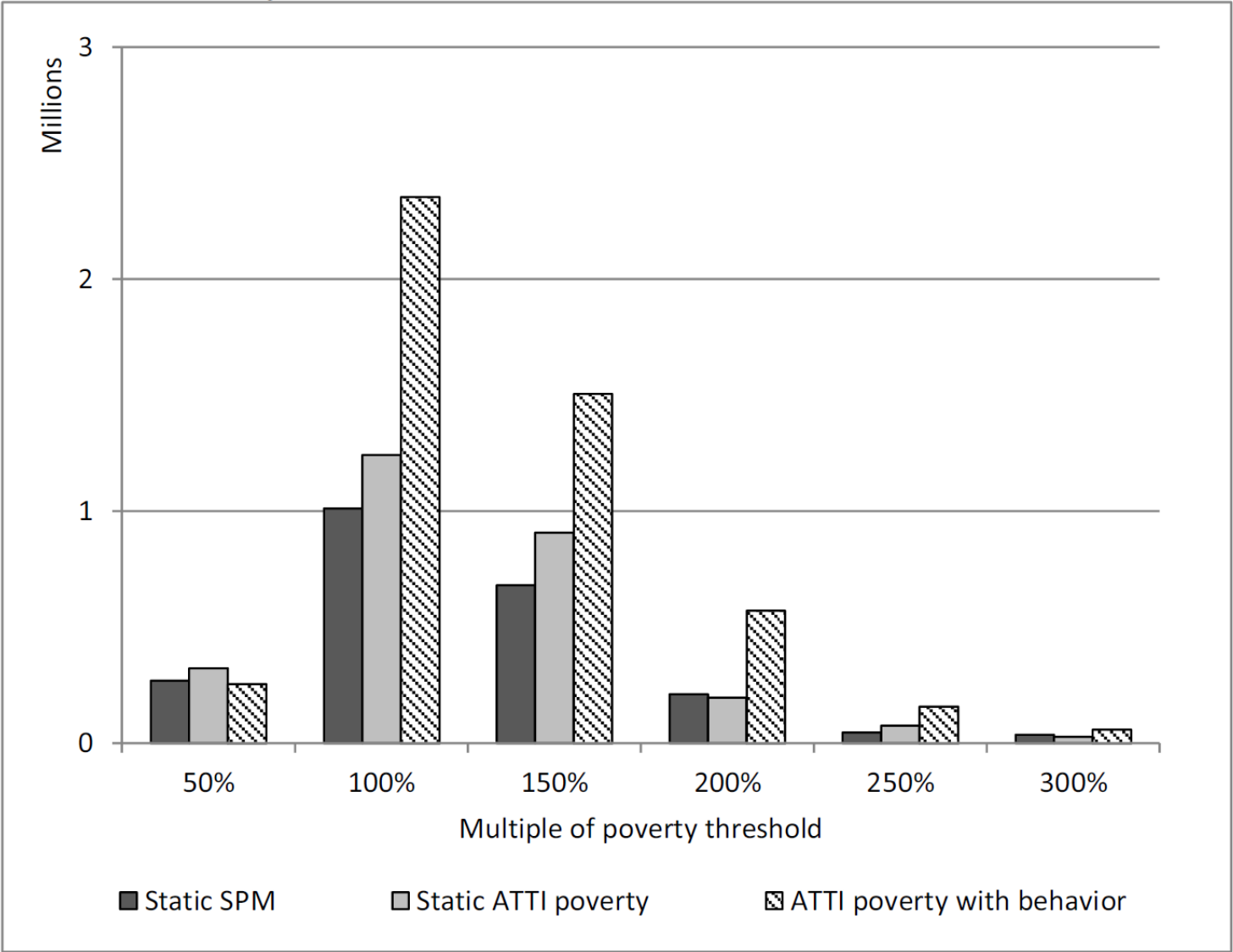
The Effect of the EITC on the Aggregate Number of Children Above a Multiple of the Poverty Threshold (2012, Fig 15)



The Effect of the EITC on the Aggregate Number of Children Above a Multiple of the Poverty Threshold (2012, Fig 15)



The Effect of the EITC on the Aggregate Number of Persons Above a Multiple of the Poverty Threshold (2012, Fig 16)



