Taxation and Labor Force Participation: The EITC Reconsidered

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The Extensive Margin of Labor Supply

- A consensus view that extensive margin responses are larger than intensive margin responses

- Where does this consensus originate from?
  - Early labor supply literature (Heckman 1993)
  - Macro business cycle literature (Hansen 1985; Rogerson 1988)
  - Labor supply literature studying EITC reform (Eissa & Liebman 1996; Meyer & Rosenbaum 2001)

- A meta study by Chetty et al. (2013) puts the extensive margin elasticity at around 0.3
The Earned Income Tax Credit (EITC)

- A means-tested transfer that is conditional on positive earnings and children

- A large literature studies the labor supply effects of the EITC, particularly on single mothers
  - Most of this work exploits federal EITC expansions enacted in 1986, 1990, and 1993

- Nichols & Rothstein (2015) summarize the consensus view:
  
  There is remarkable consensus around a few key results (...) essentially all authors agree that the EITC expansion led to sizeable increases in single mothers’ employment rates
Literature

► Labor market impacts of the EITC:


► Labor market impacts of the FC/WFTC/WTC:

Why Revisit This Question?

- Have I found a new source of identifying variation? (NO)
  - I study EITC reforms in the US (federal and state)
  - I study WFTC/WTC reforms in the UK

- Have I gained access to better data? (NO)
  - I use CPS data for the US and LFS/BHPS data for the UK

- So I study the same data and reforms, but viewed through a different lens
  - The consensus view is based on work from about 20 years ago
In-Work Transfers in the US and UK
EITC Maximum Credit Over Time

Maximum Annual Credit (2017 USD)

Year

0 children

1 child

2 children

3+ children

Tax Reduction Act of 1975 TRA86 OBRA90 OBRA93 ARRA

Maximum Annual Credit (2017 USD)
EITC vs WTC Schedules in 2017

Single Women with 1 Child

- EITC
- WTC w/ childcare subsidy
- WTC, w/o childcare subsidy

![Graph showing EITC vs WTC schedules for single women with 1 child.](image)
WTC Maximum Credit Over Time

Maximum Annual Credit (2017 USD)

Year

- FIS
- FC
- WFTC
- WTC

- 3 children
- 2 children
- 1 child
- 0 children

With Child Tax Credit
EITC Effects on the Extensive Margin?
Data

- Current Population Survey (CPS), March files
  - 50-year period (1968-2018)
  - From around 150,000 to 200,000 individuals per year

- Measures of extensive margin labor supply:
  1. Employed last week
  2. Participated last week
     - Employed or unemployed last week
  3. Employed last year
     - Positive earnings last year
  4. Participated last year
     - Employed or unemployed for 1+ weeks last year
Labor Force Participation of Single Women
With and Without Children

Unemployment Rate

With Children

Without Children

Labor Force Participation (%)

Year

With Children

Without Children

Annual Employment

Low Education
Labor Force Participation of Single Women
With and Without Children

50 years of relative stability, apart from these 5 years

Unemployment Rate

Labor Force Participation (%)

50 60 70 80 90 100

Year

With Children

Without Children

50 years of relative stability, apart from these 5 years

Annual Employment

Low Education
Labor Force Participation of Single Women
With and Without Children

50 years of relative stability, apart from these 5 years

Annual Employment
Low Education
Labor Force Participation of Single Women
With and Without Children

Year

Tax Reduction Act of 1975
TRA86
TRB90
OBRA93
ARRA

Labor Force Participation (%)
60 65 70 75 80 85 90 95 100

With Children
Without Children

Unemployment Rate
50 60 70 80 90

Annual Employment
Low Education
Labor Force Participation of Single Women
With and Without Children

With Children
Without Children

Tax Reduction Act of 1975
TRA86
OBRA90
OBRA93
ARRA
PRWORA
State Welfare Waivers

Unemployment Rate

Year

Annual Employment
Low Education

68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04 06 08 10 12 14 16 18
60 70 80 90 100

Labor Force Participation (%)

With Children
Without Children
Labor Force Participation of Single Women
With and Without Children

Tax Reduction Act of 1975
TR86 OBRA90 OBRA93 PRWORA
ARRA
State Welfare Waivers

Unemployment Rate

Year

Labor Force Participation (%)

With Children
Without Children
Unemployment

Annual Employment
Low Education
Labor Force Participation of Single Women
By Number of Children

