## Online Appendix (Not for Publication)

# A Supplementary Figures and Tables

**TABLE A.I: HISTORICAL EITC PARAMETERS**

| Year | Family Size | Phase-in Rate (%) | First Kink | Max Credit | Second Kink | Phase-out Rate (%) | Exhaustion Point |
|---|---|---|---|---|---|---|---|
| 1975-78 | all | 10 | 4,000 | 400 | 4,000 | 10.00 | 8,000 |
| 1979-84 | all | 10 | 5,000 | 500 | 6,000 | 12.50 | 10,000 |
| 1985-86 | all | 11 | 5,000 | 550 | 6,500 | 12.22 | 11,000 |
| 1987 | all | 14 | 6,080 | 851 | 6,920 | 10.00 | 15,432 |
| 1988 | all | 14 | 6,240 | 874 | 9,840 | 10.00 | 18,576 |
| 1989 | all | 14 | 6,500 | 910 | 10,240 | 10.00 | 19,340 |
| 1990 | all | 14 | 6,810 | 953 | 10,730 | 10.00 | 20,264 |
| 1991 | 1 child | 16.7 | 7,140 | 1,192 | 11,250 | 11.93 | 21,250 |
| | 2+ children | 17.3 | 7,140 | 1,235 | 11,250 | 12.36 | 21,250 |
| 1992 | 1 child | 17.6 | 7,520 | 1,324 | 11,840 | 12.57 | 22,370 |
| | 2+ children | 18.4 | 7,520 | 1,384 | 11,840 | 13.14 | 22,370 |
| 1993 | 1 child | 18.5 | 7,750 | 1,434 | 12,200 | 13.21 | 23,050 |
| | 2+ children | 19.5 | 7,750 | 1,511 | 12,200 | 13.93 | 23,050 |
| 1994 | 0 children | 7.65 | 4,000 | 306 | 5,000 | 7.65 | 9,000 |
| | 1 child | 26.3 | 7,750 | 2,038 | 11,000 | 15.98 | 23,755 |
| | 2+ children | 30 | 8,425 | 2,528 | 11,000 | 17.68 | 25,296 |
| 1995 | 0 children | 7.65 | 4,100 | 314 | 5,130 | 7.65 | 9,230 |
| | 1 child | 34 | 6,160 | 2,094 | 11,290 | 15.98 | 24,396 |
| | 2+ children | 36 | 8,640 | 3,110 | 11,290 | 20.22 | 26,673 |
| 1996 | 0 children | 7.65 | 4,220 | 323 | 5,280 | 7.65 | 9,500 |
| | 1 child | 34 | 6,330 | 2,152 | 11,610 | 15.98 | 25,078 |
| | 2+ children | 40 | 8,890 | 3,556 | 11,610 | 21.06 | 28,495 |
| 1997 | 0 children | 7.65 | 4,340 | 332 | 5,430 | 7.65 | 9,770 |
| | 1 child | 34 | 6,500 | 2,210 | 11,930 | 15.98 | 25,750 |
| | 2+ children | 40 | 9,140 | 3,656 | 11,930 | 21.06 | 29,290 |
| 1998 | 0 children | 7.65 | 4,460 | 341 | 5,570 | 7.65 | 10,030 |
| | 1 child | 34 | 6,680 | 2,271 | 12,260 | 15.98 | 26,473 |
| | 2+ children | 40 | 9,390 | 3,756 | 12,260 | 21.06 | 30,095 |
| 1999 | 0 children | 7.65 | 4,530 | 347 | 5,670 | 7.65 | 10,200 |
| | 1 child | 34 | 6,800 | 2,312 | 12,460 | 15.98 | 26,928 |
| | 2+ children | 40 | 9,540 | 3,816 | 12,460 | 21.06 | 30,580 |

| Year | Family Size | Phase-in Rate (%) | First Kink | Max Credit | Second Kink | Phase-out Rate (%) | Exhaustion Point |
|---|---|---|---|---|---|---|---|
| 2000 | 0 children | 7.65 | 4,610 | 353 | 5,770 | 7.65 | 10,380 |
| | 1 child | 34 | 6,920 | 2,353 | 12,690 | 15.98 | 27,413 |
| | 2+ children | 40 | 9,720 | 3,888 | 12,690 | 21.06 | 31,152 |
| 2001 | 0 children | 7.65 | 4,760 | 364 | 5,950 | 7.65 | 10,710 |
| | 1 child | 34 | 7,140 | 2,428 | 13,090 | 15.98 | 28,281 |
| | 2+ children | 40 | 10,020 | 4,008 | 13,090 | 21.06 | 32,121 |
| 2002 | 0 children | 7.65 | 4,910 | 376 | 6,150 | 7.65 | 11,060 |
| | 1 child | 34 | 7,370 | 2,506 | 13,520 | 15.98 | 29,201 |
| | 2+ children | 40 | 10,350 | 4,140 | 13,520 | 21.06 | 33,178 |
| 2003 | 0 children | 7.65 | 4,990 | 382 | 6,240 | 7.65 | 11,230 |
| | 1 child | 34 | 7,490 | 2,547 | 13,730 | 15.98 | 29,666 |
| | 2+ children | 40 | 10,510 | 4,204 | 13,730 | 21.06 | 33,692 |
| 2004 | 0 children | 7.65 | 5,100 | 390 | 6,390 | 7.65 | 11,490 |
| | 1 child | 34 | 7,660 | 2,604 | 14,040 | 15.98 | 30,338 |
| | 2+ children | 40 | 10,750 | 4,300 | 14,040 | 21.06 | 34,458 |
| 2005 | 0 children | 7.65 | 5,220 | 399 | 6,530 | 7.65 | 11,750 |
| | 1 child | 34 | 7,830 | 2,662 | 14,370 | 15.98 | 31,030 |
| | 2+ children | 40 | 11,000 | 4,400 | 14,370 | 21.06 | 35,263 |
| 2006 | 0 children | 7.65 | 5,380 | 412 | 6,740 | 7.65 | 12,120 |
| | 1 child | 34 | 8,080 | 2,747 | 14,810 | 15.98 | 32,001 |
| | 2+ children | 40 | 11,340 | 4,536 | 14,810 | 21.06 | 36,348 |
| 2007 | 0 children | 7.65 | 5,590 | 428 | 7,000 | 7.65 | 12,590 |
| | 1 child | 34 | 8,390 | 2,853 | 15,390 | 15.98 | 33,241 |
| | 2+ children | 40 | 11,790 | 4,716 | 15,390 | 21.06 | 37,783 |
| 2008 | 0 children | 7.65 | 5,720 | 438 | 7,160 | 7.65 | 12,880 |
| | 1 child | 34 | 8,580 | 2,917 | 15,740 | 15.98 | 33,995 |
| | 2+ children | 40 | 12,060 | 4,824 | 15,740 | 21.06 | 38,646 |
| 2009 | 0 children | 7.65 | 5,970 | 457 | 7,470 | 7.65 | 13,440 |
| | 1 child | 34 | 8,950 | 3,043 | 16,420 | 15.98 | 35,463 |
| | 2 children | 40 | 12,570 | 5,028 | 16,420 | 21.06 | 40,295 |
| | 3+ children | 45 | 12,570 | 5,657 | 16,420 | 21.06 | 43,279 |
| 2010 | 0 children | 7.65 | 5,980 | 457 | 7,480 | 7.65 | 13,460 |
| | 1 child | 34 | 8,970 | 3,050 | 16,450 | 15.98 | 35,535 |
| | 2 children | 40 | 12,590 | 5,036 | 16,450 | 21.06 | 40,363 |
| | 3+ children | 45 | 12,590 | 5,666 | 16,450 | 21.06 | 43,352 |
| 2011 | 0 children | 7.65 | 6,070 | 464 | 7,590 | 7.65 | 13,660 |

| Year | Family Size | Phase-in Rate (%) | First Kink | Max Credit | Second Kink | Phase-out Rate (%) | Exhaustion Point |
|---|---|---|---|---|---|---|---|
| | 1 child | 34 | 9,100 | 3,094 | 16,690 | 15.98 | 36,052 |
| | 2 children | 40 | 12,780 | 5,112 | 16,690 | 21.06 | 40,964 |
| | 3+ children | 45 | 12,780 | 5,751 | 16,690 | 21.06 | 43,998 |
| 2012 | 0 children | 7.65 | 6,210 | 475 | 7,770 | 7.65 | 13,980 |
| | 1 child | 34 | 9,320 | 3,169 | 17,090 | 15.98 | 36,920 |
| | 2 children | 40 | 13,090 | 5,236 | 17,090 | 21.06 | 41,952 |
| | 3+ children | 45 | 13,090 | 5,891 | 17,090 | 21.06 | 45,060 |
| 2013 | 0 children | 7.65 | 6,370 | 487 | 7,970 | 7.65 | 14,340 |
| | 1 child | 34 | 9,560 | 3,250 | 17,530 | 15.98 | 37,870 |
| | 2 children | 40 | 13,430 | 5,372 | 17,530 | 21.06 | 43,038 |
| | 3+ children | 45 | 13,430 | 6,044 | 17,530 | 21.06 | 46,227 |
| 2014 | 0 children | 7.65 | 6,480 | 496 | 8,110 | 7.65 | 14,590 |
| | 1 child | 34 | 9,720 | 3,305 | 17,830 | 15.98 | 38,511 |
| | 2 children | 40 | 13,650 | 5,460 | 17,830 | 21.06 | 43,756 |
| | 3+ children | 45 | 13,650 | 6,143 | 17,830 | 21.06 | 46,997 |
| 2015 | 0 children | 7.65 | 6,580 | 503 | 8,240 | 7.65 | 14,820 |
| | 1 child | 34 | 9,880 | 3,359 | 18,110 | 15.98 | 39,131 |
| | 2 children | 40 | 13,870 | 5,548 | 18,110 | 21.06 | 44,454 |
| | 3+ children | 45 | 13,870 | 6,242 | 18,110 | 21.06 | 47,747 |
| 2016 | 0 children | 7.65 | 6,610 | 506 | 8,270 | 7.65 | 14,880 |
| | 1 child | 34 | 9,920 | 3,373 | 18,190 | 15.98 | 39,296 |
| | 2 children | 40 | 13,931 | 5,572 | 18,190 | 21.06 | 44,648 |
| | 3+ children | 45 | 13,930 | 6,269 | 18,190 | 21.06 | 47,955 |
| 2017 | 0 children | 7.65 | 6,670 | 510 | 8,340 | 7.65 | 15,010 |
| | 1 child | 34 | 10,000 | 3,400 | 18,340 | 15.98 | 39,617 |
| | 2 children | 40 | 14,040 | 5,616 | 18,340 | 21.06 | 45,007 |
| | 3+ children | 45 | 14,040 | 6,318 | 18,340 | 21.06 | 48,340 |
| 2018 | 0 children | 7.65 | 6,780 | 519 | 8,490 | 7.65 | 15,270 |
| | 1 child | 34 | 10,180 | 3,461 | 18,660 | 15.98 | 40,320 |
| | 2 children | 40 | 14,290 | 5,716 | 18,660 | 21.06 | 45,802 |
| | 3+ children | 45 | 14,290 | 6,431 | 18,660 | 21.06 | 49,194 |

Notes: This table shows federal EITC parameters by family size since the introduction of the program in 1975. The phase-in rate corresponds to the increase in the tax credit for each additional dollar of income. The first kink point is the minimum income needed to maximize the credit. The maximum credit is largest possible EITC amount a family can receive. The second kink point is the maximum income allowed before the credit begins to phase out. The phase-out rate is the reduction in the tax credit for each additional dollar of income above the second kink point. The exhaustion point is the income level at which the EITC is completely phased out.

**TABLE A.II: STATE EITC SUPPLEMENTS**

| State | Year Instituted | At Introduction: % of Fed. Credit | At Introduction: Type | Current: % of Fed. Credit | Current: Type |
|---|---|---|---|---|---|
| Alabama | . | . | . | . | . |
| Alaska | . | . | . | . | . |
| Arizona | . | . | . | . | . |
| Arkansas | . | . | . | . | . |
| California[1] | 2015 | n/a | R | n/a | R |
| Colorado[2] | 1999 | 10 | R | 10 | R |
| Connecticut | 2011 | 25 | R | 23 | R |
| Delaware | 2006 | 20 | NR | 20 | NR |
| Dist. of Columbia | 2000 | 25 | R | 40 | R |
| Florida | . | . | . | . | . |
| Georgia | . | . | . | . | . |
| Hawaii | 2018 | . | . | 20 | NR |
| Idaho | . | . | . | . | . |
| Illinois | 2000 | 5 | NR | 18 | R |
| Indiana[3] | 1999 | n/a | NR | 9 | R |
| Iowa | 1990 | 6.5 | NR | 15 | R |
| Kansas | 1998 | 10 | R | 17 | R |
| Kentucky | . | . | . | . | . |
| Louisiana | 2008 | 3.5 | R | 5 | R |
| Maine | 2000 | 5 | NR | 5 | R |
| Maryland[4] | 1987 | 50 | NR | 28 | R |
| Massachusetts | 1997 | 10 | R | 23 | R |
| Michigan | 2008 | 20 | R | 6 | R |
| Minnesota[5] | 1991 | n/a | R | n/a | R |
| Mississippi | . | . | . | . | . |
| Missouri | . | . | . | . | . |
| Montana | . | . | . | . | . |
| Nebraska | 2005 | 8 | R | 10 | R |
| Nevada | . | . | . | . | . |
| New Hampshire | . | . | . | . | . |
| New Jersey | 2000 | 17.5 | R | 37 | R |
| New Mexico | 2007 | 10 | R | 10 | R |
| New York | 1994 | 20 | R | 30 | R |
| North Carolina[6] | 2008 | 5 | R | . | . |

| State | Year Instituted | At Introduction: % of Fed. Credit | At Introduction: Type | Current: % of Fed. Credit | Current: Type |
|---|---|---|---|---|---|
| North Dakota | . | . | . | . | . |
| Ohio | 2013 | 10 | NR | 10 | NR |
| Oklahoma | 2002 | 5 | R | 5 | NR |
| Oregon[7] | 1997 | 5 | NR | 8 | R |
| Pennsylvania | . | . | . | . | . |
| Rhode Island[8] | 1986 | 25 | NR | 15 | R |
| South Carolina | 2018 | 125 | NR | 125 | NR |
| South Dakota | . | . | . | . | . |
| Tennessee | . | . | . | . | . |
| Texas | . | . | . | . | . |
| Utah | . | . | . | . | . |
| Vermont | 1988 | 28 | R | 36 | R |
| Virginia | 2006 | 20 | NR | 20 | NR |
| Washington[9] | 2008 | n/a | n/a | n/a | n/a |
| West Virginia | . | . | . | . | . |
| Wisconsin[10] | 1989 | 5/25/75 | R | 4/11/34 | R |
| Wyoming | . | . | . | . | . |

Notes: This table shows the years in which state EITC supplements were instituted, along with their parameters 3 years after introduction ("at introduction") and in 2018 ("current"). The notation R and NR refers to whether the credit is refundable or non-refundable.

1. California's EITC is not a percentage of the federal EITC, but is based on an independent schedule similar in structure to the federal schedule. In 2018, the maximum California credit was 45 percent of the maximum federal credit.

2. Colorado's original EITC was contingent upon the state having surplus revenue. In 2015, legislation was enacted that made the credit permanent. Before 2015, it was only paid out between 1999 and 2001.

3. Until 2002, Indiana's EITC was not a percentage of the federal EITC, but was based on an independent schedule similar in structure to the federal schedule. In 2003, Indiana's credit was respecified as a percentage of the federal credit and became refundable.

4. Maryland also offers a 50% non-refundable credit that taxpayers can choose in place of the refundable credit.

5. Minnesota's EITC is not a percentage of the federal EITC, but is based on an independent schedule similar in structure to the federal schedule. In 2018, the maximum Minnesota credit was equal to 25, 30, 35, and 31 percent of the maximum federal credit for families with 0, 1, 2, and 3+ children, respectively.

6. North Carolina's credit was eliminated from 2014.

7. Oregon's EITC is 11% of the federal credit for families with children under three.

8. While Rhode Island explicitly enacted a state EITC in 1986, they already had an implicit EITC from the introduction of the federal credit in 1975. This is because, at that time, the Rhode Island income tax was assessed as a percentage of the federal income tax.

9. Washington enacted a state EITC in 2008, but the credit has never been funded or paid out.

10. Wisconsin introduced a non-refundable EITC already in 1984, which was repealed in 1986 and reinstituted in 1989 as a refundable credit. Wisconsin's credit varies by family size. The numbers shown in the table correspond to the credit for 1, 2, and 3+ eligible children, respectively.

**TABLE A.III: APPROVAL AND IMPLEMENTATION DATES OF STATEWIDE WAIVERS**

| State | Termination Time Limits | | Work Requirement Time Limits | | JOBS Exemptions | | JOBS Sanctions | | Family Caps | | Earnings Disregard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appr | Impl | Appr | Impl | Appr | Impl | Appr | Impl | Appr | Impl | Appr | Impl |
| Alabama | | | | | | | | | | | | |
| Alaska | | | | | | | | | | | | |
| Arizona | 5-95 | 11-95 | | | | 11-95 | 5-95 | 11-95 | 5-95 | 11-95 | | |
| Arkansas | | | | | | | | | 4-94 | 7-94 | | |
| California | | | 9-95 | 9-95 | | | | | 8-96 | | 10-92 | 12-92 |
| Colorado | | | | | | | | | | | | |
| Connecticut | 12-95 | 1-96 | | | 8-94 | 1-96 | 8-94 | 1-96 | 12-95 | 1-96 | 8-94 | 1-96 |
| Delaware | 5-95 | 10-95 | 5-95 | 10-95 | 5-95 | 10-95 | 5-95 | 10-95 | 5-95 | 10-95 | 5-95 | 10-95 |
| Dist. of Columbia | | | | | | | | | | | | |
| Florida | | 2-94 | | | 6-96 | | | | 6-96 | | | 2-94 |
| Georgia | | | | | | | 11-93 | 1-94 | 11-93 | 1-94 | 6-94 | |
| Hawaii | 8-96 | 2-97 | | | 6-94 | 2-97 | | | | | 8-96 | 2-97 |
| Idaho | | | | | 8-96 | | 8-96 | | | | | |
| Illinois | | | | | 9-95 | | 9-95 | 10-95 | 9-95 | 12-95 | 11-93 | 11-93 |
| Indiana | 12-94 | 5-95 | | | 12-94 | 5-95 | 12-94 | 5-95 | 12-94 | 5-95 | | |
| Iowa | 8-93 | 10-93 | | | 8-93 | 10-93 | 8-93 | 10-93 | | | 8-93 | 10-93 |
| Kansas | | | | | | | | | | | | |
| Kentucky | | | | | | | | | | | | |
| Louisiana | | | | | | | | | | | | |
| Maine | | | | | 6-96 | | | | | | | |
| Maryland | | | | | 8-96 | 10-96 | 8-96 | 10-96 | 8-95 | 3-96 | 8-96 | 10-96 |
| Massachusetts | | | 8-95 | 11-95 | 8-95 | 11-95 | 8-95 | 11-95 | 8-95 | 11-95 | 8-95 | 11-95 |
| Michigan | | | 8-92 | | 10-94 | 10-94 | 10-94 | 10-94 | | | 8-92 | 10-92 |
| Minnesota | | | | | | | | | | | | |
| Mississippi | | | | | | | | | 9-95 | 10-95 | | |
| Missouri | | | 4-95 | | | | 4-95 | 6-95 | | | | |

| State | Termination Time Limits | | Work Requirement Time Limits | | JOBS Exemptions | | JOBS Sanctions | | Family Caps | | Earnings Disregard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appr | Impl | Appr | Impl | Appr | Impl | Appr | Impl | Appr | Impl | Appr | Impl |
| Montana | | | 4-95 | 2-96 | 4-95 | 2-96 | 4-95 | 2-96 | | | 4-95 | 2-96 |
| Nebraska | 2-95 | 10-95 | | | 2-95 | 10-95 | 2-95 | 10-95 | 2-95 | 10-95 | 2-95 | |
| Nevada | | | | | | | | | | | | |
| New Hampshire | | | 6-96 | | 6-96 | | 6-96 | | | | 6-96 | |
| New Jersey | | | | | 7-92 | 10-92 | 7-92 | 10-92 | 7-92 | 10-92 | 7-92 | |
| New Mexico | | | | | | | | | | | | |
| New York | | | | | | | | | | | | |
| North Carolina | 2-96 | 7-96 | | | 2-96 | 7-96 | 2-96 | 7-96 | 2-96 | 7-96 | | |
| North Dakota | | | | | | | | 7-96 | | | | 10-96 |
| Ohio | 3-96 | | | | | | 3-96 | 7-96 | | | 3-96 | 7-96 |
| Oklahoma | | | | | | | | | | | | |
| Oregon | 3-96 | 7-96 | | | 7-92 | 2-93 | 3-96 | 7-95 | | | | |
| Pennsylvania | | | | | | | | | | | | |
| Rhode Island | | | | | | | | | | | | |
| South Carolina | 5-96 | | | | 5-96 | | 5-96 | | 5-96 | | | |
| South Dakota | | | 3-94 | 6-94 | | | 3-94 | 6-94 | | | | |
| Tennessee | 7-96 | 10-96 | | | 7-96 | 9-96 | 7-96 | 9-96 | 7-96 | 9-96 | 7-96 | 9-96 |
| Texas | 3-96 | 6-96 | | | 3-96 | 6-96 | 3-96 | 6-96 | | | | |
| Utah | | | | | 10-92 | 1-93 | 10-92 | 1-93 | | | 10-92 | 1-93 |
| Vermont | | | 4-93 | 7-94 | 4-93 | 7-94 | 4-93 | 7-94 | | | 4-93 | 7-94 |
| Virginia | 7-95 | 7-95 | 7-95 | 7-95 | 7-95 | 7-95 | 7-95 | 7-95 | 7-95 | 7-95 | 7-95 | 7-95 |
| Washington | 9-95 | 1-96 | | | | | | | | | | |
| West Virginia | | | | | | | 7-95 | 2-96 | | | | |
| Wisconsin | | | 9-96 | 9-96 | 8-95 | 1-96 | 8-95 | 1-96 | 6-94 | 1-96 | | |
| Wyoming | | | | | | | | | | | | |

Source: Department of Health and Human Services, Assistant Secretary for Planning and Evaluation (1997). *Setting the Baseline: A Report on State Welfare Waivers*.