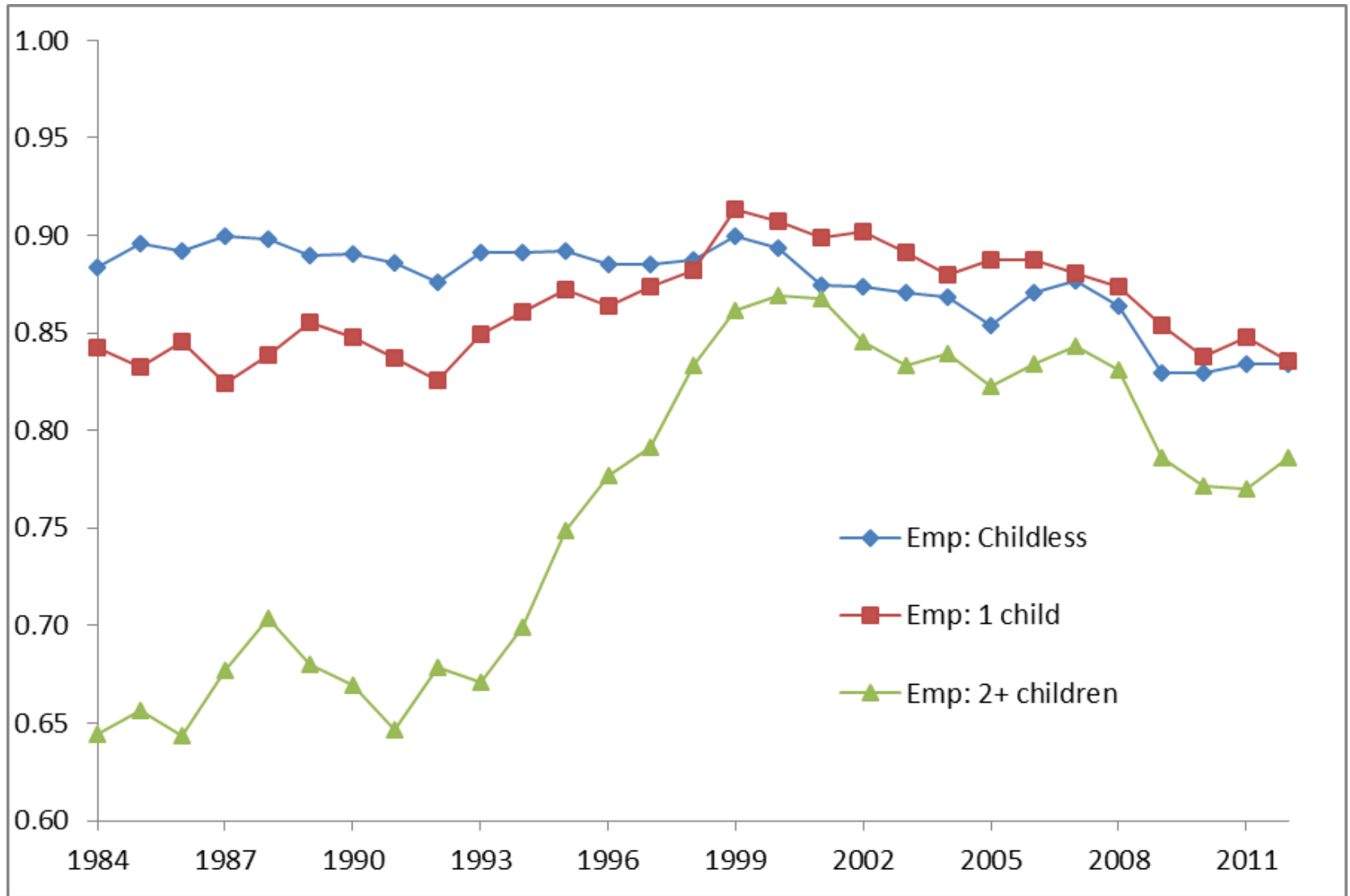
- One caveat of this work is that we focus on single mothers.
- The employment (earnings) incentive effects for this group are positive.
- It is this group where the static calculations should be very underestimated
- For married couples, the labor supply effects are zero or small and negative. The static estimates for this group might be closer to the total effect.