Tax Reduction Act of 1975
TRA86
OBRA90
OBRA93
ARRA

Labor Force Participation (%)

Year
0 children
1 child
2 children
3+ children

Annual Employment
Low Education
Labor Force Participation of Single Women
By Number of Children

- Tax Reduction Act of 1975
- TRA86
- OBRA90
- OBRA93
- OBRA

Much larger increase by those with 3+ kids

Labor Force Participation (%)
Year
- 0 children
- 1 child
- 2 children
- 3+ children

Annual Employment
Low Education
Labor Force Participation of Single Women
By Number of Children

Tax Reduction Act of 1975
TRA86
OBRA90
OBRA93
ARRA

But no increase here by those with 3+ kids

Annual Employment
Low Education
Labor Force Participation of Single Women

By Number of Children

Tax Reduction Act of 1975
TRA86
OBRA90
OBRA93
ARRA

And no increase here either

40 50 60 70 80 90

Labor Force Participation (%)

-1 -.5 0 .5 1

68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04 06 08 10 12 14 16 18

Year

0 children 1 child 2 children 3+ children

Annual Employment Low Education Skip Married
Labor Force Participation of Married Women

With and Without Children

Tax Reduction Act of 1975

TRA86

OBRA90

OBRA93

ARRA

2.6

4.6

Unemployment Rate

40 50 60 70 80 90

Labor Force Participation (%)

68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100 102 104 106 108 110 112 114 116 118

Year

With Children

Without Children
Labor Force Participation of Married Women
With and Without Children (Spousal Earnings Below First Kink)

Year
68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04 06 08 10 12 14 16 18

Labor Force Participation (%)
60 65 70 75 80 85 90

Unemployment Rate
40 50 60 70 80 90

Tax Reduction Act of 1975
TRA86 OBRA90 OBRA93 ARRA

Annual Employment
Low Education Above Kink
Labor Force Participation of Married Women
Spousal Earnings Below and Above First Kink (Conditional on Children)

Unemployment Rate

Labor Force Participation (%)

Year

Spousal Earnings Below Kink
Spousal Earnings Above Kink

Annual Employment
Low Education
Red Flags

The participation increase for single mothers in 1994-99 is massive and follows the 1993 EITC reform, but...

- How do we separate EITC effects from the key confounders?

- Why do those with 3+ kids increase participation so much more than those with 2 kids after 1993 (but not elsewhere)?

- Why are there no visible effects for married women?

- Why are there no visible effects of the 1975, 1986, 1990, and 2009 reforms?

- It is difficult to reconcile the patterns with optimization friction
Effect of the 1975 Reform
Labor Force Participation of Single Women
With and Without Children

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Tax Reduction Act of 1975

Unemployment Rate
50 60 70 80 90

Labor Force Participation (%)
68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85

Annual Employment
Low Education
Labor Force Participation of Single Women
With and Without Children

Tax Reduction Act of 1975

Unemployment Rate

Labor Force Participation (%)

Year

With Children
Without Children
Unemployment

Annual Employment
Low Education
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children

![Graph showing the impact on labor force participation over years with error bars.

Key:
- Annual Employment
- Low Education

Tax Reduction Act of 1975

Y-axis: Impact on Labor Force Participation (%)
X-axis: Year

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1975 Reform: Conclusions

- No extensive margin effects for single women
  - Business cycle variation that coincides with the reform
  - This mainly affects the earnings-based measure of participation
    → illusory short-term effect of the EITC

- No extensive margin effects for married women either

- Reconciling these conclusions with Bastian (2018)
  - Confounding effects of business cycles (single women) and secular trends (married women) that vary by children
Effect of the 1993 Reform
Empirical Specification

DiD specification:

\[ P_{ist} = \sum_j \alpha_j \cdot Year_{j=t} + \beta \cdot Kids_i + \sum_j \gamma_j \cdot Year_{j=t} \cdot Kids_i \]
\[ + \sum_j \sum_k \delta_{jk} \cdot Year_{j=t} \cdot W_{sk}^k + \sum_j \sum_k \zeta_{jk} \cdot Year_{j=t} \cdot Kids_i \cdot W_{sk}^k \]
\[ + \eta \cdot U_{st} + \theta \cdot U_{st} \cdot Kids_i + \nu_{ist} \]

where \( W_{sk}^k \) is an indicator for state \( s \) having waiver type \( k \) in year \( t \) and \( U_{st} \) is the unemployment rate in state \( s \) in year \( t \)