Notes: This table shows dates of approval and implementation for the six main types of statewide welfare waivers. For waivers that were rolled out at the county level, dates of implementation correspond to the date the first county implemented the reform.

**TABLE A.IV: MAXIMUM MONTHLY AFDC BENEFITS IN 1993 FOR SINGLE MOTHERS, BY NUMBER OF CHILDREN**

| | Monthly Benefit in 1993 (2018 USD) | | | | | | |
|---|---|---|---|---|---|---|---|
| State | One Child | Two Children | Three Children | Four Children | Five Children | Six Children | Seven Children |
| Alabama | 238 | 285 | 337 | 391 | 438 | 499 | 547 |
| Alaska | 1427 | 1604 | 1781 | 1958 | 2136 | 2313 | 2490 |
| Arizona | 478 | 603 | 726 | 850 | 975 | 1098 | 1222 |
| Arkansas | 282 | 355 | 429 | 497 | 575 | 648 | 721 |
| California | 852 | 1055 | 1256 | 1432 | 1609 | 1767 | 1925 |
| Colorado | 488 | 620 | 751 | 891 | 1027 | 1135 | 1243 |
| Connecticut | 822 | 1010 | 1187 | 1357 | 1536 | 1733 | 1915 |
| Delaware | 469 | 587 | 707 | 825 | 945 | 1064 | 1183 |
| Dist. of Columbia | 573 | 730 | 891 | 1027 | 1208 | 1385 | 1531 |
| Florida | 419 | 527 | 633 | 740 | 846 | 954 | 1060 |
| Georgia | 408 | 487 | 573 | 657 | 712 | 772 | 817 |
| Hawaii | 982 | 1237 | 1493 | 1748 | 2004 | 2259 | 2513 |
| Idaho | 436 | 551 | 664 | 779 | 891 | 1006 | 1121 |
| Illinois | 466 | 638 | 719 | 845 | 947 | 997 | 1050 |
| Indiana | 398 | 500 | 601 | 704 | 805 | 907 | 1008 |
| Iowa | 627 | 740 | 860 | 952 | 1060 | 1164 | 1270 |
| Kansas | 612 | 746 | 864 | 970 | 1076 | 1182 | 1288 |
| Kentucky | 341 | 396 | 495 | 579 | 653 | 728 | 728 |
| Louisiana | 240 | 330 | 407 | 481 | 549 | 612 | 679 |
| Maine | 542 | 726 | 914 | 1098 | 1284 | 1470 | 1656 |
| Maryland | 497 | 636 | 766 | 888 | 977 | 1098 | 1208 |
| Massachusetts | 845 | 1006 | 1161 | 1321 | 1484 | 1644 | 1802 |
| Michigan | 645 | 798 | 978 | 1145 | 1376 | 1508 | 1640 |
| Minnesota | 759 | 924 | 1079 | 1211 | 1343 | 1477 | 1592 |
| Mississippi | 167 | 209 | 250 | 292 | 334 | 375 | 417 |
| Missouri | 407 | 507 | 594 | 674 | 749 | 824 | 893 |
| Montana | 553 | 697 | 841 | 985 | 1130 | 1272 | 1418 |

| State | Monthly Benefit in 1993 (2018 USD) | | | | | | |
|---|---|---|---|---|---|---|---|
| | One Child | Two Children | Three Children | Four Children | Five Children | Six Children | Seven Children |
| Nebraska | 509 | 633 | 756 | 879 | 1003 | 1126 | 1249 |
| Nevada | 500 | 605 | 709 | 813 | 916 | 1020 | 1124 |
| New Hampshire | 836 | 956 | 1065 | 1170 | 1310 | 1420 | 1583 |
| New Jersey | 560 | 737 | 848 | 959 | 1070 | 1176 | 1265 |
| New Mexico | 492 | 620 | 749 | 876 | 1004 | 1133 | 1262 |
| New York | 813 | 1003 | 1194 | 1390 | 1536 | 1755 | 1913 |
| North Carolina | 410 | 473 | 516 | 563 | 606 | 648 | 671 |
| North Dakota | 579 | 711 | 871 | 989 | 1091 | 1163 | 1237 |
| Ohio | 485 | 593 | 732 | 857 | 954 | 1065 | 1182 |
| Oklahoma | 436 | 563 | 699 | 817 | 935 | 1053 | 1157 |
| Oregon | 686 | 799 | 982 | 1147 | 1312 | 1460 | 1607 |
| Pennsylvania | 549 | 700 | 864 | 1024 | 1164 | 1309 | 1453 |
| Rhode Island | 780 | 963 | 1098 | 1234 | 1390 | 1529 | 1686 |
| South Carolina | 276 | 348 | 417 | 488 | 558 | 629 | 700 |
| South Dakota | 660 | 747 | 831 | 918 | 1004 | 1090 | 1173 |
| Tennessee | 247 | 321 | 393 | 459 | 530 | 600 | 671 |
| Texas | 275 | 320 | 384 | 427 | 494 | 535 | 610 |
| Utah | 577 | 719 | 841 | 958 | 1055 | 1105 | 1157 |
| Vermont | 911 | 1093 | 1234 | 1390 | 1491 | 1661 | 1809 |
| Virginia | 401 | 506 | 603 | 712 | 756 | 756 | 756 |
| Washington | 765 | 949 | 1116 | 1286 | 1461 | 1687 | 1868 |
| West Virginia | 349 | 433 | 542 | 626 | 718 | 801 | 829 |
| Wisconsin | 765 | 900 | 1074 | 1230 | 1331 | 1441 | 1527 |
| Wyoming | 556 | 626 | 678 | 782 | 886 | 999 | 1112 |
| Median | 509 | 636 | 756 | 888 | 1004 | 1105 | 1222 |

Source: U.S. House of Representatives, Committee on Ways and Means (1993). *Green Book: Background Material and Data on Programs within the Jurisdiction of the Committee on Ways and Means*.

Notes: This table shows the AFDC benefit for families with zero countable income by number of children and state in 1993. For states whose benefits vary across counties, the most generous benefit is listed. All families include 1 adult caretaker.

## TABLE A.V: EXTENSIVE MARGIN ELASTICITIES WHEN IGNORING CONFOUNDERS
DEMOGRAPHIC CONTROLS

| | Earnings and Tax Parameters | | | Employment Effects | | | Participation Effects | | |
|---|---|---|---|---|---|---|---|---|---|
| | Earnings | $\tau$ | $\Delta(1-\tau)$ | $P$ | $\Delta P$ | $\varepsilon$ | $P$ | $\Delta P$ | $\varepsilon$ |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| **Any Children:** | 14,685 | 0.399 | 0.077 | 0.610 | 0.113 | **1.46** | 0.691 | 0.115 | **1.31** |
| **1 Child:** | 16,197 | 0.387 | 0.034 | 0.681 | 0.079 | **2.07** | 0.756 | 0.079 | **1.87** |
| **2 Children** | 14,703 | 0.404 | 0.105 | 0.613 | 0.124 | **1.15** | 0.695 | 0.126 | **1.03** |
| **3 Children:** | 12,110 | 0.414 | 0.124 | 0.477 | 0.164 | **1.62** | 0.570 | 0.175 | **1.45** |
| **4+ Children:** | 8,327 | 0.428 | 0.159 | 0.318 | 0.211 | **2.39** | 0.413 | 0.208 | **1.80** |

Notes: This table shows estimates of the extensive margin elasticities based on the 1993 reform, assuming that the entire DiD effect between 1993-2003 (controlling for demographic changes) can be attributed to the EITC. Columns (1)-(3) show predicted earnings and tax parameters, columns (4)-(6) show employment effects, and columns (7)-(9) show participation effects. Each statistic is shown for all single mothers in the first row and separately by number of children in the following rows. The earnings measure in column (1) is based on predicted earnings for non-workers (estimated using equation 3) and actual earnings for workers. The changes in employment and participation rates ($\Delta P$) as well as the EITC-induced change in the net-of-tax rate ($\Delta(1-\tau)$) represent difference-in-differences comparing single women with and without children. The elasticities in columns (6) and (9) are calculated using equation (2). See section C in the appendix for additional details.

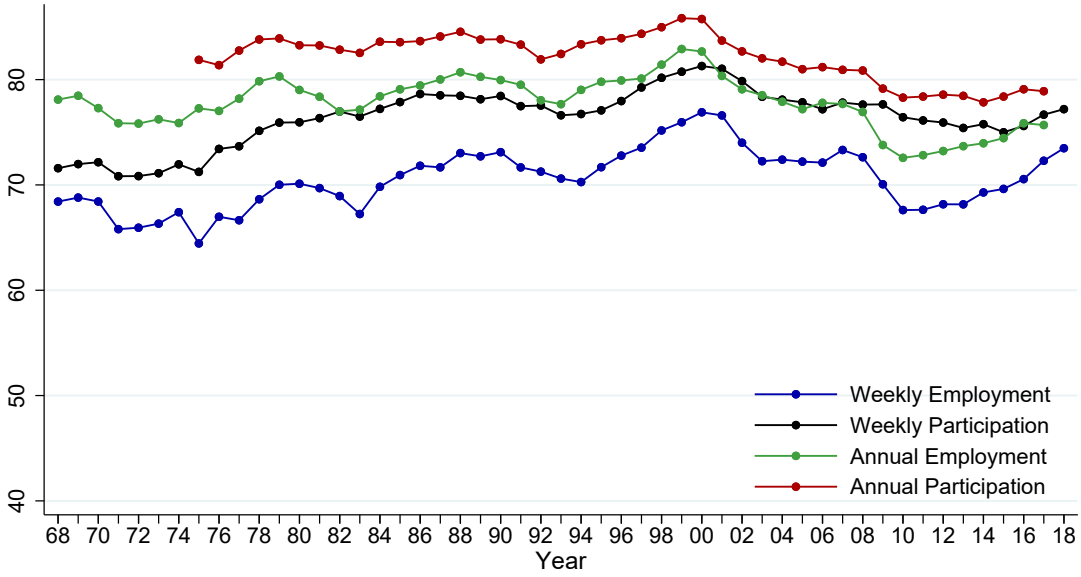
**TABLE A.VI: SYNTHETIC EITC STATES**

| Treated State | Synthetic State |
|---|---|
| California | 49.4% KY, 27.5% UT, 17.8% WV, 4.0% TN, 1.3% WY |
| Colorado | 69.4% SD, 30.6% ID |
| Connecticut | 34.0% SD, 31.3% ND, 27.5% ID, 7.2% NH |
| Delaware | 67.6% MT, 20.7% WY, 8.7% NV, 3.0% UT |
| Dist. Of Columbia | 86.2% WV, 13.8% PA |
| Illinois | 49.2% WA, 17.8% MT, 14.9% PA, 12.1% AK, 5.9% MO |
| Indiana | 71.8% NH, 24.6% UT, 3.3% WV, 0.3% WY |
| Iowa | 51.4% PA, 21.4% MT, 18.2% TX, 8.9% AL |
| Kansas | 52.9% ID, 27.5% UT, 19.5% ND |
| Louisiana | 58.5% MS, 22.4% GA, 19.1% AK |
| Maine | 50.1% UT, 30.0% MT, 18.2% AK, 1.3% AZ, 0.4% ID |
| Maryland | 56.3% MO, 26.5% NV, 17.1% TN |
| Massachusetts | 59.1% PA, 30.4% WV, 10.5% TN |
| Michigan | 46.6% TX, 26.1% AL, 17.6% AK, 9.8% WV |
| Minnesota | 35.9% PA, 23.8% AL, 17.3% WA, 16.8% MT, 6.2% TX |
| Nebraska | 37.9% NH, 30.6% WY, 22.5% UT, 9.0% MT |
| New Jersey | 80.7% PA, 19.3% MO |
| New Mexico | 48.4% AR, 20.0% KY, 15.1% TN, 14.7% FL, 1.8% MS |
| New York | 87.3% WV, 12.7% PA |
| North Carolina | 34.0% SD, 29.5% MS, 17.1% PA, 12.0% AR, 7.4% FL |
| Ohio | 48.7% ID, 27.7% WV, 22.9% UT, 0.8% NV |
| Oklahoma | 44.1% SD, 26.7% WV, 15.7% AK, 12.0% UT, 1.6% WY |
| Oregon | 9.9% SD, 9.6% TN, 9.4% ND, 7.1% UT, 6.1% WV, 57.9% Other |
| Rhode Island | 52.1% WV, 19.9% WA, 14.0% MS, 13.6% TN, 0.4% WY |
| Vermont | 34.6% AR, 33.9% AZ, 31.5% PA |
| Virginia | 80.3% NH, 11.1% WY, 8.6% UT |
| Wisconsin | 43.1% PA, 29.9% FL, 27.0% MT |

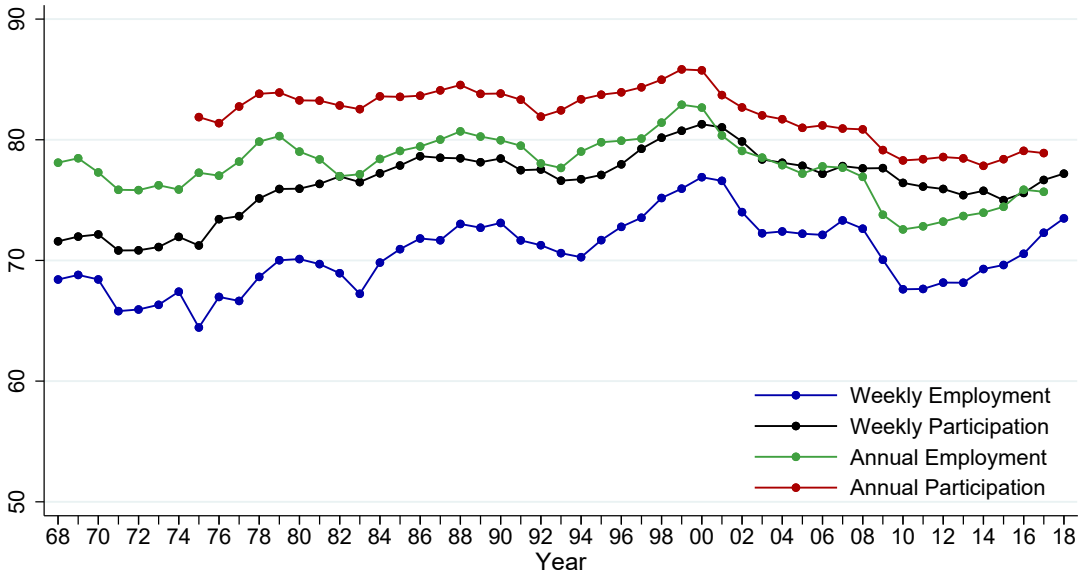
Notes: This table shows how synthetic EITC states in figure (12) are constructed. Each synthetic state is calculated as a linear combination of the set of control states. Values are independently rounded and may not add up to 100%. For synthetic states with more than six control states, remaining states are grouped into an "other" category.

## FIGURE A.I: EXTENSIVE MARGIN MEASURES

### A: All Women, 20-50

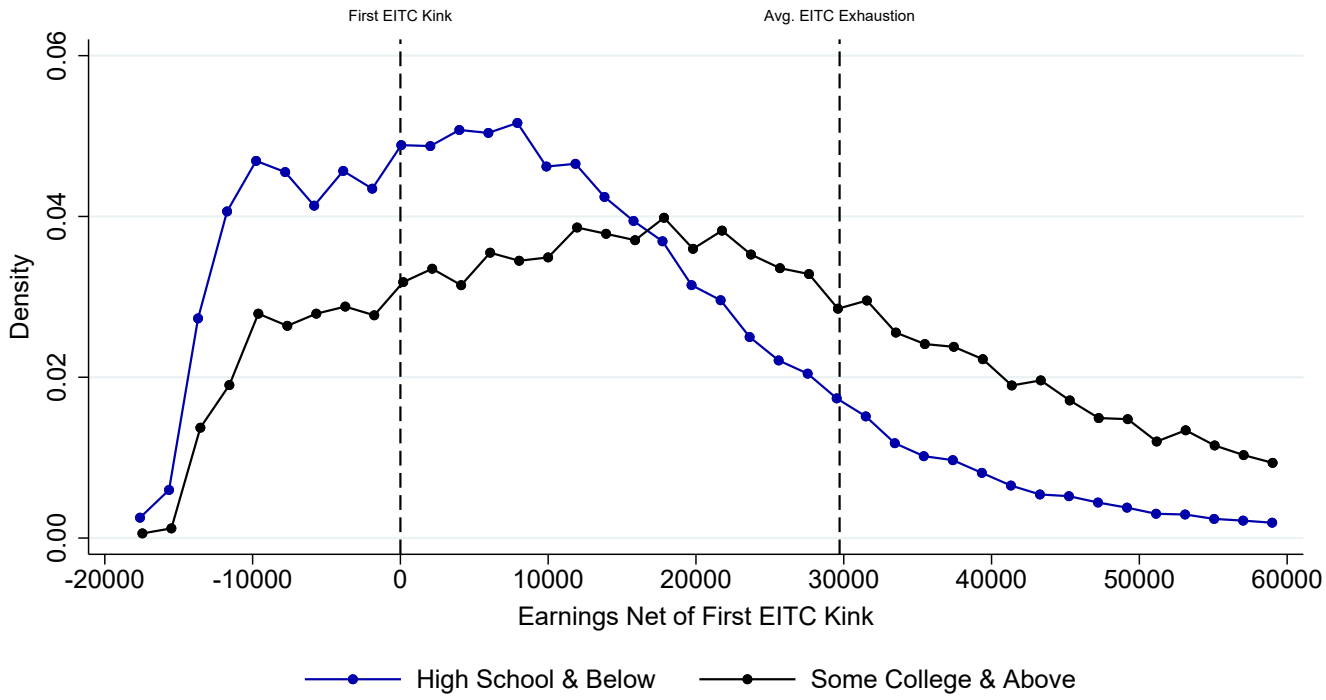



### B: Single Women, 20-50




Notes: This figure shows the weekly employment, weekly participation, annual employment, and annual participation of women (panel A) and single women (panel B) between 1968 and 2018. See section B.1 for additional details. The sample includes women aged 20-50 using the March CPS files.