Conclusions

- The EITC is an important component of the tax-and transfer social safety net
- We make a contribution to the literature by applying event study models and updating the evidence to 2013
- We also provide the first estimates of the effect of the EITC on the distribution of income
- This in work safety net program leads to substantial increases employment and reduces inequality (below two times the poverty line)

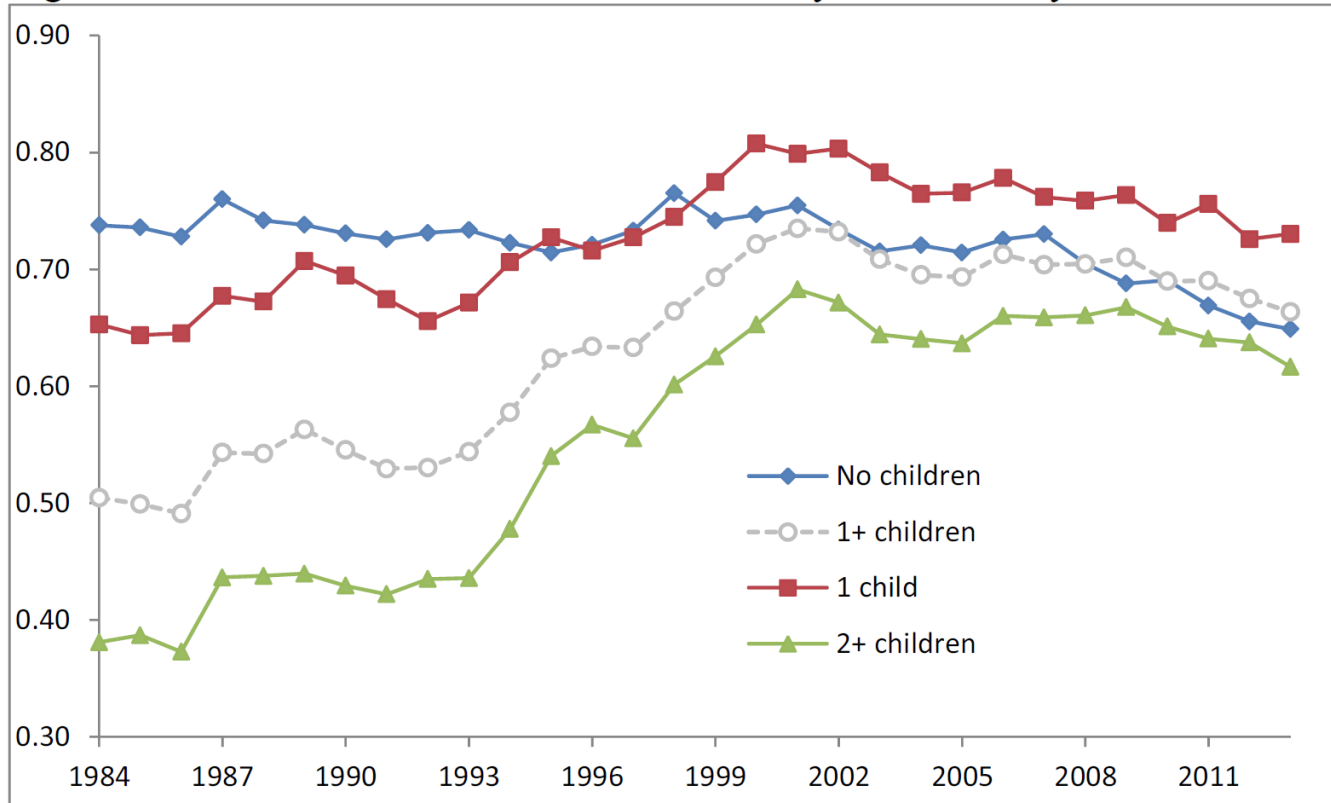
EXTRA SLIDES

Trends in Employment Rates for Single Women, by number of children



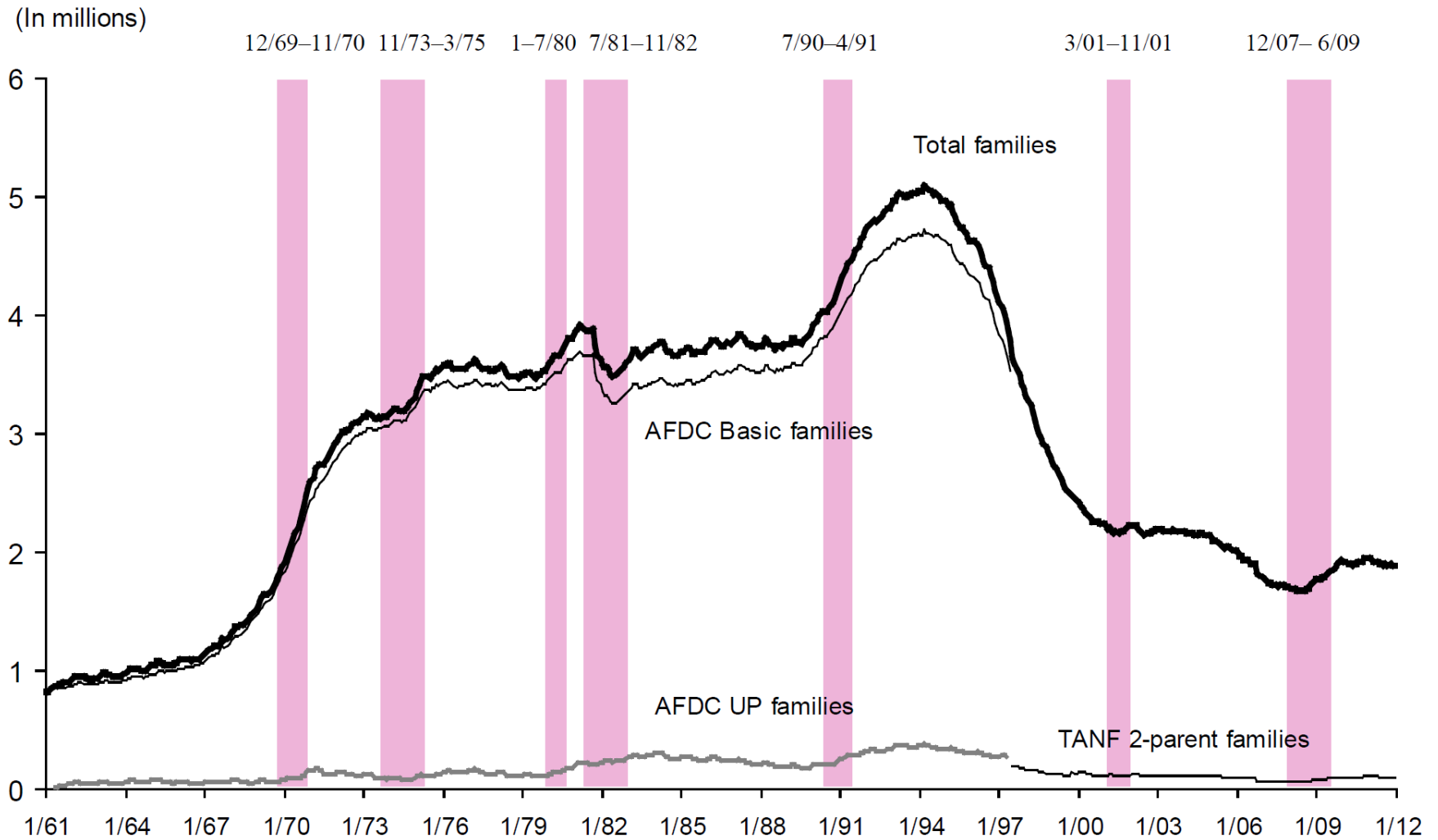
Source: Hoynes and Patel “The Earned Income Tax Credit and the Distribution of Income”

Figure 5: Share Above 100% of Federal Poverty Threshold by Presence and Number of Children



Notes: 1985-2014 CPS, single women, 24-48 years old, some college only. Figure plots share of taxpayers with after-tax and transfer income above 100% of the federal poverty threshold.

Figure TANF 1. AFDC/TANF Families Receiving Income Assistance



Source: U.S. Department of Health and Human Services *Indicators of Welfare Dependence*.
2013

Federal Spending on Selected Means-Tested Programs and Tax Credits, 2012

(Billions of dollars)



Source: Congressional Budget Office.

Table 7: Parameterized DD Estimates of TRA86, OBRA90 and OBRA93 on the Share Above 100% of the Federal Poverty Threshold

Model:	0 vs. 1+ Children	1 vs. 2+ Children
Simulated EITC (\$1,000)	0.129*** (0.01)	0.135*** (0.02)
Per \$1000 of federal EITC % impact	0.084 12.8%	0.079 13.9%
Extensive margin elasticity	0.57	0.68
Observations	96,204	47,215
Mean of the dependent variable	0.658	0.571
Controls		
Demographics	X	X
# of children indicators	X	X
Year indicators	X	X
State indicators	X	X
State * year indicators	X	X

Notes: The sample includes single women, ages 24 through 48 with some college education from the 1985 through 1999 Current Population Survey (March). Simulated EITC constructed from 1983 CPS and TAXSIM. See text and data appendix for details. Standard errors clustered on state. Significance levels: *10%, **5%, ***1%.

Effects of a \$1000 increase in simulated EITC benefits on income to poverty (1984-1998, Fig 13)