- Six welfare waivers: termination time limits, work-requirement time limits, family caps, JOBS exemptions, JOBS sanctions, and earnings disregards
Empirical Specification

DiD specification:

\[ P_{ist} = \sum_{j} \alpha_{j} \cdot Year_{j=t} + \beta \cdot Kids_{i} + \sum_{j} \gamma_{j} \cdot Year_{j=t} \cdot Kids_{i} \]

\[ + \sum_{j} \sum_{k} \delta_{j}^{k} \cdot Year_{j=t} \cdot W_{sj}^{k} + \sum_{j} \sum_{k} \zeta_{j}^{k} \cdot Year_{j=t} \cdot Kids_{i} \cdot W_{sj}^{k} \]

\[ + \eta \cdot U_{st} + \theta \cdot U_{st} \cdot Kids_{i} + \nu_{ist} \]

where \( W_{st}^{k} \) is an indicator for state \( s \) having waiver type \( k \) in year \( t \) and \( U_{st} \) is the unemployment rate in state \( s \) in year \( t \).

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Empirical Specification

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\[ + \sum_j \sum_k \delta_{j}^k \cdot Year_{j=t} \cdot W_{stj}^k + \sum_j \sum_k \zeta_{j}^k \cdot Year_{j=t} \cdot Kids_i \cdot W_{stj}^k \]

\[ + \eta \cdot U_{st} + \theta \cdot U_{st} \cdot Kids_i + \nu_{ist} \]

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- **Six welfare waivers:** termination time limits, work-requirement time limits, family caps, JOBS exemptions, JOBS sanctions, and earnings disregards
Labor Force Participation of Single Women
With and Without Children

Unemployment Rate

Year

Labor Force Participation (%)

With Children
Without Children
Labor Force Participation of Single Women

DiD: Difference Between Those With and Without Children

Impact on Labor Force Participation (%)

Year
Labor Force Participation of Single Women

DiD: Difference Between Those With and Without Children
(Controlling for State Unemployment)

Impact on Labor Force Participation (%)

Year

OBRA93 PRWORA

Unemployment Rate

-10 -5 0 5 10 15 20

Impact on Labor Force Participation (%)

83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03

Year

Raw Means With Controls
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Controlling for State Unemployment and Welfare Waivers)
1993 Reform: Conclusions

- The participation increase for single mothers is correlated with unemployment changes and welfare waivers across states.

- Controlling for state-level variation in unemployment and welfare waivers eliminates any significant effect of the EITC between 1994-96 (prior to PRWORA).
  - A weak test as it absorbs only cross-state effects, not any national effects.

- The drivers of the 1990s participation boom are unidentified, but the patterns are consistent with no effect of the EITC.
State EITC Supplements
State EITC Supplements

- Between 1984-2018, many states instituted EITC supplements
  - 28 states currently have EITC supplements
  - Many supplements are small or were increased only gradually

- Some states implemented larger reforms
  - Define “large reform” as an increase in the state EITC of at least 20\% (refundable) of the federal credit within 3 years
  - 8 states had such reforms
States with an EITC Supplement in 1990

- Any Supplement
- No Supplement

Map showing states in blue for any supplement and white for no supplement.
States with an EITC Supplement in 2010

[Map of the United States showing states with and without an EITC Supplement in 2010]

Key:
- Any Supplement
- No Supplement
States with an EITC Supplement in 2018

- Any Supplement
- No Supplement
States with an EITC Supplement in 2018

- Large Reform
- Any Supplement
- No Supplement

- 2015: California
- 1998: Wisconsin, Minnesota
- 1999: Wisconsin, Minnesota
- 2011: New York

Map showing states with EITC supplements from 1988 to 2015.
Synthetic Control Approach

- For each state with an EITC supplement, a synthetic control state is created from those without a supplement.

- I focus on state reforms:
  - Introduction of any state EITC supplement
  - Large reforms, as defined earlier

- I match on pre-reform variables:
  - Labor force participation (level and trend), unemployment rate (level and change), and welfare participation rate
DiD specification:

\[ P_{st} = \sum_{j} \alpha_j \cdot Event_{j=t} + \beta \cdot Treat_s + \sum_{j} \gamma_j \cdot Event_{j=t} \cdot Treat_s + \lambda_s + \nu_{st} \]

where \( Event_{j=t} \) are event time indicators, \( Treat_s \) is an indicator for being a treatment state, and \( \lambda_s \) is a state fixed effect.