## FIGURE A.II: EARNINGS DISTRIBUTION OF SINGLE WOMEN WITH CHILDREN

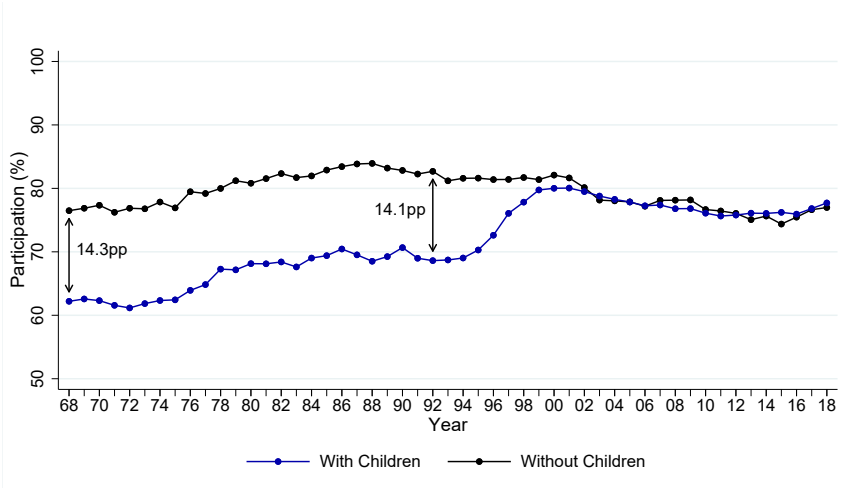



Notes: This figure plots the pooled earnings distribution, from 1975 to 2018, net of the first EITC kink for single mothers of different education levels. All dollar values are in 2018 USD. EITC kink is measured in the same year as earnings. The average EITC exhaustion line corresponds to the average point of EITC exhaustion, relative to the first EITC kink, across all years and observations in the sample. Distributions are divided into 40 quantiles and are plot separately for women with a high school degree or less and with any college education and above. The sample includes single women aged 20-50 using March CPS files alone.

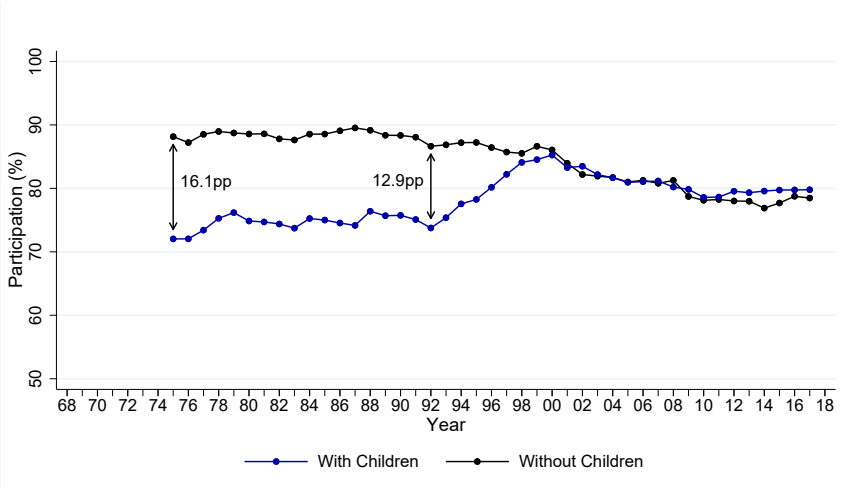
## FIGURE A.III: FIFTY YEARS OF LABOR FORCE PARTICIPATION FOR SINGLE WOMEN

DIFFERENT EXTENSIVE MARGIN MEASURES

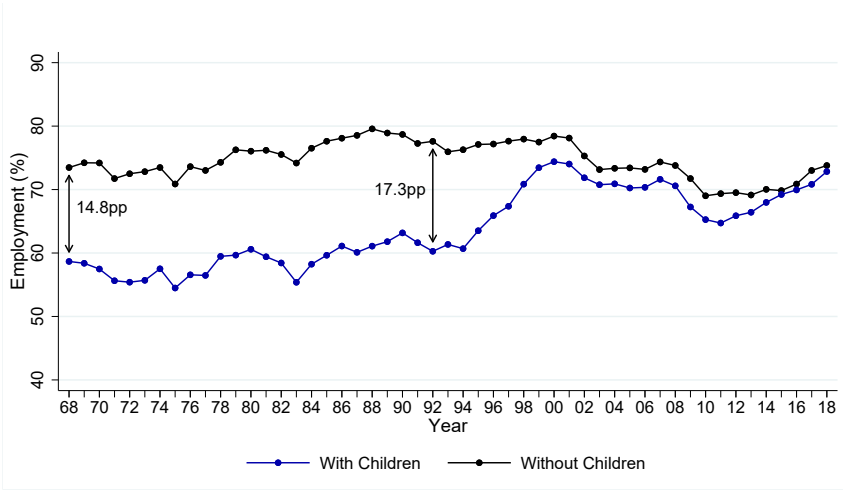
### A: Weekly Participation



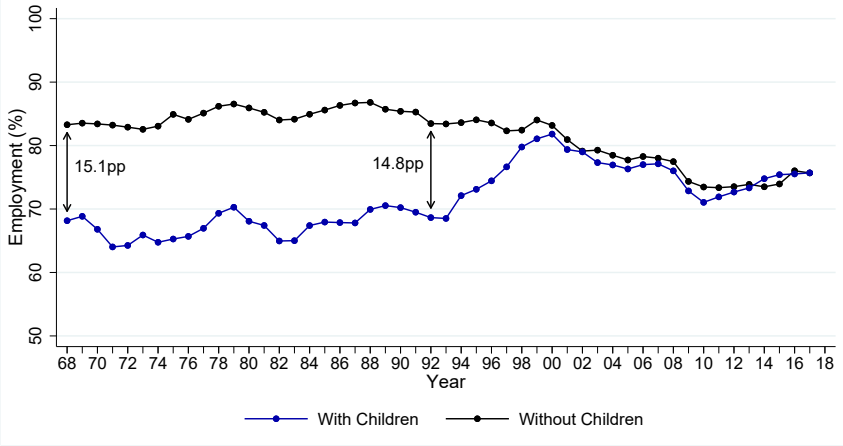

### B: Annual Participation




### C: Weekly Employment




### D: Annual Employment

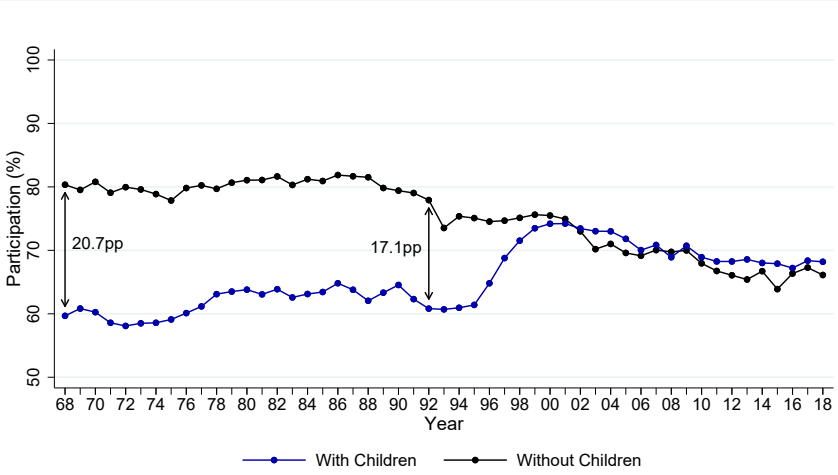



Notes: This figure shows the weekly participation, annual participation, weekly employment, and annual employment rates rate of single women with and without children between 1968 and 2018. The sample includes single women aged 20-50 using the March CPS files.

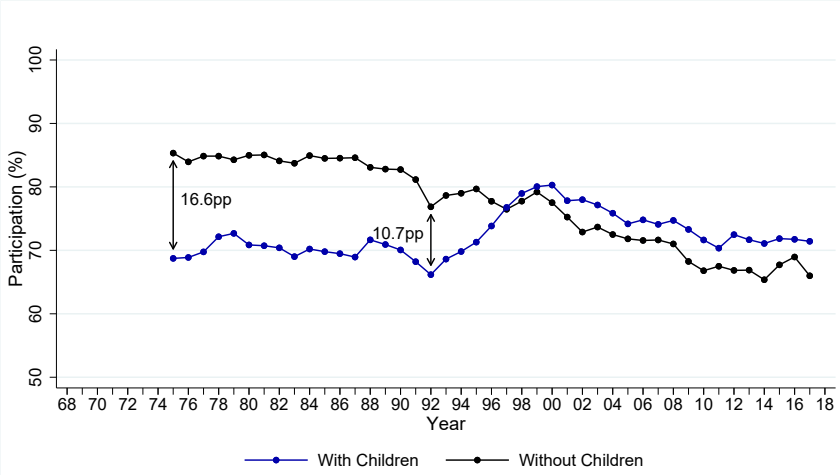
## FIGURE A.IV: FIFTY YEARS OF LABOR FORCE PARTICIPATION FOR SINGLE WOMEN

DIFFERENT EXTENSIVE MARGIN MEASURES, LOW-EDUCATED

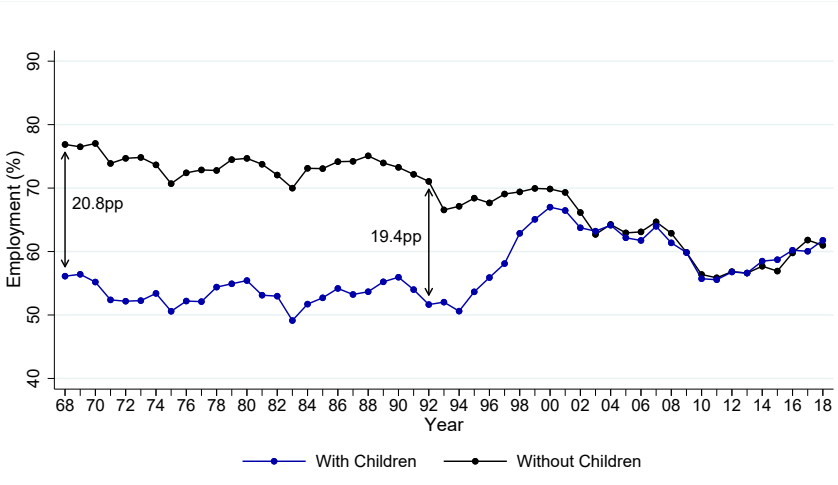
### A: Weekly Participation



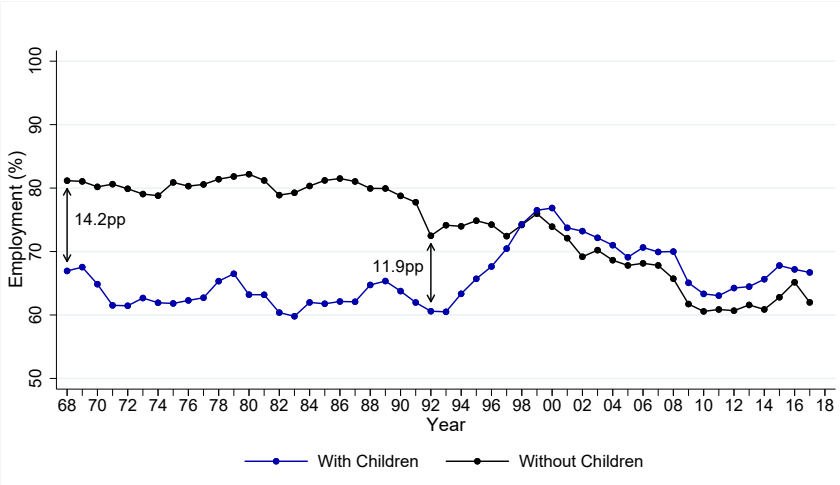

### B: Annual Participation




### C: Weekly Employment




### D: Annual Employment

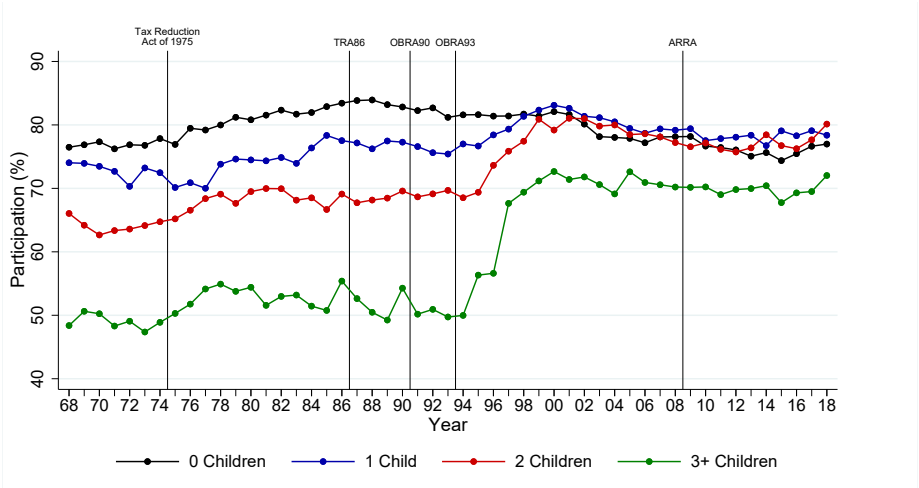



Notes: This figure shows the weekly participation, annual participation, weekly employment, and annual employment rates rate of single women with and without children with a high school degree or less between 1968 and 2018. The sample includes single women aged 20-50 using the March CPS files.

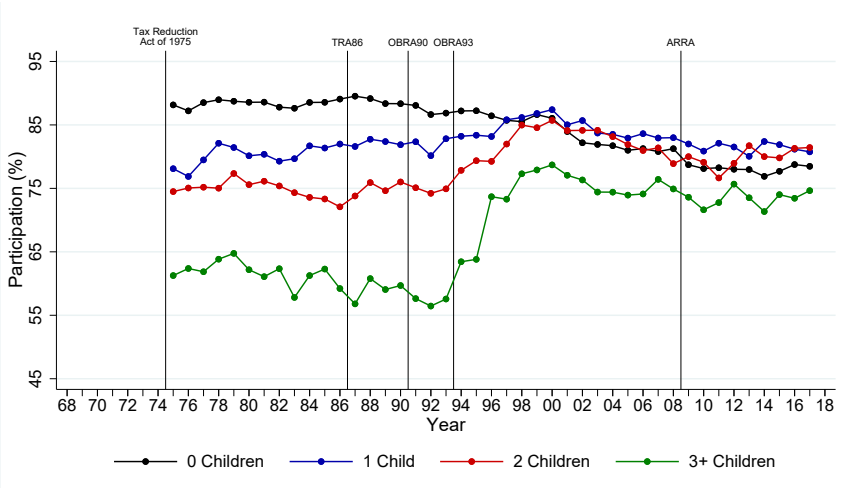
## FIGURE A.V: FIFTY YEARS OF PARTICIPATION FOR SINGLE WOMEN, BY FAMILY SIZE

DIFFERENT EXTENSIVE MARGIN MEASURES

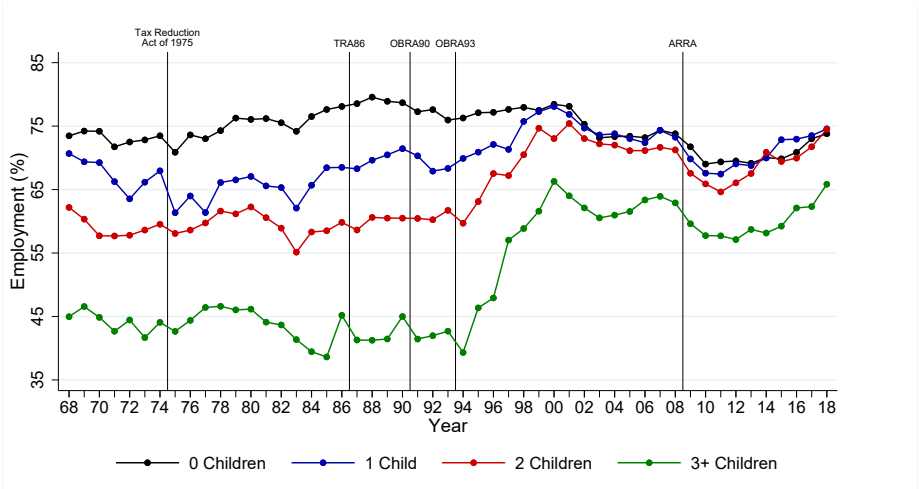
### A: Weekly Participation



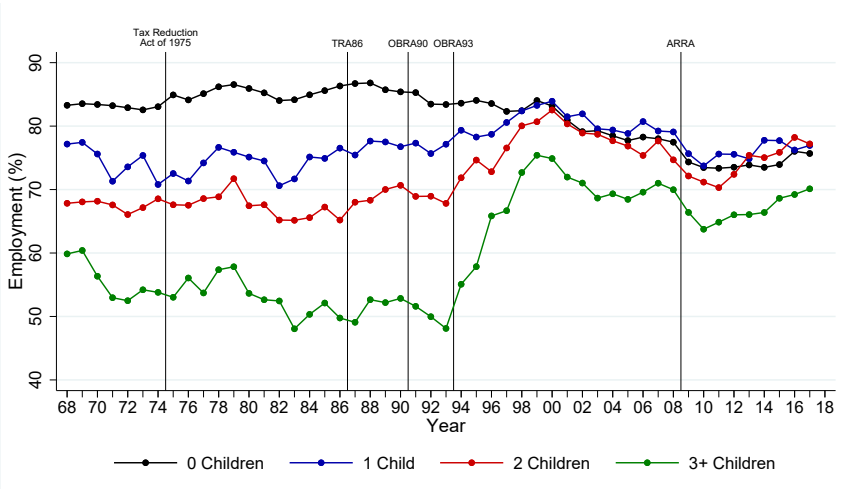

### B: Annual Participation




### C: Weekly Employment




### D: Annual Employment

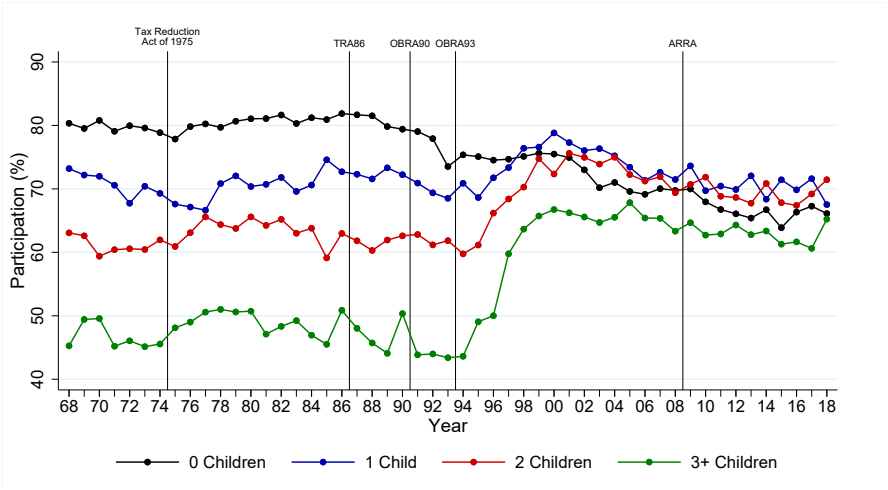



Notes: This figure shows the weekly participation, annual participation, weekly employment, and annual employment rates rate of single women with 0,1, 2, and 3 or more children between 1968 and 2018. The sample includes single women aged 20-50 using the March CPS files.