- The specification is run on an unbalanced panel of states over an event window from -10 to +10.
Large State EITC Reforms: Event Study
Treatment and Synthetic Control States

Labor Force Participation (%) vs. Year

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

Treatments vs. Synthetic Controls

All Reforms | Annual Participation | Weekly Employment | Annual Employment
Large State EITC Reforms: Event Study
DiD: Difference Between Treatment and Synthetic Control States

Impact on Labor Force Participation (%)

Year

Reform

Placebos  All Reforms  Annual Participation  Weekly Employment  Annual Employment
State EITC Supplements: Conclusions

- State EITCs create variation that does not rely on children
  - This avoids confounders that vary by children
  - But introduces confounders that vary by state
    → synthetic control approach

- Most state EITC reforms have been too small for a credible DiD, but 8 reforms were sizeable

- Evidence from large state EITC reforms:
  - No clear evidence of any extensive margin effects
WFTC Effects on the Extensive Margin?
Data

- **Main data: Labour Force Survey (LFS):**
  - Repeated cross-section
  - 1992-2017
  - Around 400,000 individuals per year

- **Alternate data: British Household Panel Survey (BHPS):**
  - Panel
  - 1991-2008
  - Started with 10,000 individuals in 1991
Empirical Specification

DiD specification:

\[
P_{irt} = \sum_j \alpha_j \cdot Year_{j=t} + \beta \cdot Kids_i + \sum_j \gamma_j \cdot Year_{j=t} \cdot Kids_i \\
+ \delta \cdot U_{rt} + \zeta \cdot U_{rt} \cdot Kids_i + X_i \cdot \phi + X_i \cdot Kids_i \cdot \psi + \nu_{irt}
\]

where \( U_{rt} \) is the unemployment rate in region \( r \) in year \( t \), and \( X_i \) includes dummies for age, age of youngest child, and education

- Allow for linear, group-specific pre-trend, i.e. residualize \( P_{irt} \) using linear trend estimated on pre-data
Labor Force Participation of Single Women
With and Without Children
(Normalized)

With Children
Without Children

Low Education
Employment (All Edu)
Employment (Low Edu)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
Labor Force Participation of Single Women

DiD: Difference Between Those With and Without Children
(Adding Linear Pre-Trends)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Controlling for Unemployment and Demographics)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Adding Pre-Trend Controls)
1999 WFTC Reform: Findings and Issues

- The real size of the 1999 WFTC expansion:
  - The WFTC expansion was massive in itself, but there were offsetting changes from the welfare system
  - Still, a sizeable net incentive for the typical single mother (e.g., Blundell & Hoynes 2004)

- The effects on the extensive margin of labor supply:
  - No effects on labor force participation
    - This holds in both LFS and BHPS
  - Suggestive effects on employment
    - DiD effect driven by break in the control group → parallel trend assumption is tenuous
Conclusions
Where Does This Leave Us?

- A consensus view that participation responses can be sizeable
  - This view is partly grounded in EITC studies
  - But no study identifies these responses to a modern bar
  - Cross-country puzzle (Kleven 2014)

- Revisiting historical EITC and WFTC reforms, I find no clear evidence of participation responses

- What happened with single mothers in the US in the 1990s?
  - Maybe a unique combination of EITC reform, welfare reform, economic upturn, and changing social norms?
  - Economic history rather than anything externally valid
Appendix
WTC Maximum Credit Over Time
Single Women with 2 Children

Earnings (USD)

- EITC
- WTC with childcare subsidy
- WTC, without childcare subsidy

Annual Credit (USD)
WTC Maximum Credit Over Time
Including the Child Tax Credit

Maximum Annual Credit (2017 USD)

Year

0
10000
20000
30000
40000
50000

FIS
FC
WFTC
WTC

1 child
2 children
3 children
0 children

0 / 10000 / 20000 / 30000 / 40000 / 50000
Extensive Margin Measures

Single Women, 20-50
# Labor Force Participation of Single Women

With and Without Children

*(Annual Employment)*

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<th>Year (for LFP)</th>
<th>With Children</th>
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**Positive Earnings (%):**

LFP: 72 / 167

**Unemployment Rate:**

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**Positive Earnings (%):**

- With Children: 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100
- Without Children: 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100

**Year:**

- 68
- 70
- 72
- 74
- 76
- 78
- 80
- 82
- 84
- 86
- 88
- 90
- 92
- 94
- 96
- 98
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- 02
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- 06
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- 10
- 12
- 14
- 16
- 18

**Graph:**

- **With Children** (Blue Dots)
- **Without Children** (Black Dots)
Labor Force Participation of Single Women
With and Without Children
(Annual Employment)

50 years of relative stability, apart from these 7 years

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</table>
| 12   | 08            | 50 years of relative stability, apart from these 7 years

Positive Earnings (%)

- With Children
- Without Children
Labor Force Participation of Single Women
With and Without Children
(Annual Employment)

50 years of relative stability, apart from these 7 years

14.9pp
14.9pp

Unemployment Rate

Positive Earnings (%)

Year

With Children
Without Children
Labor Force Participation of Single Women
With and Without Children
(Annual Employment)

Positive Earnings (%)

Year

With Children
Without Children
Labor Force Participation of Single Women
With and Without Children
(Annual Employment)
Labor Force Participation of Single Women
With and Without Children
(Annual Employment)

- Tax Reduction Act of 1975
- TRA86
- OBRA90
- OBRA93
- PRWORA
- ARRA
- State Welfare Waivers

Unemployment Rate
- Year
- Positive Earnings (%)
- LFP
Labor Force Participation of Single Women
With and Without Children
(Annual Employment)

- Tax Reduction Act of 1975
- TRA86
- OBRA90
- OBRA93
- PRWORA
- ARRA
- State Welfare Waivers

Unemployment Rate

Positive Earnings (%)

Year

With Children
Without Children
Unemployment
Labor Force Participation of Single Women
By Number of Children
(Annual Employment)
Labor Force Participation of Single Women
By Number of Children
(Annual Employment)

- Much larger increase by those with 3+ kids

Positive Earnings (%)

Year

- 0 children
- 1 child
- 2 children
- 3+ children
Labor Force Participation of Single Women
By Number of Children
(Annual Employment)

Tax Reduction Act of 1975
TRA86
OBRA90
OBRA93
ARRA
But no increase here by those with 3+ kids

Positive Earnings (%)

68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04 06 08 10 12 14 16 18
Year

0 children 1 child 2 children 3+ children
Labor Force Participation of Single Women
By Number of Children
(Annual Employment)

And no increase here either

LFP
Labor Force Participation of Married Women
With and Without Children
(Annual Employment)

Tax Reduction
Act of 1975
TRA86 OBRA90 OBRA93 ARRA
2.5 4.5
Unemployment Rate
40 50 60 70 80 90
Positive Earnings (%)
68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04 06 08 10 12 14 16 18
Year
With Children
Without Children

LFP 83 / 167
**Labor Force Participation of Married Women**

*With and Without Children (Spousal Earnings Below First Kink)*

*(Annual Employment)*

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*Key Events:*
- **Tax Reduction Act of 1975**
- **TRA86**
- **OBRA90**
- **OBRA93**
- **ARRA**
Labor Force Participation of Single Women
With and Without Children
(Low Education)

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Unemployment Rate

50 60 70 80 90 100

Labor Force Participation (%)

68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04 06 08 10 12 14 16 18

Year

With Children
Without Children

All Educations
Labor Force Participation of Single Women
With and Without Children
(Low Education)

50 years of relative stability, apart from these 5 years

Unemployment Rate

Labor Force Participation (%)

Year

With Children
Without Children

All Educations

87 / 167
Labor Force Participation of Single Women
With and Without Children
(Low Education)

50 years of relative stability, apart from these 5 years

Unemployment Rate

Year

With Children
Without Children

20.8pp 16.8pp

Labor Force Participation (%)
Labor Force Participation of Single Women
With and Without Children
(Low Education)

Year

With Children
Without Children

50 60 70 80 90 100

With Children
Without Children

All Educations

Tax Reduction
Act of 1975
TRA86
OBRA90
OBRA93
PRWORA
ARRA

Labor Force Participation (%)

Unemployment Rate

68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04 06 08 10 12 14 16 18
Labor Force Participation of Single Women
With and Without Children
(Low Education)

All Educations

Tax Reduction Act of 1975
TRAE 86
OBRA 90
OBRA 93
PRWORA
ARRA
State Welfare Waivers

Labor Force Participation (%)

Year

68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04 06 08 10 12 14 16 18

50 60 70 80 90 100

With Children
Without Children
Labor Force Participation of Single Women
With and Without Children
(Low Education)