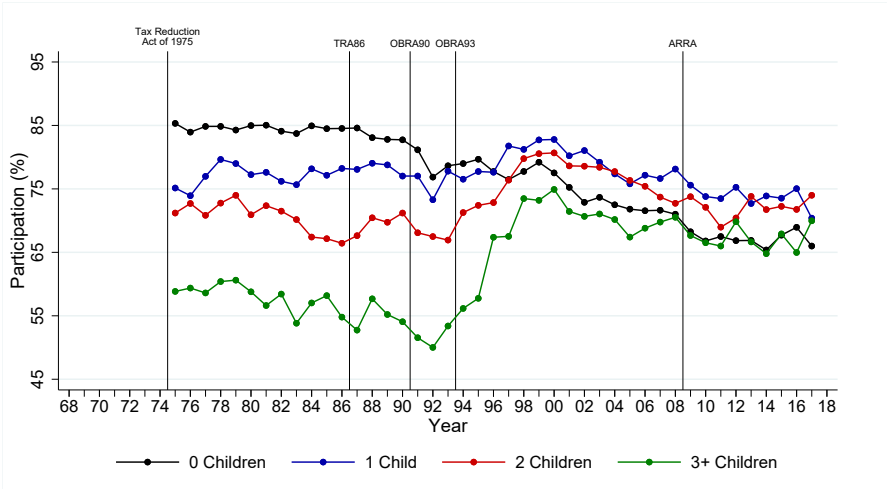
## FIGURE A.VI: FIFTY YEARS OF PARTICIPATION FOR SINGLE WOMEN, BY FAMILY SIZE

DIFFERENT EXTENSIVE MARGIN MEASURES, LOW-EDUCATED

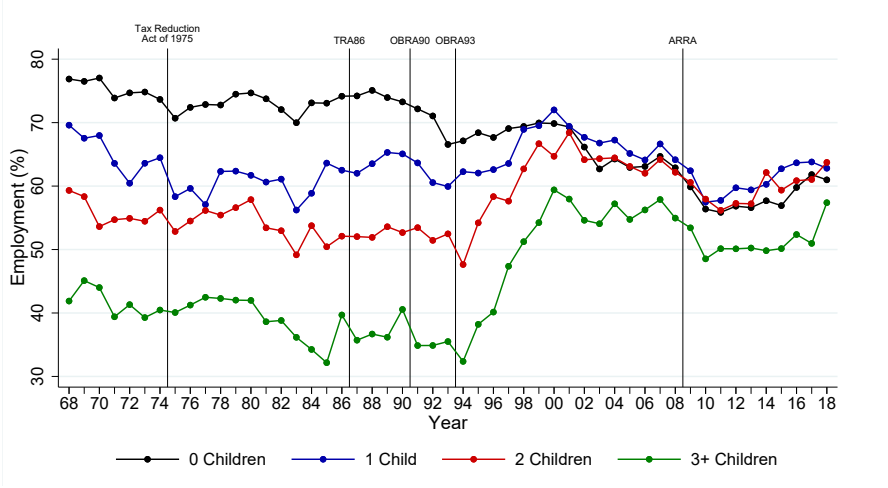
### A: Weekly Participation



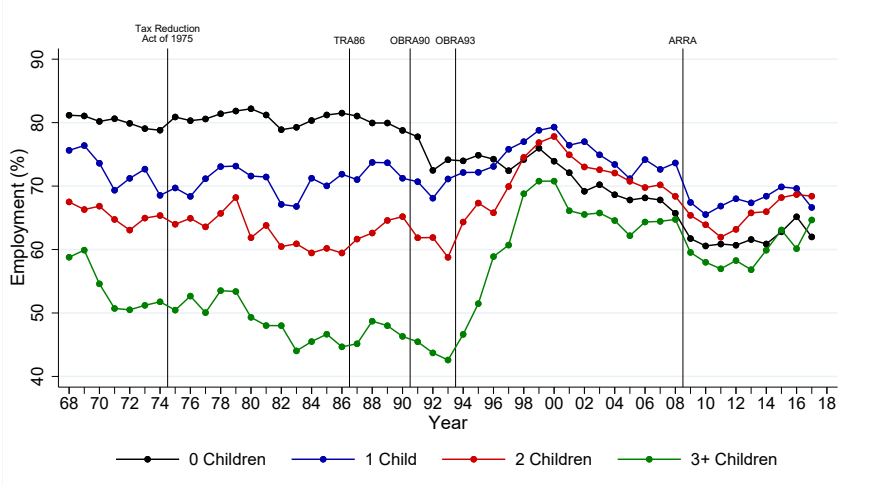

### B: Annual Participation




### C: Weekly Employment

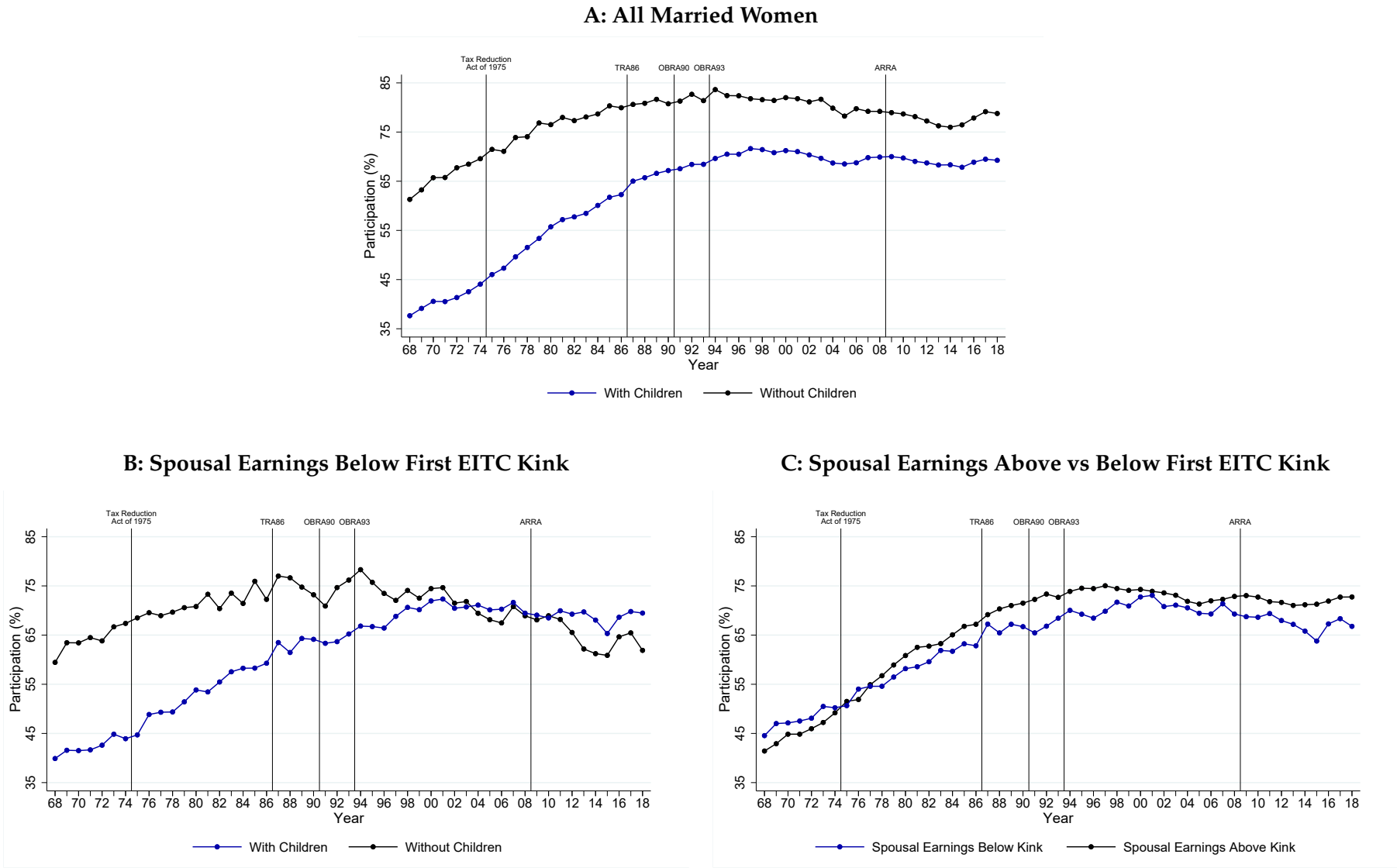



### D: Annual Employment




Notes: This figure shows the weekly participation, annual participation, weekly employment, and annual employment rates rate of single women with 0, 1, 2, and 3 or more with a high school degree or less between 1968 and 2018. The sample includes single women aged 20-50 using the March CPS files.

## FIGURE A.VII: FIFTY YEARS OF PARTICIPATION FOR MARRIED WOMEN

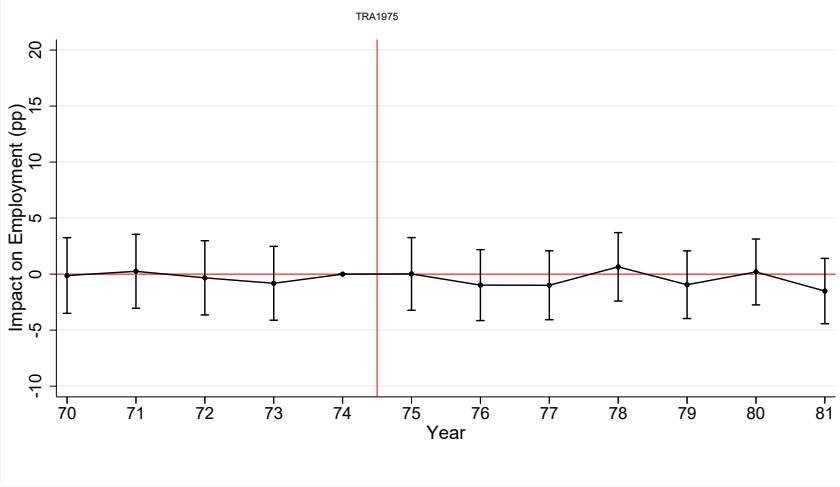



Notes: This figure shows weekly labor force participation of married women between 1968 and 2018. The sample includes married women aged 20-50 using the March CPS files. Panel A compares married women with and without children. Panel B conditions on having spousal earnings below the first EITC kink (for one-child families), and again compares married women with and without children. Panel C conditions on having children, and compares married women with spousal earnings below and above the first EITC kink. Because the EITC is based on joint household income, having spousal earnings below or above the first EITC kink determines whether the policy creates a positive or negative extensive margin incentive. The fact that the two participation series in Panel C track each other over time suggests that there has been no extensive margin impact on married women.

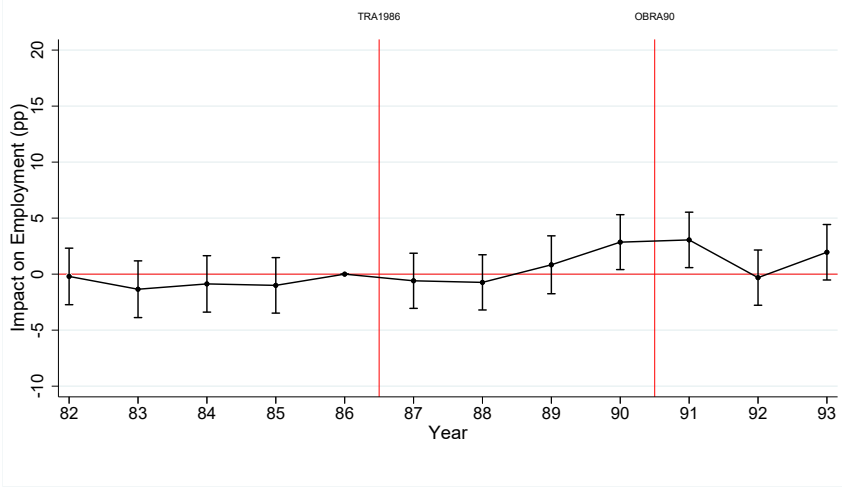
## FIGURE A.VIII: DID EVENT STUDIES OF FEDERAL ALL EITC REFORMS

WEEKLY EMPLOYMENT (DEMOGRAPHIC CONTROLS)

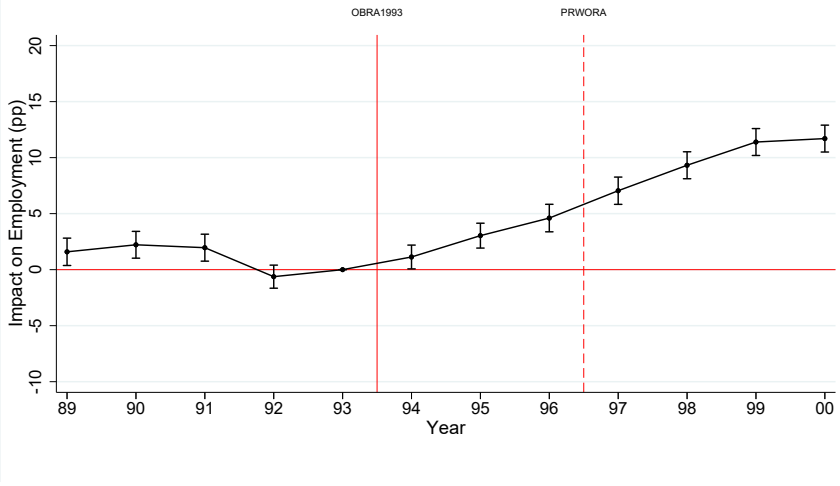
### A: 1975 Reform, With vs Without Children



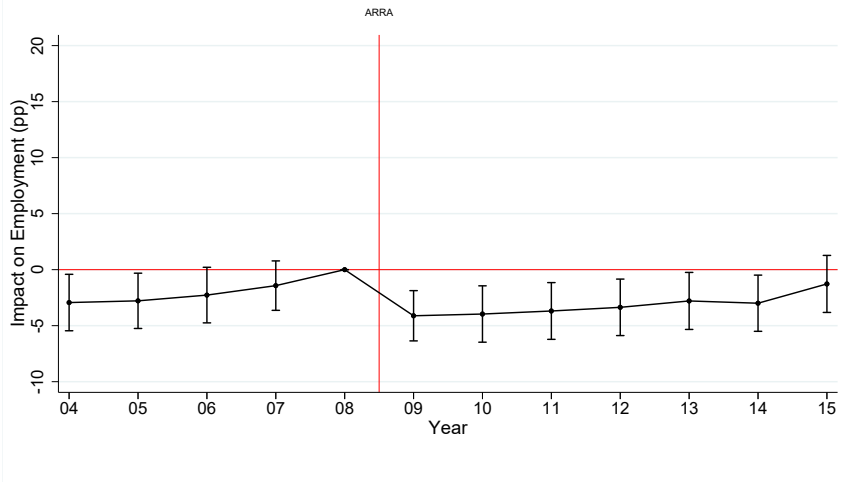

### B: 1986 and 1990 Reforms, With vs Without Children




### C: 1993 Reform, With vs Without Children




### D: 2009 Reform, 3+ vs Without Children

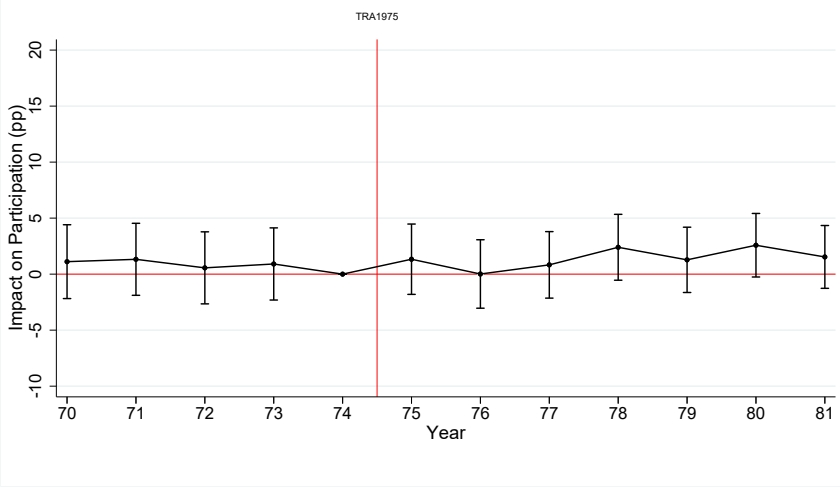



Notes: This figure shows DiD event studies for the five federal EITC reforms. The graphs plot estimates of $\gamma_t$ based on specification (1) that includes controls for demographic composition: dummies for the age of the woman (six categories), dummies for the age of the youngest child (seven categories), and dummies for education (three categories).. Panels A-C are based on comparing single women with and without children, while Panel D is based on comparing single women with 3+ children to those without children. In each panel, the difference in the pre-reform year is normalized to zero. The dependent variable is weekly employment. The sample includes single women aged 20-50. Panels A-B use the March CPS files alone, while Panels C-D use the March and monthly files combined. The 95% confidence intervals are based on robust standard errors clustered at the individual level.

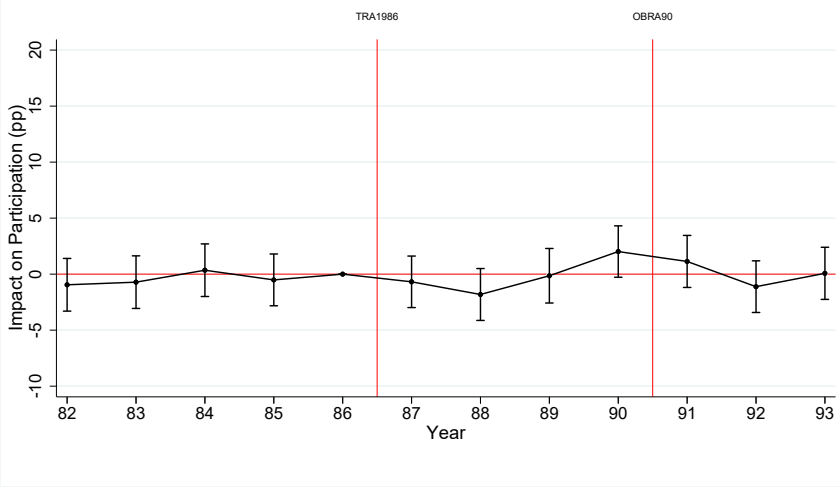
## FIGURE A.IX: DID EVENT STUDIES OF FEDERAL ALL EITC REFORMS

WEEKLY PARTICIPATION (DEMOGRAPHIC CONTROLS)

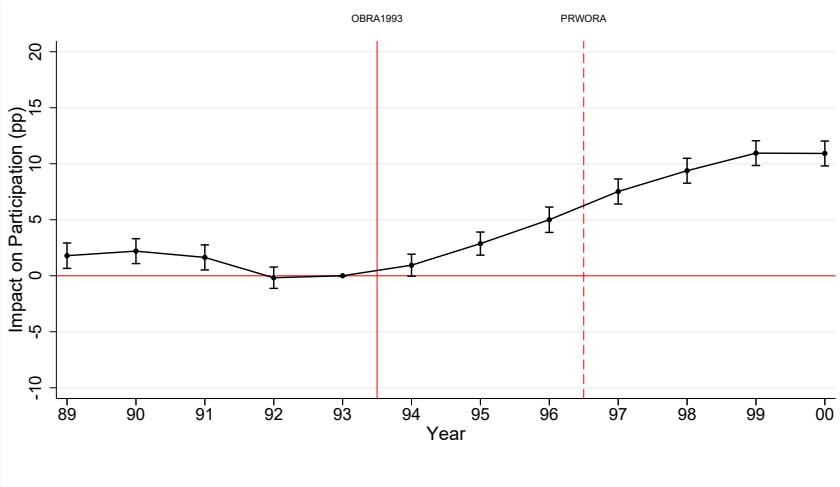
### A: 1975 Reform, With vs Without Children



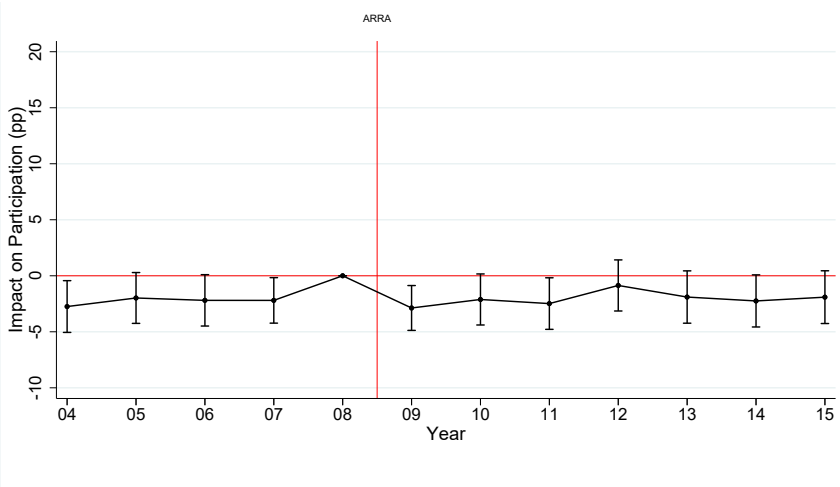

### B: 1986 and 1990 Reforms, With vs Without Children




### C: 1993 Reform, With vs Without Children




### D: 2009 Reform, 3+ vs Without Children

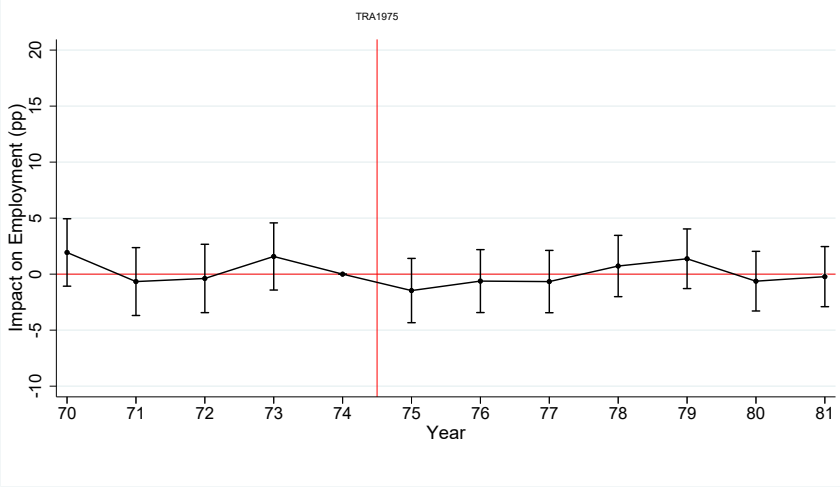



Notes: This figure shows DiD event studies for the five federal EITC reforms. The graphs plot estimates of $\gamma_t$ based on specification (1) that includes controls for demographic composition: dummies for the age of the woman (six categories), dummies for the age of the youngest child (seven categories), and dummies for education (three categories).. Panels A-C are based on comparing single women with and without children, while Panel D is based on comparing single women with 3+ children to those without children. In each panel, the difference in the pre-reform year is normalized to zero. The dependent variable is weekly participation. The sample includes single women aged 20-50. Panels A-B use the March CPS files alone, while Panels C-D use the March and monthly files combined. The 95% confidence intervals are based on robust standard errors clustered at the individual level.