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All Educations

- **Tax Reduction Act of 1975**
- **TRA86**
- **OBRA90**
- **OBRA93**
- **ARRA**
- **PRWORA**
- **State Welfare Waivers**
Labor Force Participation of Single Women
By Number of Children
(Low Education)

Tax Reduction Act of 1975
TRA86
OBRA90
OBRA93
ARRA

Labor Force Participation (%)
-1
-.5
0
.5
1

Year
0 children
1 child
2 children
3+ children

All Educations

93 / 167
Labor Force Participation of Single Women
By Number of Children
(Low Education)

Much larger increase by those with 3+ kids

Labor Force Participation (%)

Year

0 children 1 child 2 children 3+ children
Labor Force Participation of Single Women
By Number of Children
(Low Education)

Tax Reduction Act of 1975
TRA86
OBRA90
OBRA93
ARRA

But no increase here by those with 3+ kids

40 50 60 70 80 90
Labor Force Participation (%)

0 children 1 child 2 children 3+ children

All Educations

68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04 06 08 10 12 14 16 18
Year
Labor Force Participation of Married Women
With and Without Children (Spousal Earnings Below First Kink)
(Low Education)

Unemployment Rate
With Children
Without Children

Labor Force Participation (%)

Year

Tax Reduction Act of 1975
TRA86
OBRA90
OBRA93
ARRA

All Educations 98 / 167
Labor Force Participation of Married Women
Spousal Earnings Below and Above First Kink (Conditional on Children)
(Low Education)

- Tax Reduction Act of 1975
- TRA86
- OBRA90
- OBRA93
- ARRA
- Unemployment Rate: 2.6 to 4.6
- Labor Force Participation (%): 68 to 98
- Year: 68 to 18

- All Educations 99 / 167
Labor Force Participation of Married Women
With and Without Children (Spousal Earnings Above First Kink)

Tax Reduction Act of 1975
TRA86
OBRA90
OBRA93
ARRA

Unemployment Rate
40 50 60 70 80 90

Labor Force Participation (%)
68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04 06 08 10 12 14 16 18

Year
With Children
Without Children

With Children
Without Children
Labor Force Participation of Single Women
With and Without Children
(Annual Employment)

Tax Reduction Act of 1975

Unemployment Rate

Positive Earnings (%)

Year

With Children

Without Children

LFP
Labor Force Participation of Single Women
With and Without Children
(Annual Employment)

Tax Reduction Act of 1975

Unemployment Rate
Positive Earnings (%)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Annual Employment)

Impact on Positive Earnings (%)

Year

DiD
Unemployment
Labor Force Participation of Single Women
With and Without Children
(Low Education)

Tax Reduction Act of 1975

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Unemployment Rate
50 60 70 80 90

Labor Force Participation (%)
68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85

All Educations
Labor Force Participation of Single Women
With and Without Children
(Low Education)

Tax Reduction Act of 1975

Unemployment Rate

Year

With Children
Without Children
Unemployment

Labor Force Participation (%)

68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85

60 65 70 75 80 85 90 95

4 5 6 7 8 9 10

All Educations

105 / 167
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Low Education)

Tax Reduction Act of 1975

Impact on Labor Force Participation (%)

Year
Labor Force Participation of Married Women
With and Without Children
(Spousal Earnings Below First Kink)

Year | With Children | Without Children
--- | --- | ---
68   | 35            | 45
69   | 36            | 46
70   | 37            | 47
71   | 38            | 48
72   | 39            | 49
73   | 40            | 50
74   | 41            | 51
75   | 42            | 52
76   | 43            | 53
77   | 44            | 54
78   | 45            | 55
79   | 46            | 56
80   | 47            | 57
81   | 48            | 58
82   | 49            | 59
83   | 50            | 60
84   | 51            | 61
85   | 52            | 62
Labor Force Participation of Married Women
With and Without Children
(Spousal Earnings Above First Kink)

Year
With Children
Without Children

Tax Reduction Act of 1975
Labor Force Participation of Married Women

Triple-Diff: With and Without Children, Below and Above Kink

Tax Reduction Act of 1975

Impact on Labor Force Participation (%)
Bastian Replication
Single Women and Married Women with Spousal Earnings Below EITC Exhaustion

![Graph showing positive earnings in percentage over years with and without children. The graph includes a red vertical line indicating the Tax Reduction Act of 1975.](graph.png)
Refining the Specification
Single Women and Married Women with Spousal Earnings Below First EITC Kink

Tax Reduction Act of 1975
Adding the Unemployment Series
Single Women and Married Women with Spousal Earnings Below First EITC Kink

![Graph showing the relationship between Positive Earnings, Unemployment Rate, and Year with children and without children. The graph highlights the Tax Reduction Act of 1975.]
Splitting the Sample

Single Women

Married Women

(Spousal Earnings Below First Kink)
### Married Women Placebo Test

#### Married Women

(Spousal Earnings Below First Kink)

![Graph showing positive earnings and unemployment rates for married women with children and without children with and without children.]

#### Married Women

(Spousal Earnings Above First Kink)

![Graph showing positive earnings and unemployment rates for married women with children and without children with and without children.]

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Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Annual Participation)

Year
Impact on Labor Force Participation (%)
0 5 10 15 20
-5 -10

OBRA93
PRWORA

Weekly Participation
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Annual Participation, Unemployment Controls)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Annual Participation, Unemployment and Welfare Waiver Controls)
Labor Force Participation of Single Women
With and Without Children
(Weekly Employment)

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<td>01</td>
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<tr>
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</tr>
<tr>
<td>03</td>
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</tr>
</tbody>
</table>

Unemployment Rate

- With Children: 8.6
- Without Children: 10.6

Employment Rate (%)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Weekly Employment)

Impact on Employment Rate (%)

Year

OBRA93
PRWORA

Unemployment Rate

-10 -5 0 5 10 15 20

83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03

Weekly Participation
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Weekly Employment, Unemployment Controls)

Impact on Employment Rate (%)

Year

OBRA93
PRWORA

Unemployment Rate
-10
-5
0
5
10
15
20

83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03

Raw Means
With Controls

Weekly Participation
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Weekly Employment, Unemployment and Welfare Waiver Controls)

Impact on Employment Rate (%)

Year

Raw Means
With Controls

Weekly Participation
Labor Force Participation of Single Women
With and Without Children
(Annual Employment)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Annual Employment)

OBRA93
PRWORA

Unemployment Rate

Impact on Positive Earnings (%)

Year

Weekly Participation
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Annual Employment, Unemployment Controls)

Impact on Positive Earnings (%)

Year

OBRA93

PRWORA

8.6

10.6

Unemployment Rate

-10

-5

0

5

10

15

20

Impact on Positive Earnings (%)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Annual Employment, Unemployment and Welfare Waiver Controls)
Labor Force Participation of Single Women
With and Without Children
(Low Education)

<table>
<thead>
<tr>
<th>Year</th>
<th>Unemployment Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With Children</td>
</tr>
<tr>
<td></td>
<td>Without Children</td>
</tr>
<tr>
<td>86</td>
<td>8.6</td>
</tr>
<tr>
<td>90</td>
<td>10.6</td>
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</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Labor Force Participation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>86</td>
<td>83</td>
</tr>
<tr>
<td>90</td>
<td>85</td>
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<td>93</td>
<td>86</td>
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<td>02</td>
<td>89</td>
</tr>
<tr>
<td>03</td>
<td>90</td>
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</tbody>
</table>

All Educations
Labor Force Participation of Single Women

DiD: Difference Between Those With and Without Children

(Low Education)

Impact on Labor Force Participation (%)

Year
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Low Education, Unemployment Controls)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Low Education, Unemployment and Welfare Waiver Controls)
Labor Force Participation of Single Women
With 1 and 2+ Children

Unemployment Rate

Year

1 child

2+ children

With and Without Children
Labor Force Participation of Single Women

DiD: Difference Between Those With 1 and 2+ Children

Impact on Labor Force Participation (%)

Year

With and Without Children
Labor Force Participation of Single Women
DiD: Difference Between Those With 1 and 2+ Children
(Unemployment Controls)

Impact on Labor Force Participation (%)

Year

83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03

OBRA93 PRWORA

Raw Means With Controls

With and Without Children
Labor Force Participation of Single Women
DiD: Difference Between Those With 1 and 2+ Children
(Unemployment and Welfare Waiver Controls)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Any Waiver Approved, Unemployment and Welfare Waiver Controls)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Any Waiver Implemented, Unemployment and Welfare Waiver Controls)
Synthetic States