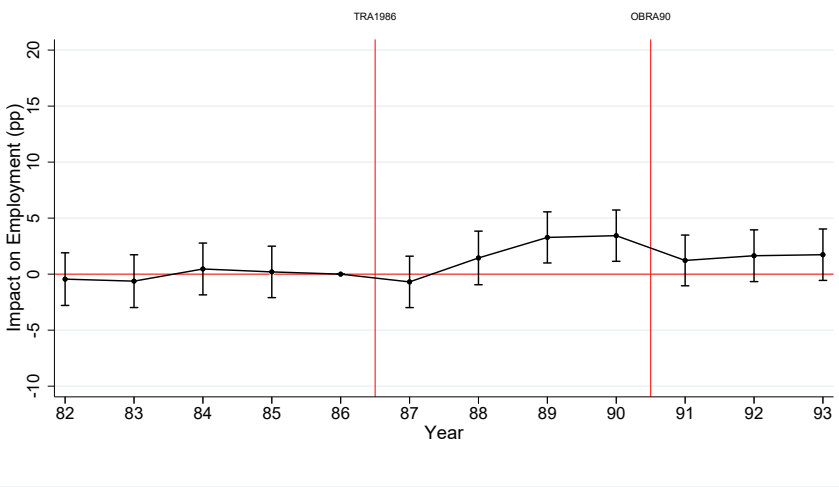
## FIGURE A.X: DID EVENT STUDIES OF FEDERAL ALL EITC REFORMS

ANNUAL EMPLOYMENT (DEMOGRAPHIC CONTROLS)

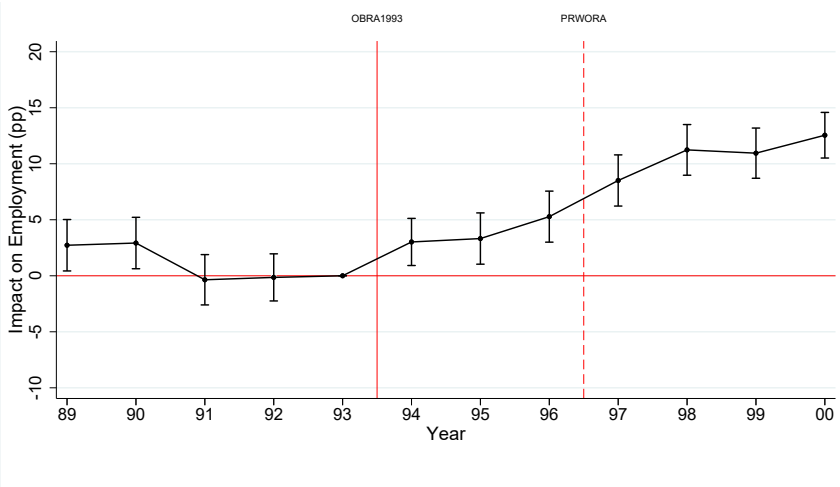
### A: 1975 Reform, With vs Without Children



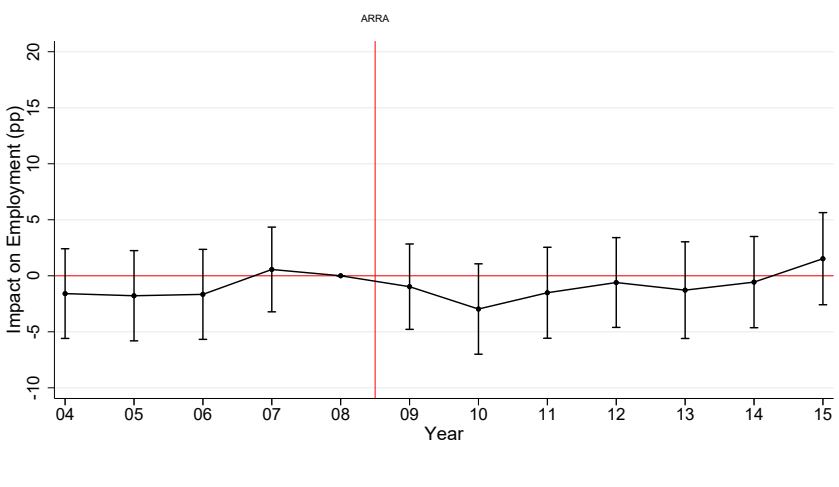

### B: 1986 and 1990 Reforms, With vs Without Children




### C: 1993 Reform, With vs Without Children



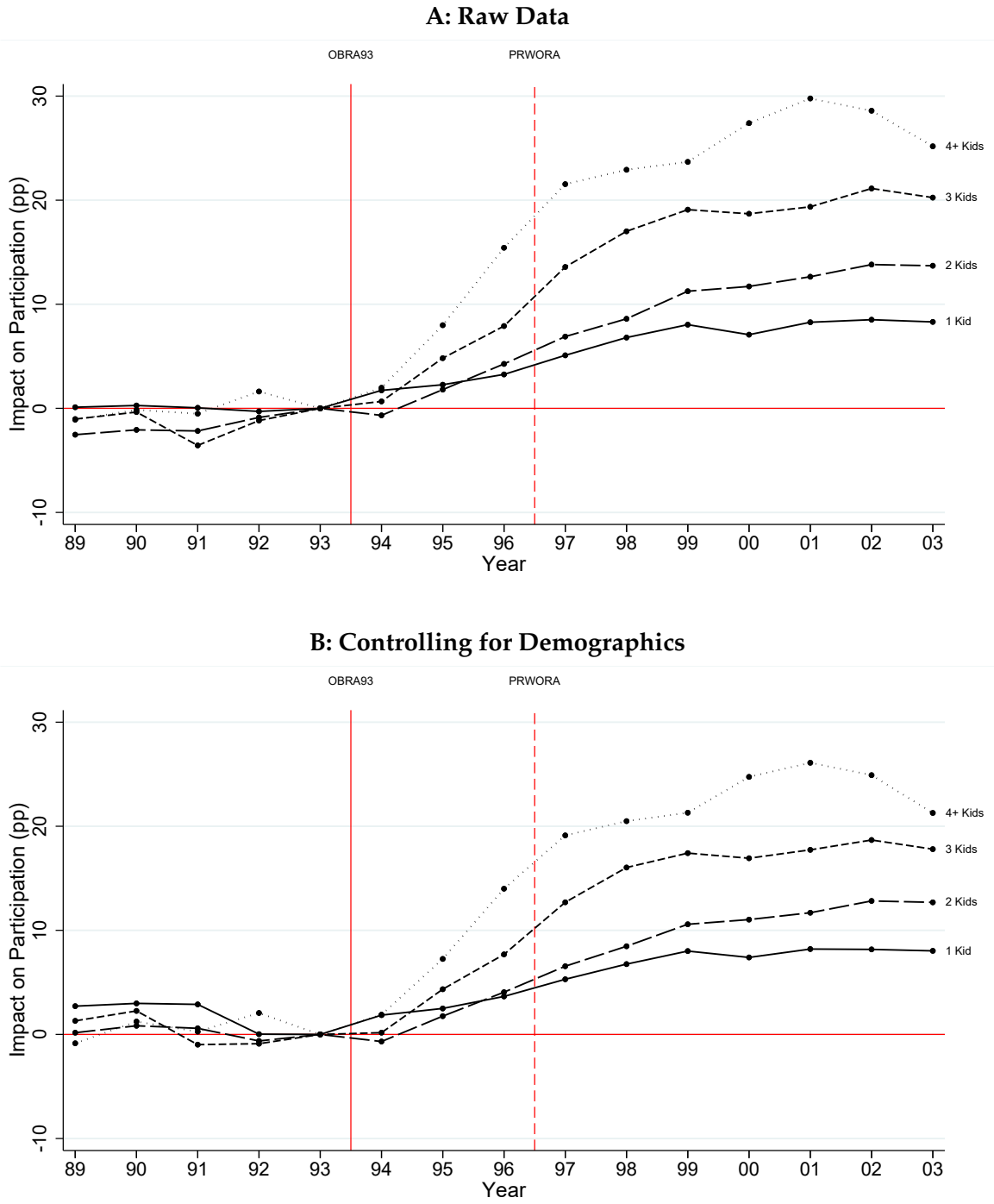

### D: 2009 Reform, 3+ vs Without Children




Notes: This figure shows DiD event studies for the five federal EITC reforms. The graphs plot estimates of $\gamma_t$ based on specification (1) that includes controls for demographic composition: dummies for the age of the woman (six categories), dummies for the age of the youngest child (seven categories), and dummies for education (three categories).. Panels A-C are based on comparing single women with and without children, while Panel D is based on comparing single women with 3+ children to those without children. In each panel, the difference in the pre-reform year is normalized to zero. The dependent variable is annual employment. The sample includes single women aged 20-50 using the March CPS files alone. The 95% confidence intervals are based on robust standard errors clustered at the individual level.

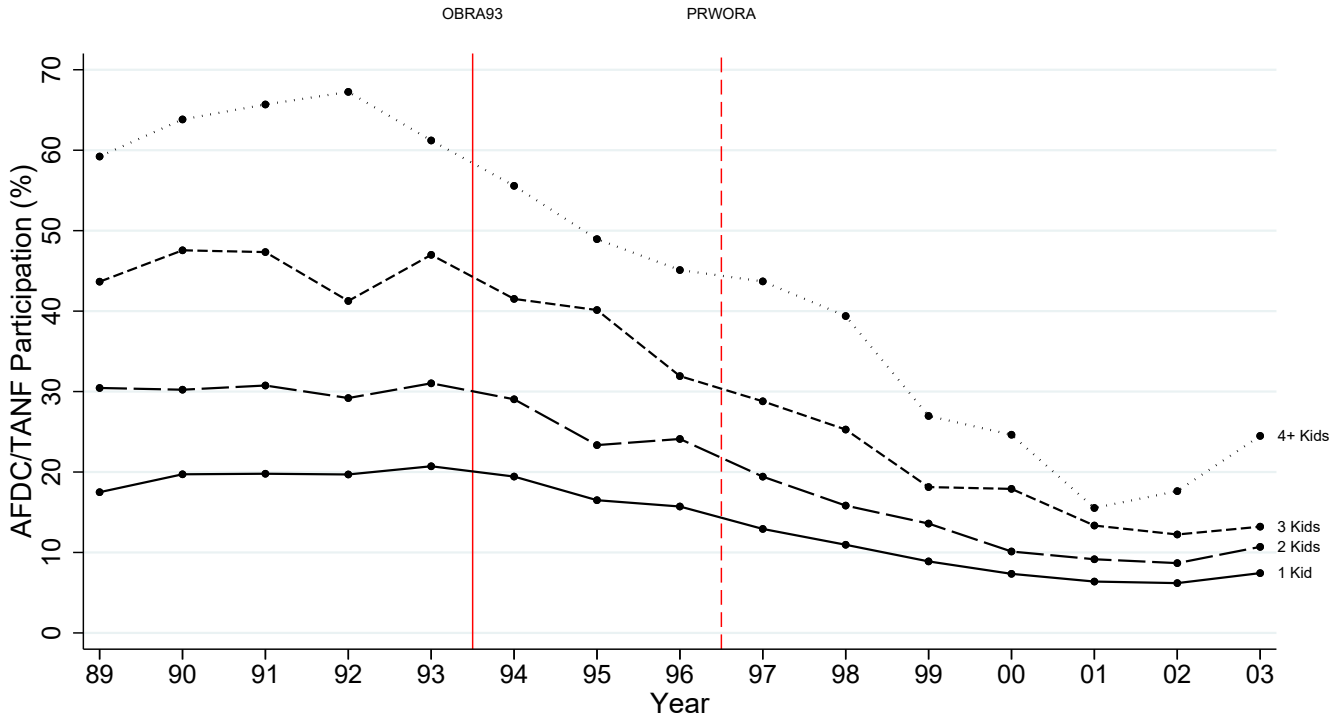
## FIGURE A.XI: A FANNING-OUT BY NUMBER OF CHILDREN

PARTICIPATION




Notes: This figure shows DiD event studies for the 1993 reform by number of EITC-eligible children (1, 2, 3, 4+). The graphs plot DiD coefficients $\gamma_t$ based on an extension of specification (1) that includes dummies for each family size. Hence, each series shows the difference between single mothers with a given number of children and single women without children, normalized to zero in 1993. Panel A shows raw estimates, while panel B controls for demographic composition: dummies for the age of the woman (six categories), dummies for the age of the youngest child (seven categories), and dummies for education (three categories). The dependent variable is weekly participation. The sample includes single women aged 20-50 using the March and monthly CPS files combined.

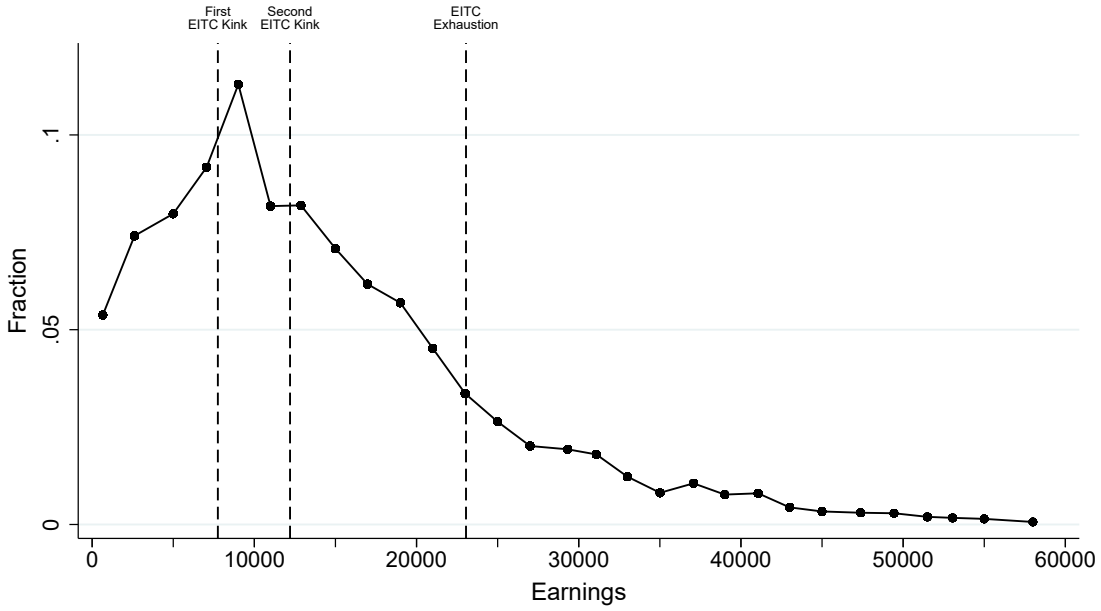
## FIGURE A.XII: AFDC/TANF PARTICIPATION RATES BY NUMBER OF CHILDREN



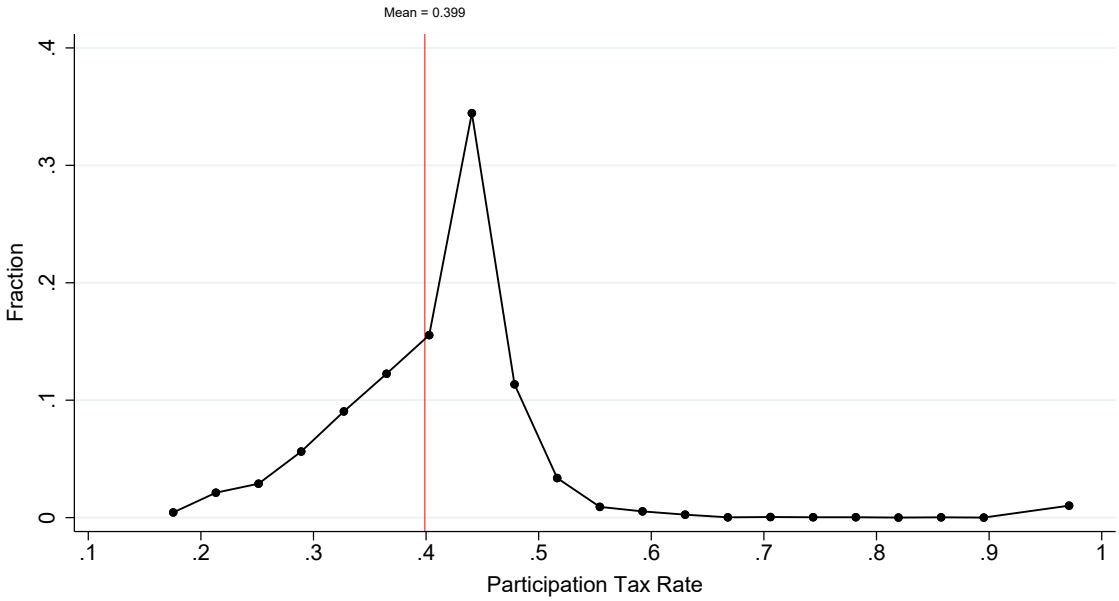

Notes: This figure shows event studies for the 1993 reform by number of EITC-eligible children (1, 2, 3, 4+). The graphs plot DiD coefficients $\gamma_t$ based on an extension of specification (1) without demographic controls that includes dummies for each family size. The dependent variable is annual AFDC/TANF participation. The sample includes single women aged 20-50 using the March files alone.

## FIGURE A.XIII: DISTRIBUTIONS OF EARNINGS AND PARTICIPATION TAX RATES IN 1993

### A: Earnings



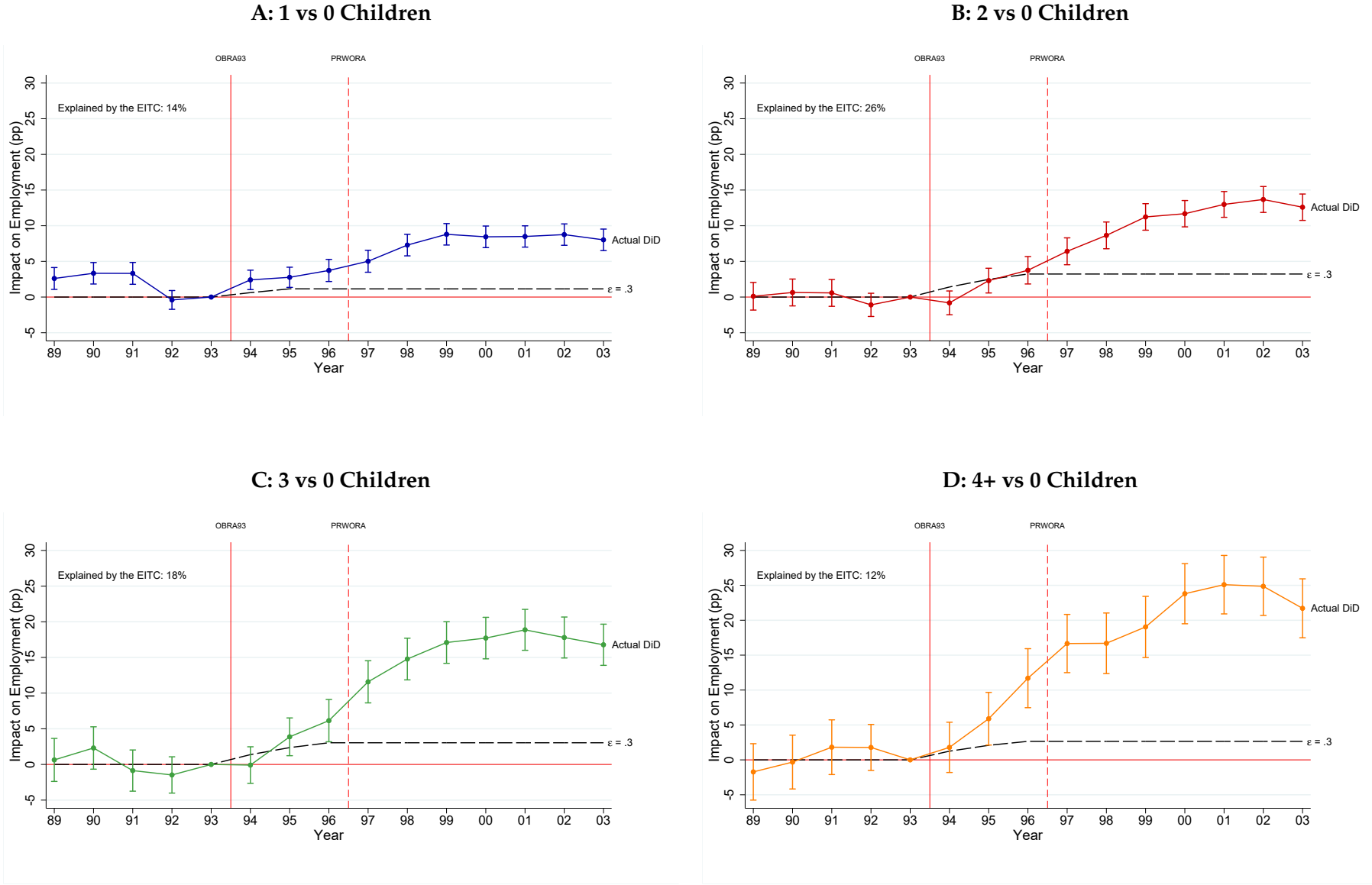

### B: Participation Tax Rates




Notes: This figure shows the distribution of earnings and participation tax rates among single mothers. Panel A shows the earnings distribution using predicted earnings for non-workers (estimated from equation 3) and actual earnings for workers. Panel B shows the distribution of participation tax rates. The sample includes single mothers aged 20-50 using March CPS files from 1992-94 (corresponding to tax years 1991-93).