- **California**: 40% Alabama, 29% Arizona, 27% Nevada, 3% Montana, 2% Washington
- **Connecticut**: 26% Missouri, 14% South Dakota, 9% Texas, 9% Tennessee, 7% Alaska, 35% other states
- **DC**: 54% Alaska, 46% Kentucky
- **Minnesota**: 61% Pennsylvania, 39% Tennessee
- **New Jersey**: 25% Kentucky, 21% Alaska, 18% New Hampshire, 13% Arizona, 11% Montana, 12% other states
- **New York**: 51% Pennsylvania, 49% West Virginia
- **Vermont**: 61% Washington, 31% Arkansas, 8% Pennsylvania
- **Wisconsin**: 53% Washington, 27% Pennsylvania, 20% Missouri
All State EITC Introductions: Event Study
Treatment and Synthetic Control States

Labor Force Participation (%)

Year

Treatments
Synthetic Controls

Large Reforms

138 / 167
All State EITC Introductions: Event Study
DiD: Difference Between Treatment and Synthetic Control States

Impact on Labor Force Participation (%)

Year

Reform

Large Reforms

139 / 167
Large State EITC Reforms: Event Study
Treatment and Synthetic Control States
(Annual Participation)
Large State EITC Reforms: Event Study
DiD: Difference Between Treatment and Synthetic Control States
(Annual Participation)

Impact on Labor Force Participation (%)

Year

Weekly Participation
Large State EITC Reforms: Event Study
Treatment and Synthetic Control States
(Weekly Employment)

Weekly Participation

Reform

Employment Rate (%)

Year

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

-20 -15 -10 -5 0 5 10 15 20

Treatments

Synthetic Controls
Large State EITC Reforms: Event Study
DiD: Difference Between Treatment and Synthetic Control States
(Weekly Employment)

Weekly Participation

Impact on Employment Rate (%) vs. Year
Large State EITC Reforms: Event Study

Treatment and Synthetic Control States

(Annual Employment)

Weekly Participation
Large State EITC Reforms: Event Study
DiD: Difference Between Treatment and Synthetic Control States

(Annual Employment)

Impact on Employment Rate (%) vs. Year

Weekly Participation
Large State EITC Reforms: Event Study
Actual DiD Estimates vs Placebo DiD Estimates

Year
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
Actual Estimates
Placebo Estimates

Back
Labor Force Participation of Single Women
With and Without Children
(Low Education)
Labor Force Participation of Single Women
With and Without Children
(Low Education, Normalized)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Low Education)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Low Education, Adding Linear Pre-Trends)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Low Education, Controlling for Unemployment and Demographics)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Low Education, Adding Pre-Trend Controls)

Impact on Labor Force Participation (%)

Year

WFTC

WTC

Raw Means

With Controls & Pre-Trends

All Educations
Labor Force Participation of Single Women
With and Without Children
(Employment, All Edu)
Labor Force Participation of Single Women
With and Without Children
(Employment, All Educations, Normalized)

With Children
Without Children

Year

Employment Rate (%)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Employment, All Educations)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Employment, All Educations, Adding Linear Pre-Trends)
Labor Force Participation of Single Women

DiD: Difference Between Those With and Without Children

(Employment, All Educations, Controlling for Unemployment and Demographics)
Labor Force Participation of Single Women

DiD: Difference Between Those With and Without Children
(Employment, All Educations, Adding Pre-Trend Controls)
Labor Force Participation of Single Women
With and Without Children
(Employment, Low Education)
Labor Force Participation of Single Women
With and Without Children
(Employment, Low Education, Normalized)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Employment, Low Education)

Impact on Employment Rate (%)

Year

LFP (All Edu)
Labor Force Participation of Single Women

DiD: Difference Between Those With and Without Children
(Employment, Low Education, Adding Linear Pre-Trends)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Employment, Low Education, Controlling for Unemployment and Demographics)
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(Employment, Low Education, Adding Pre-Trend Controls)

Impact on Employment Rate (%)

Year

Raw Means

With Controls & Pre-Trends

LFP (All Edu)
Labor Force Participation of Single Women
With and Without Children
(BHPS, Normalized)

Year
Labor Force Participation (%)
-20 -10 0 10 20
With Children
Without Children
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(BHPS)

Year
Labor Force Participation of Single Women
DiD: Difference Between Those With and Without Children
(BHPS, Controlling for Demographics)

![Graph showing labor force participation over years with and without controls. The graph indicates a comparison of raw means with and without controlling for demographics.]