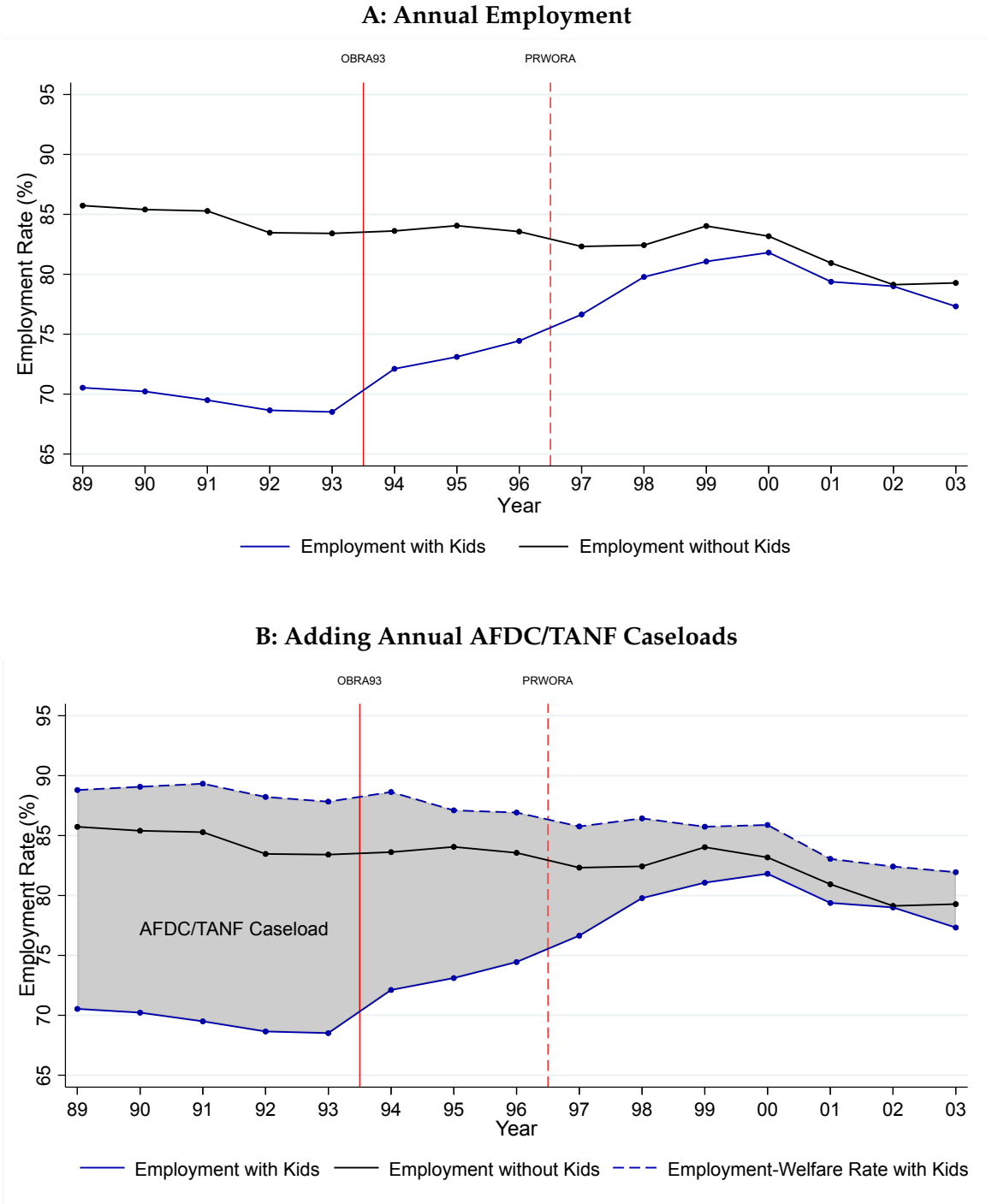
## FIGURE A.XIV: ACTUAL VS SIMULATED RESPONSES TO THE 1993 REFORM

DEMOGRAPHIC CONTROLS




Notes: This figure shows actual and simulated DiD event studies for the 1993 reform, by number of EITC-eligible children. The actual DiD series plot DiD coefficients $\gamma_t$ based on an extension of specification (1) with separate dummies for each family size and controlling for demographics. The specification does not include demographic controls and the dependent variable is weekly employment. The simulated DiD series (black dashed lines) plot $\Delta P_t$ calculated from equation (4), assuming an elasticity of 0.3. See section C in the appendix for additional details. The fraction explained by the EITC equals the simulated DiD estimate in 2003 divided by the actual DiD estimate in 2003. The sample includes single women aged 20-50 using the March and monthly CPS files combined. The 95% confidence intervals are based on robust standard errors clustered at the individual level.

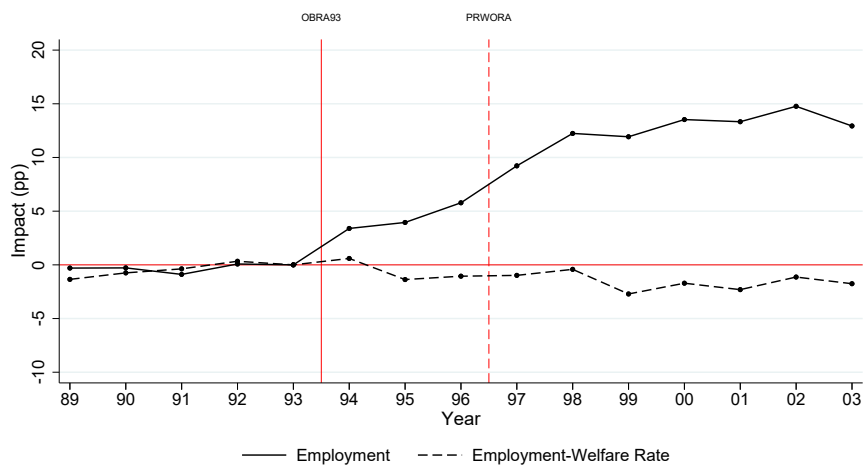
## FIGURE A.XV: EMPLOYMENT VS AFDC/TANF CASELOADS



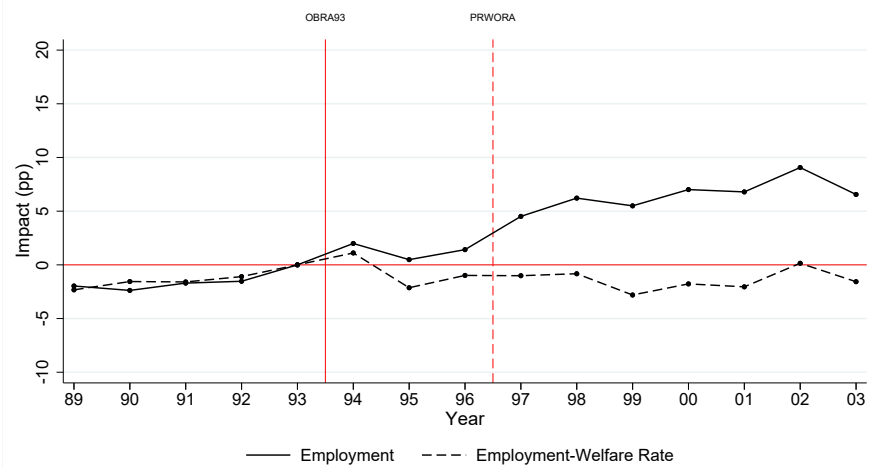

Notes: This figure shows the employment rate (Panel A) and the "employment-welfare rate" (Panel B) for single women with and without children. The employment-welfare rate equals the combined fraction of those who are employed and/or participants in the AFDC/TANF program. For single women without children, AFDC/TANF participation is zero and hence there is no distinction between the employment and employment-welfare rates for this group. The outcome variables are measured at the annual level. The sample includes single women aged 20-50 using March CPS files.

## FIGURE A.XVI: EMPLOYMENT VS AFDC/TANF CASELOADS, BY NUMBER OF CHILDREN

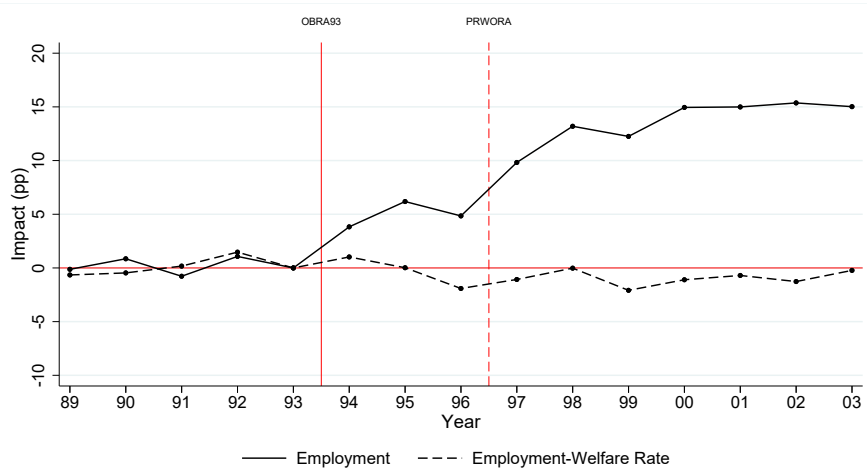
### A: With vs Without Children



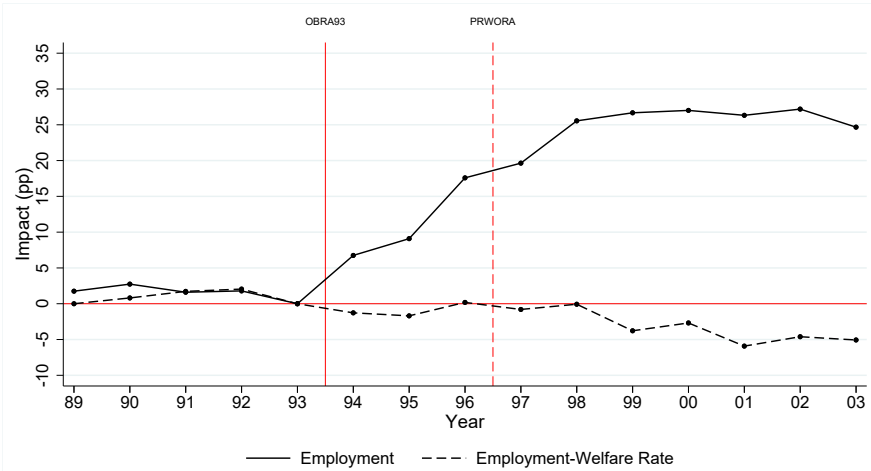

### B: 1 vs 0 Children




### C: 2 vs 0 Children



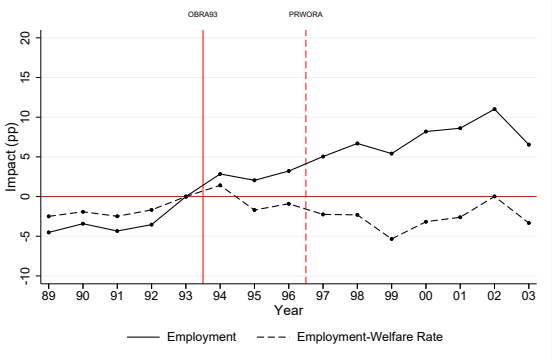

### D: 3+ vs 0 Children



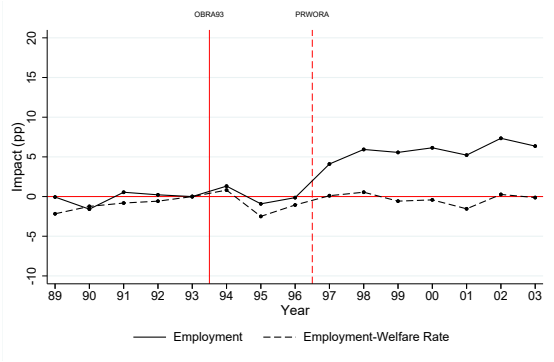

Notes: This figure shows DiD event studies of the 1993 reform by number of children for two different outcomes: the employment rate (solid line) and the employment-welfare rate (dashed line). The estimates are based on an extension of equation (1) that includes separate dummies for each number of children (1, 2, and 3+). The specification does not include demographic controls. The outcome variables (employment or employment/welfare) are measured at the annual level. The sample includes single women aged 20-50 using March CPS files.

## FIGURE A.XVII: EMPLOYMENT VS AFDC/TANF CASELOADS, BY NUMBER OF CHILDREN AND AGE OF YOUNGEST CHILD

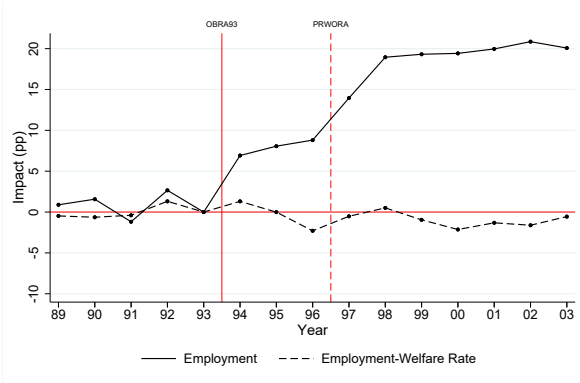
### A: 1 Child, Youngest Aged 0-7



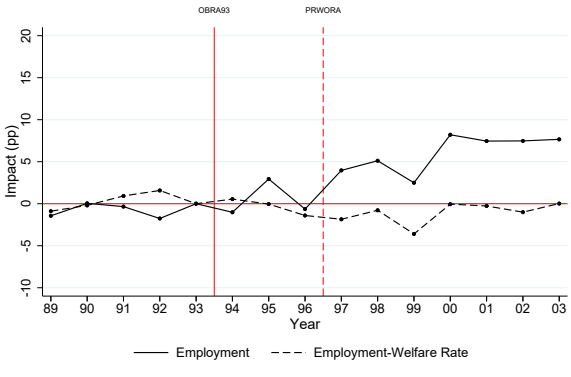

### B: 1 Child, Youngest Aged 8-18



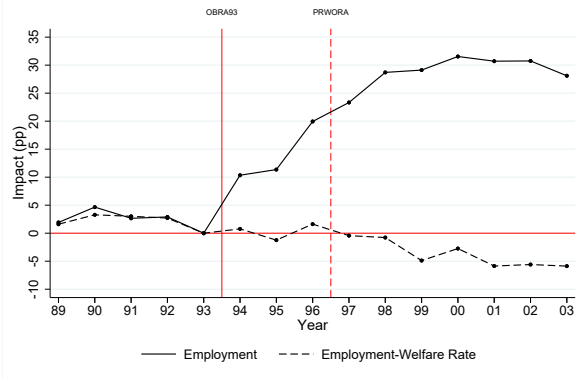

### C: 2 Children, Youngest Aged 0-7



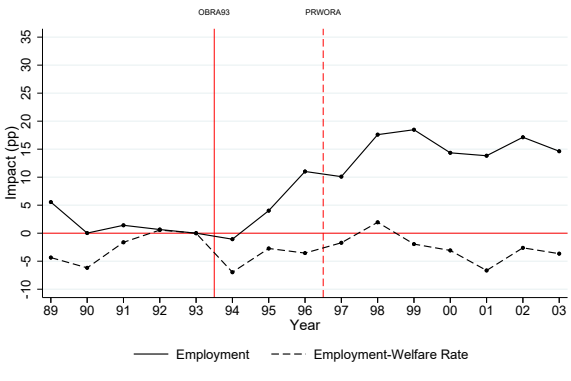

### D: 2 Children, Youngest Aged 8-18




### E: 3+ Children, Youngest Aged 0-7

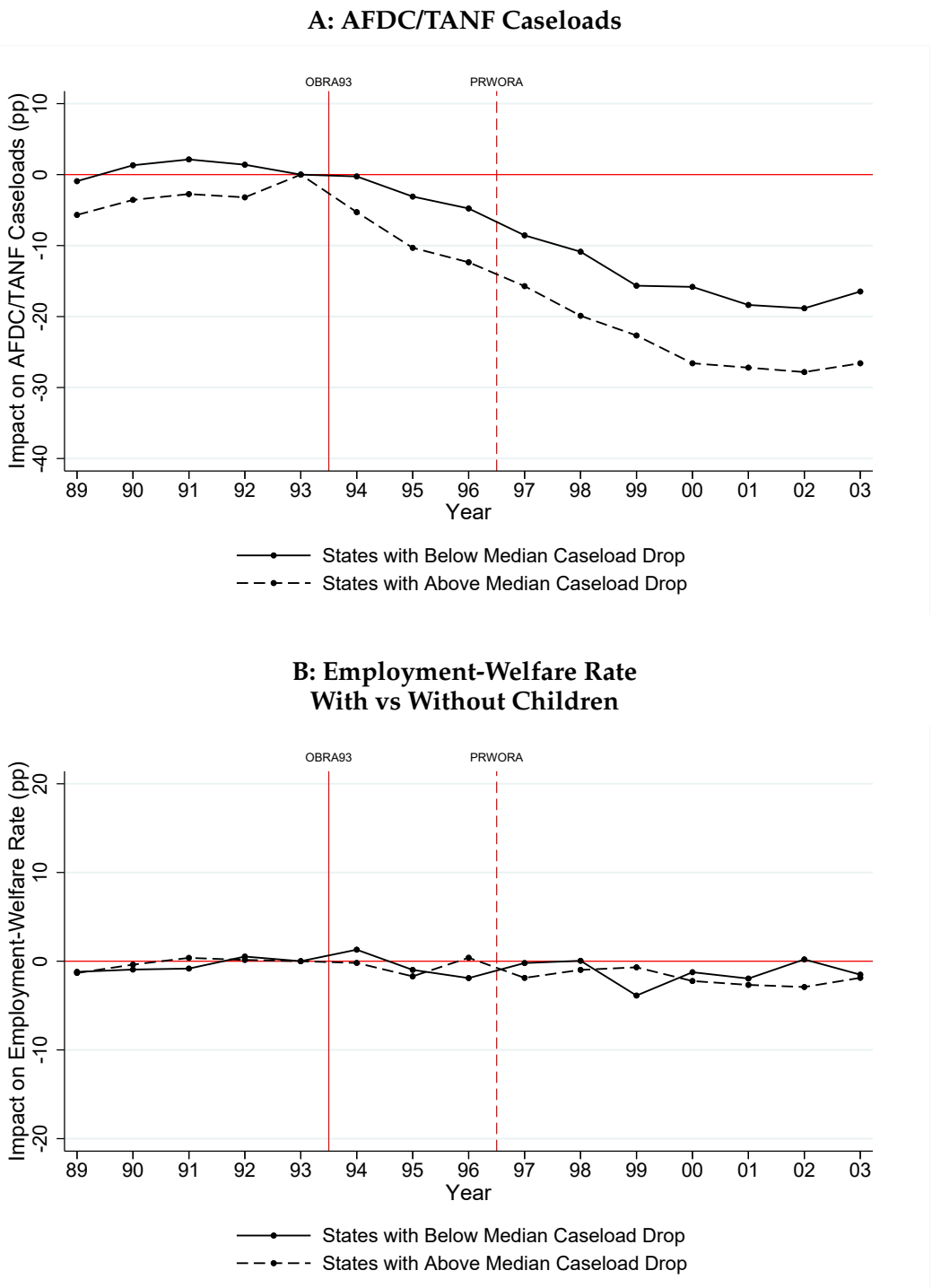



### F: 3+ Children, Youngest Aged 8-18




Notes: This figure shows DiD event studies of the 1993 reform by family size and age of youngest child for two different outcomes: the employment rate (solid line) and the employment-welfare rate (dashed line). The estimates are based on an extension of equation (1) that includes separate dummies for each number of children (1, 2, 3+), age of youngest child (0-7 and 8-18), and their interaction. The specification does not include demographic controls. The outcome variables (employment or employment/welfare) are measured at the annual level. The sample includes single women aged 20-50 using March CPS files.

## FIGURE A.XVIII: EMPLOYMENT VS AFDC/TANF CASELOADS, BY STATE

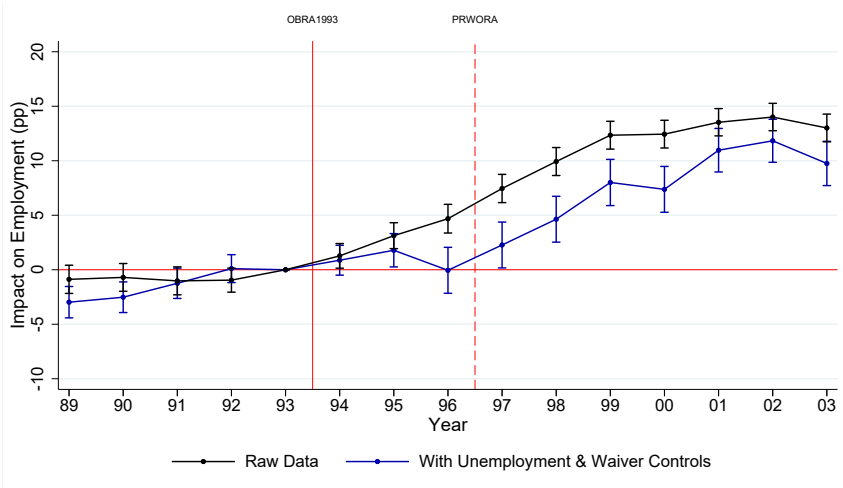



Notes: This figure shows DiD event studies of the 1993 reform, split by states with below and above median AFDC/TANF caseload drops between 1993-2000. Panel A plots the AFDC/TANF caseload series for the two groups of states, while Panel B plots the employment-welfare rate series. The estimates are based on an extension of equation (1) that interacts each variable with a dummy for being in a state with an above-median drop in AFDC/TANF caseload. The outcome variables are measured at the annual level. The sample includes single women aged 20-50 using March CPS files.

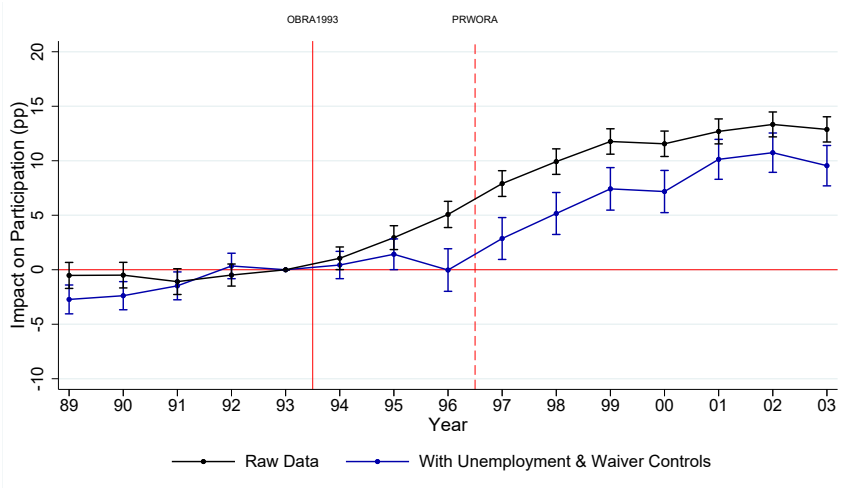
## FIGURE A.XIX: HOW MUCH CAN BE EXPLAINED BY THE BUSINESS CYCLE AND WAIVERS?

VARYING THE OUTCOME AND SAMPLE

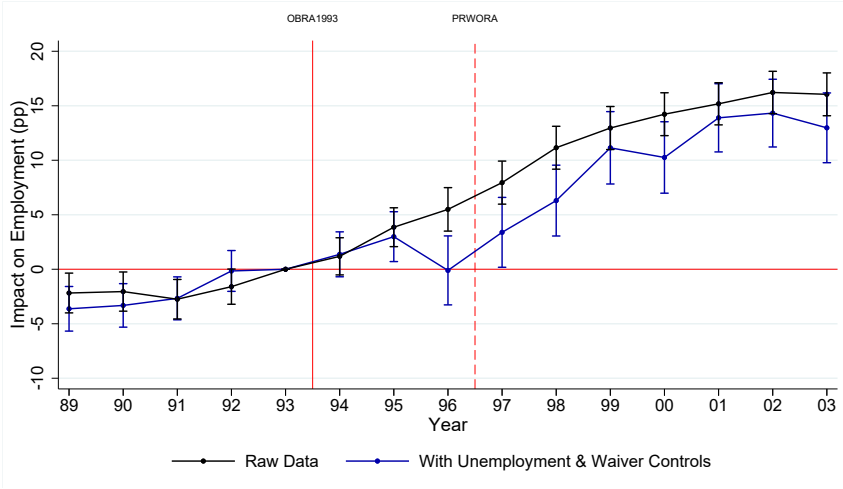
### A: Employment of All Single Mothers (Baseline)



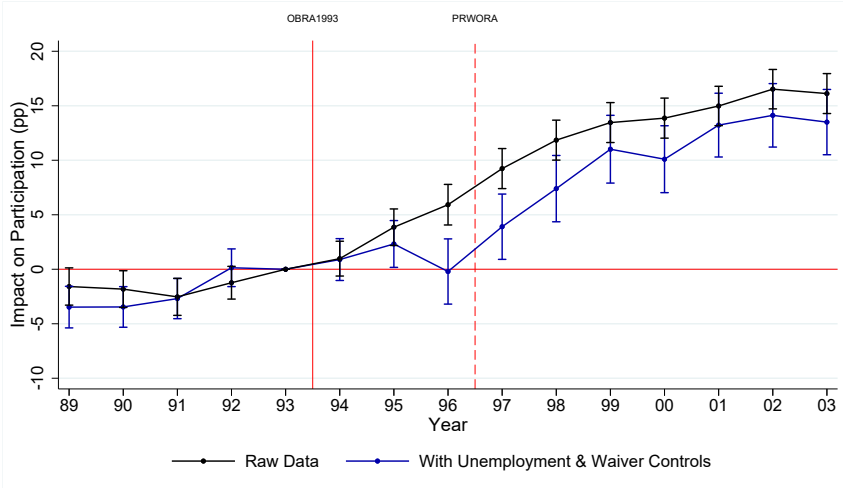

### B: Participation of All Single Mothers




### C: Employment of Low-Educated Single Mothers



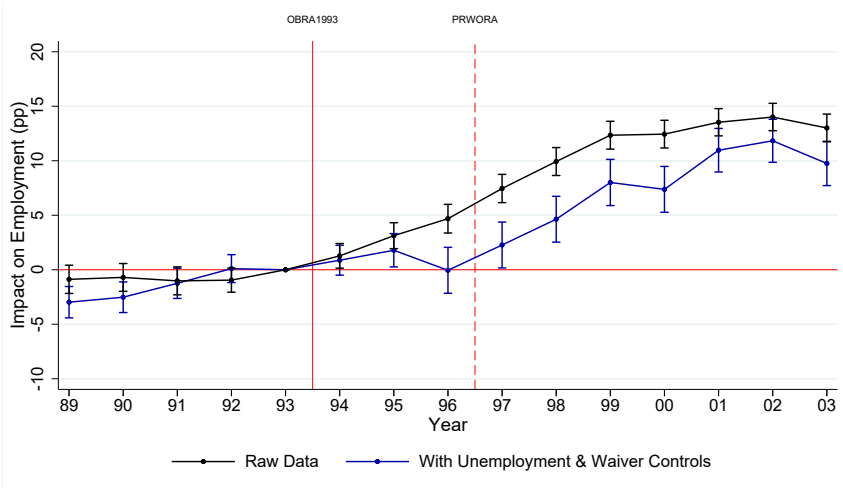

### D: Participation of Low-Educated Single Mothers



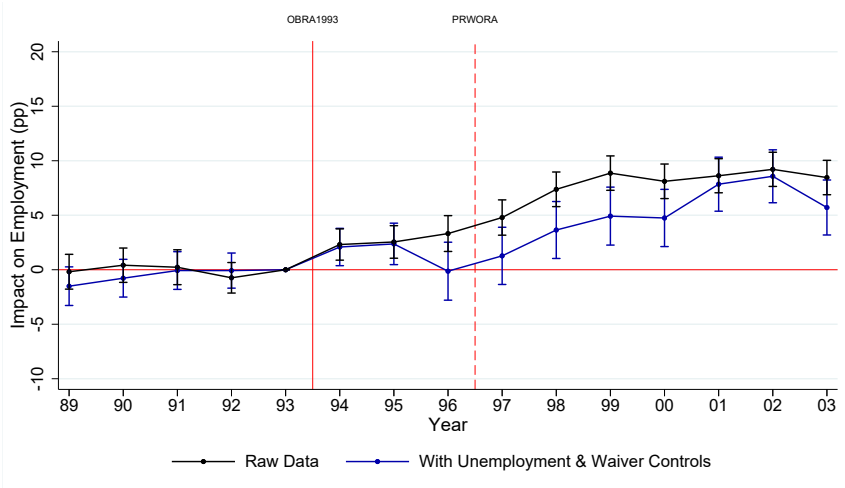

Notes: This figure shows DiD event studies for the 1993 reform with controls for unemployment and waivers using different samples and outcomes. The graphs plot DiD coefficients $\gamma_t$ based on equation (7). The top row shows results for all single mothers while the bottom row shows results for single mothers with a high school education or below. The left column shows results for weekly employment while the right panel shows results for weekly participation. In both panels, the black series show the raw DiD without controls. The sample includes single women aged 20-50 using the March and monthly CPS files combined. The 95% confidence intervals are based on robust standard errors clustered at the individual level.

## FIGURE A.XX: HOW MUCH CAN BE EXPLAINED BY THE BUSINESS CYCLE AND WAIVERS?
BY NUMBER OF CHILDREN

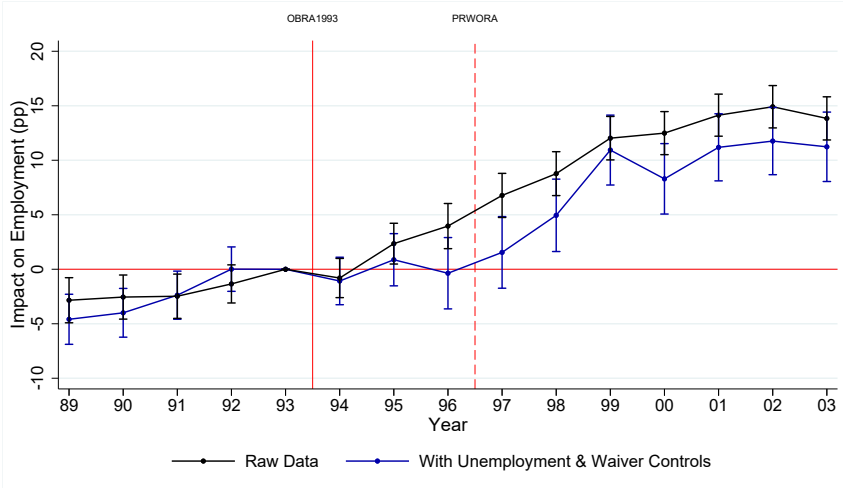
### A: With vs Without Children (Baseline)



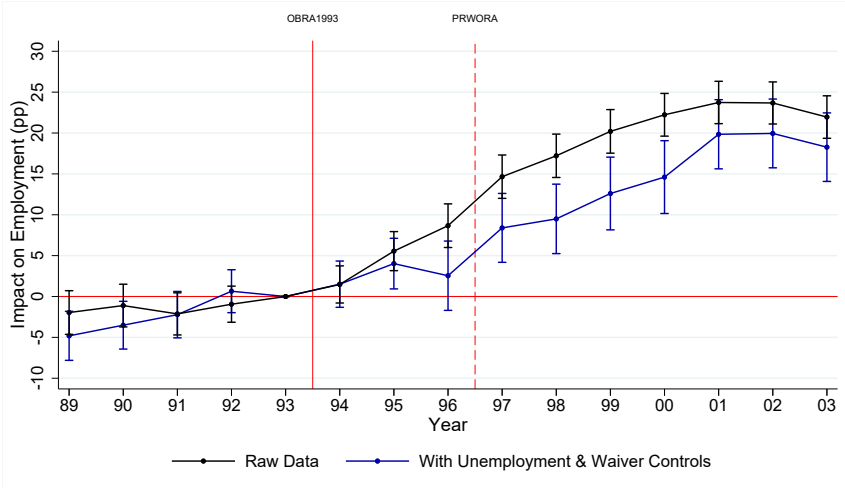

### B: With 1 vs 0 Children




### C: With 2 vs 0 Children




### D: With 3+ vs 0 Children

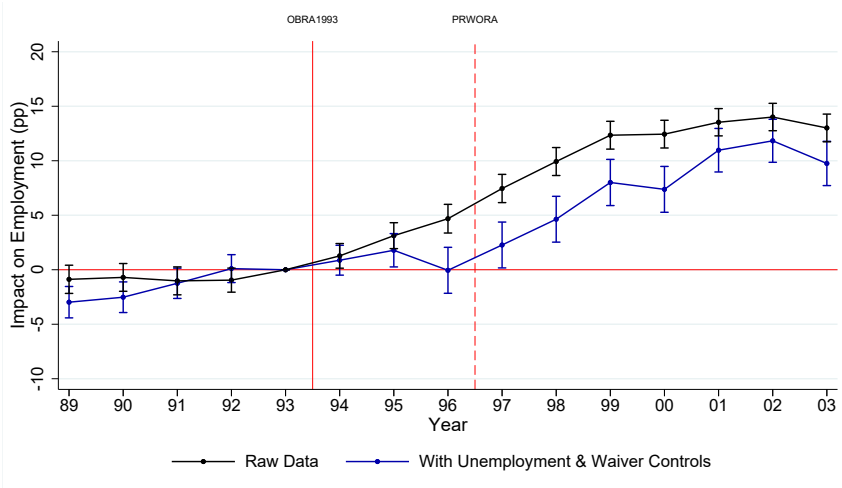



Notes: This figure shows DiD event studies for the 1993 reform with controls for unemployment and waivers by number of EITC-eligible children (any, 1, 2, and 3+). The graphs plot DiD coefficients $\gamma_t$ based on an extension of equation (7) that includes dummies for each family size. In both panels, the black series show the raw DiD without controls. The dependent variable is weekly employment. The sample includes single women aged 20-50 using the March and monthly CPS files combined. The 95% confidence intervals are based on robust standard errors clustered at the individual level.

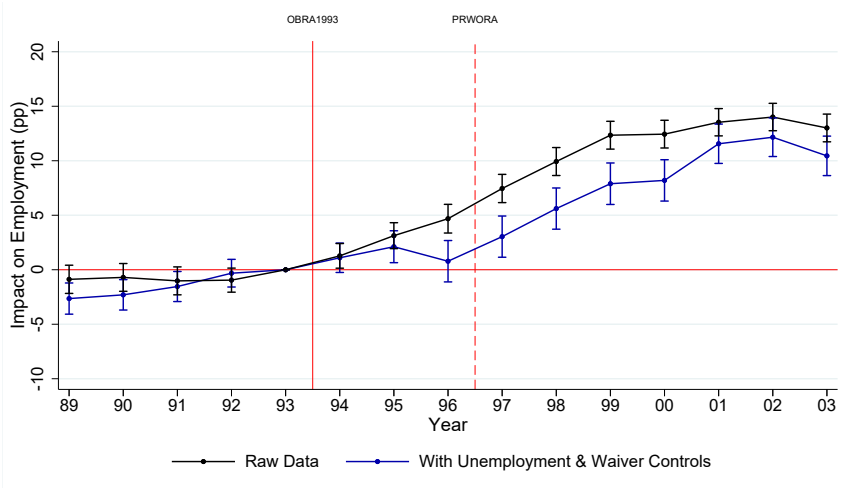
## FIGURE A.XXI: HOW MUCH CAN BE EXPLAINED BY THE BUSINESS CYCLE AND WAIVERS?

VARYING THE SPECIFICATION OF WAIVERS

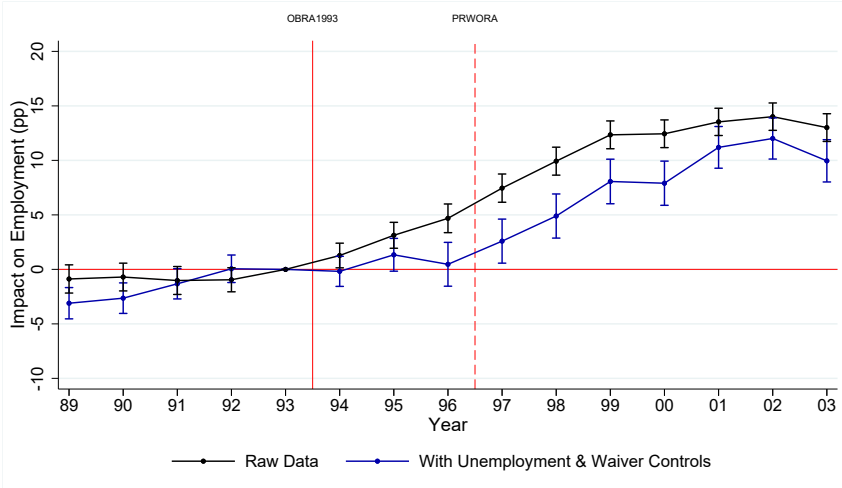
### A: Baseline Specification



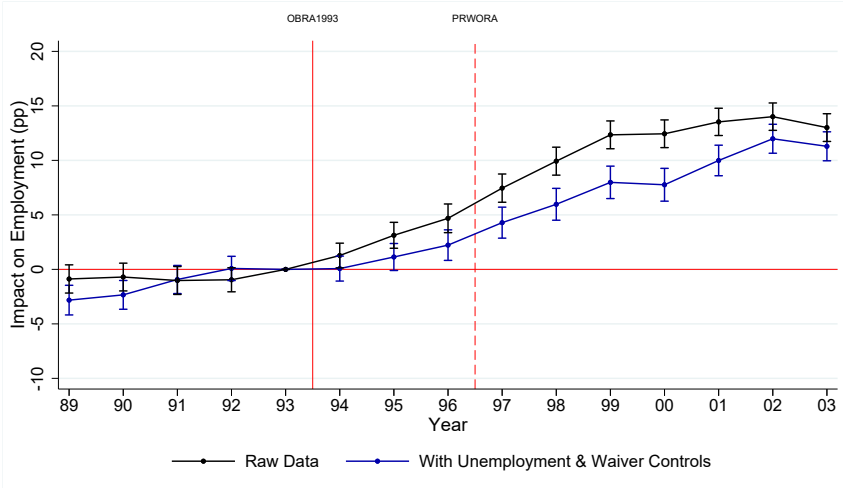

### B: Separate Indicators for the Six Waiver Types




### C: Using Date of Implementation




### D: Post-Waiver Indicator

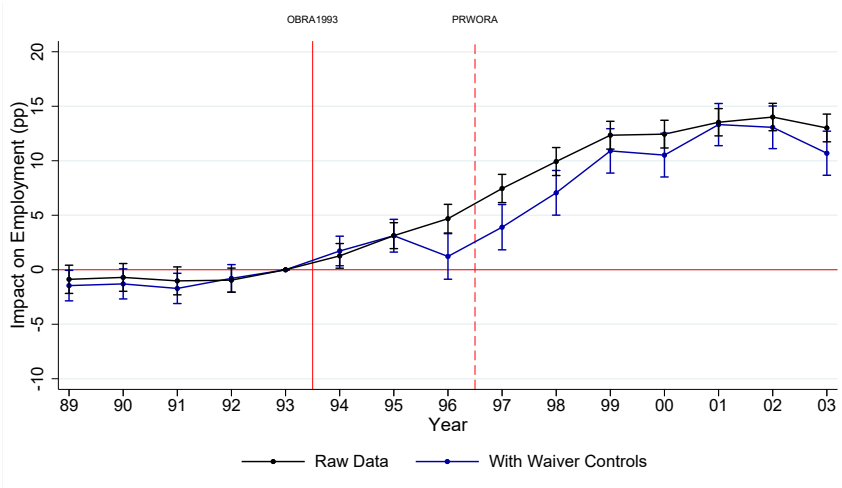



Notes: This figure shows DiD event studies for the 1993 reform with controls for unemployment and waivers. The graphs plot DiD coefficients $\gamma_t$ based on equation (7). The black series show the raw DiD without controls. In panel A, the blue series controls for unemployment by kids, state fixed effects, and waivers by kids (based on the waiver approval date). Panel B is based on an extension of equation (7) where the any waiver dummy is replaced by separate dummies for each of the six waiver types. Panel C is similar to panel A, but uses the date of waiver implementation rather than approval. Panel D uses a similar specification to panel A, but does not interact the any waiver dummy with yearly indicators. The dependent variable is weekly employment. The sample includes single women aged 20-50 using the March and monthly CPS files combined. The 95% confidence intervals are based on robust standard errors clustered at the individual level.

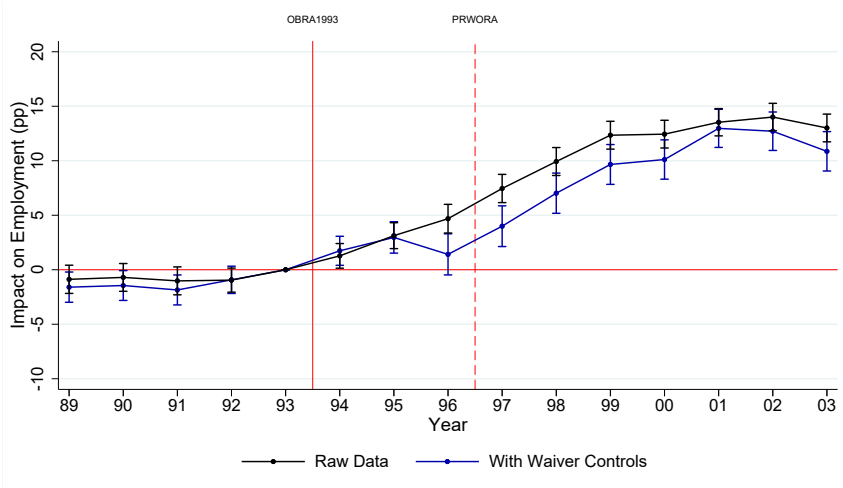
## FIGURE A.XXII: CONTROLLING ONLY FOR WELFARE WAIVERS

VARYING THE SPECIFICATION OF WAIVERS

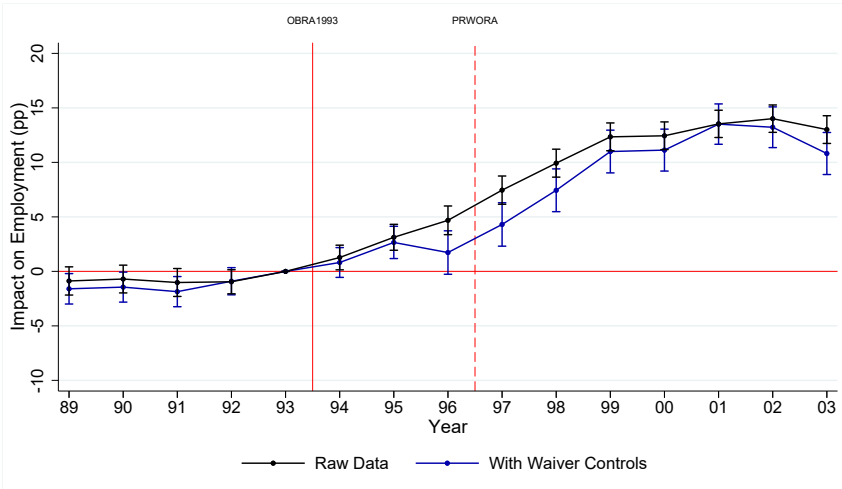
### A: Baseline Specification



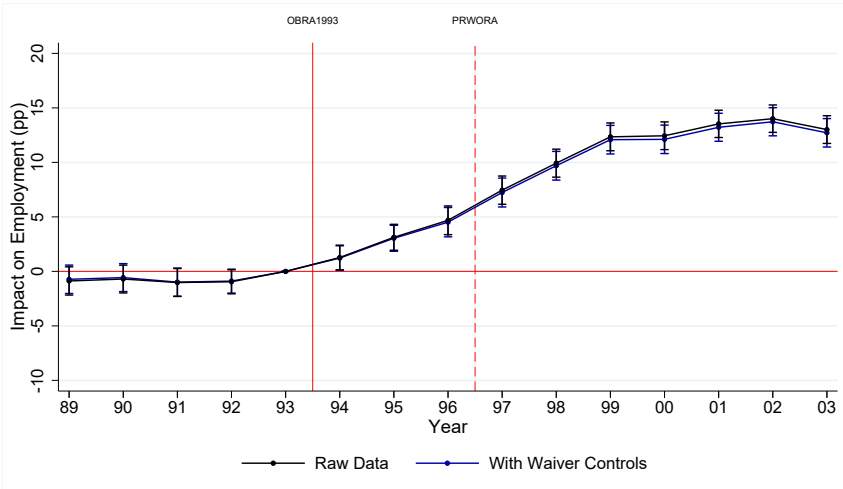

### B: Separate Indicators for the Six Waiver Types




### C: Using Date of Implementation




### D: Post-Waiver Indicator

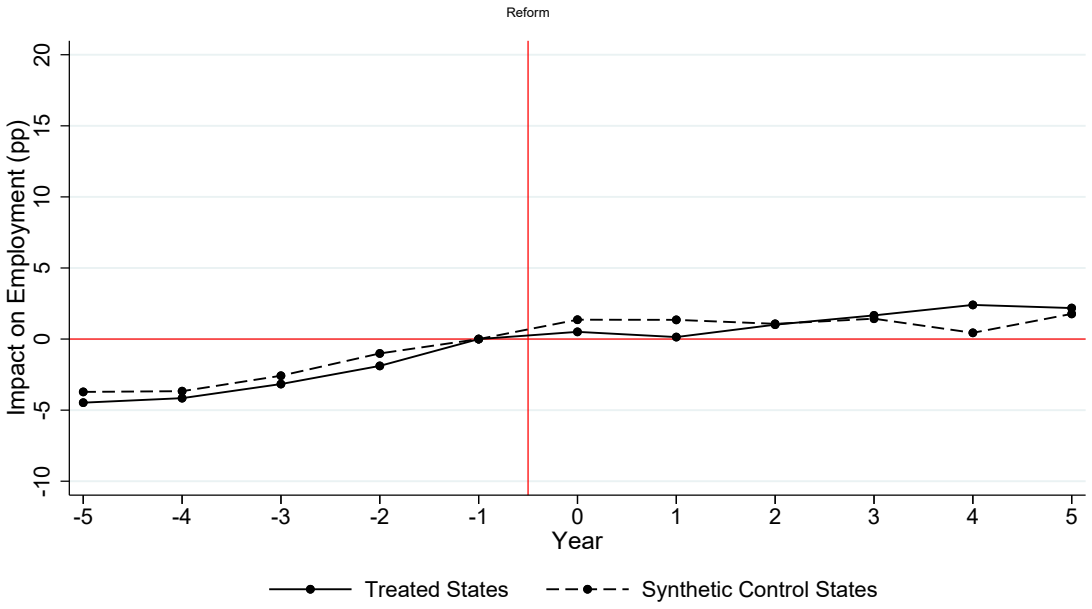



Notes: This figure shows DiD event studies for the 1993 reform with controls for unemployment and waivers. The graphs plot DiD coefficients $\gamma_t$ based on equation (7) without state unemployment controls. In all panels, the black series show the raw DiD without controls. In panel A, the blue series includes controls for state fixed effects and waivers by kids based on the date of waiver approval. Panel B is based on an extension of equation (7) where the any waiver dummy is replaced by separate dummies for each of the six waiver types. Panel C is similar to panel A, but uses the date of waiver implementation rather than approval. Panel D uses a similar specification to panel A, but does not interact the any waiver dummy with yearly indicators. The dependent variable is weekly employment. The sample includes single women aged 20-50 using the March and monthly CPS files combined. The 95% confidence intervals are based on robust standard errors clustered at the individual level.

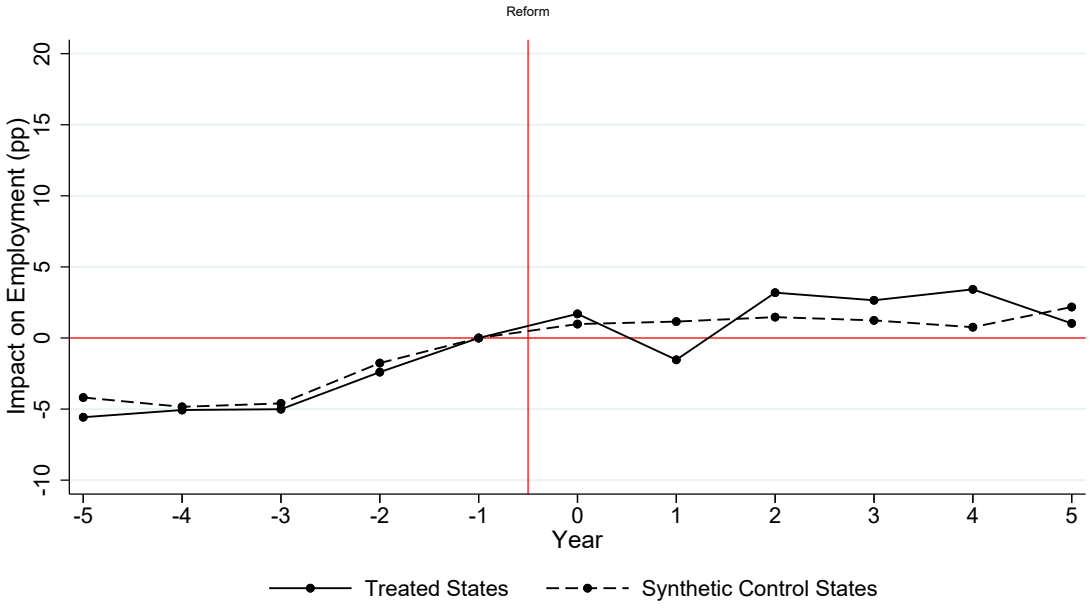
## FIGURE A.XXIII: A SYNTHETIC CONTROL ANALYSIS OF STATE EITC REFORMS

COMPARING SINGLE WOMEN WITH AND WITHOUT CHILDREN

### A: All State EITC Reforms




### B: Excluding Small State EITC Reforms

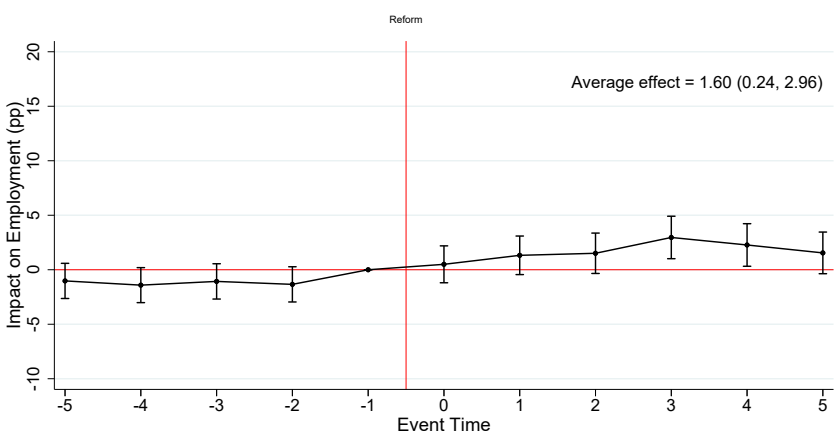



Notes: This figure shows stacked event studies of state EITC reforms using a synthetic control approach. The graphs plot employment rates for single women with children relative to single women without children in treatment and synthetic control states, respectively, normalized to zero in the pre-reform year. This is a triple-differences approach using variation across states and by the presence of children within states. Panel A includes all states that instituted an EITC supplement before 2015, while panel B includes only states that instituted a "large" EITC supplement. Large supplements are defined as refundable credits equal to at least 10% of the federal credit. In both panels, the synthetic control states are constructed from states that never instituted an EITC supplement. For each treatment state, a synthetic control state is constructed by matching on the employment rate in the five pre-reform years. Table A.VI shows the make-up of each synthetic state. For states with supplements enacted before 1993 the sample is based on March CPS files alone, while for states with supplements enacted after 1993 the sample is based on and March and monthly CPS files combined. The outcome is weekly employment and the sample includes all single women aged 20-50. See section D in the appendix for additional details.

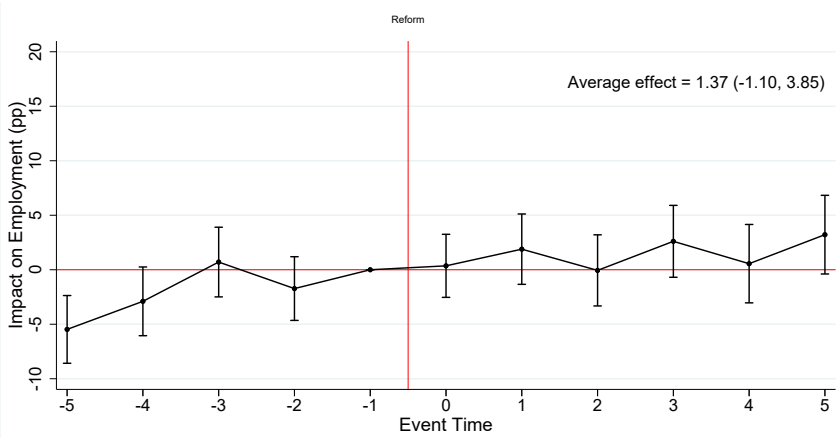
## FIGURE A.XXIV: STACKED EVENT STUDIES OF ALL STATE AND FEDERAL EITC REFORMS

EMPLOYMENT OF LOW-EDUCATED SINGLE WOMEN

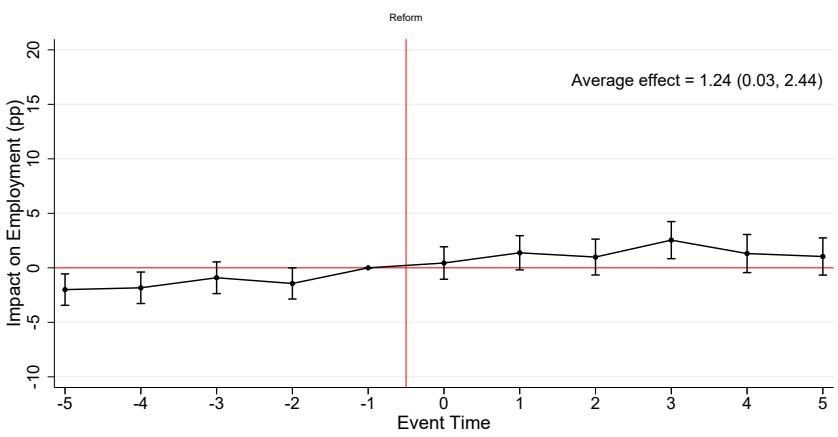
### A: Federal Reforms



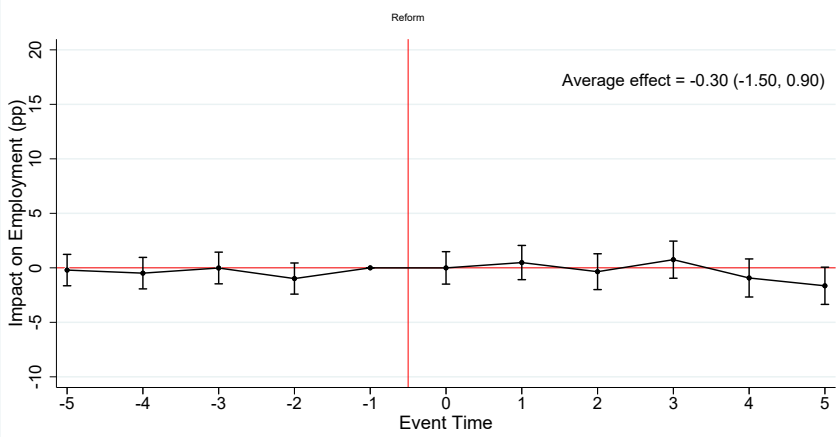

### B: State Reforms




### C: State and Federal Reforms




### D: State and Federal Reforms, Adjusted for Pre-Trends




Notes: This figure shows stacked event studies of all state and federal EITC reforms. The graphs plot DiD coefficients based on comparing single women with and without children across event time, normalized to zero in the pre-reform year (event time -1). The specifications control for demographics, and for the impact of waivers and unemployment around the 1993 federal reform (i.e., the controls in equation (7), interacted with an OBRA93 indicator). Panel A includes all federal reforms, Panel B includes all state reforms. while Panel C includes all state and federal reforms together. Panel D is similar to panel C, but adjusts for group-specific linear pre-trends. Each panel reports the average effect across the post-reform years, with 95% confidence intervals in parentheses. For reforms enacted before 1993 the sample is based on the March CPS files alone, while for reforms enacted after 1993 the sample is based on the March and monthly CPS files combined. The outcome variable is weekly employment, and the sample consists of single women aged 20-50 with a high school degree or less. See section E in the appendix for additional details.

# B Data Description

## B.1 Current Population Survey (CPS)

The CPS is made up of two main components: the Basic Monthly Survey and topical Supplements. In most cases, supplement samples are limited to individuals who participate in the Basic Monthly Survey. The Annual Social and Economic Supplement (ASEC) — the "March files" — is an exception. It includes an oversample of respondents from other months who are not scheduled to receive the March Basic Monthly CPS. The ASEC is the most commonly used supplement of the CPS due to its long history, large sample size, and detailed information on annual income and social assistance. I use the Basic Monthly and the ASEC CPS files, extracted from IPUMS at https://cps.ipums.org/cps/.

The Basic Monthly CPS uses a sample rotation scheme whereby households are included in the sample for four consecutive months, excluded for eight, and then return for another four months before leaving the sample permanently. Due to the 4-8-4 sampling pattern, individuals in the CPS show up a total of eight times over a 16 month period. Despite this panel element of the CPS, most researchers use the survey as a repeated cross-section. While it is impossible to link respondents between the Basic Monthly samples and the ASEC oversample, it is possible to link respondents across the monthly samples alone. IPUMS has greatly simplified this process by creating the variable CPSIDP. CPSIDP is a combination of the year a household enters the sample, the month a household enters the sample, a within-month household ID, and a within-month person ID. It allows users to uniquely identify and track respondents across all Basic Monthly samples. CPSIDP is not available for respondents in the ASEC oversample, however, and it is therefore not possible to link respondents from the ASEC oversample to their observations in the Basic Monthly Survey.[49] More detail about how the unique ID is constructed given these constraints is described in section B.1.4.

I use the Basic Monthly files from 1989-2018 and the ASEC files from 1968-2018.[50] Although the monthly files are available from 1976, they do not allow for accurate identification of the presence and number of children in a household prior to 1989. To identify children in the CPS, I rely on the IPUMS variable RELATE. For each observation in a household, this variable identifies the relationship to the household head. Prior to 1989, the only RELATE categories available in the

[49] See Flood & Pacas (2016) for a more comprehensive explanation for why the ASEC oversample respondents cannot be linked to their observations in the other months.

[50] I exclude the March Basic file, because all respondents in the March Basic sample are included in ASEC.

monthly files are "householder," "spouse," "other relative," and "other non-relative." The ASEC files, on the other hand, have more consistent categories for RELATE over time and, importantly, these categories include "child." The absence of the "child" category in the monthly files results in a substantial undercounting of children relative to the ASEC files. Hence, I use the Basic Monthly files (combined with ASEC files) from 1989 onwards, and the ASEC files on their own before this time.

### B.1.1 Extensive Margin Measures

I consider all four extensive margin measures available in the CPS: weekly employment, weekly participation, annual employment, and annual participation. Weekly measures are based on respondents' activities during the last week and are available in all Basic Monthly and ASEC files. Annual measures are based on respondent's activities during the last year and are only available in the ASEC.

**Weekly Measures:** Individuals' weekly employment and participation statuses are determined on the basis of answers to a series of questions relating to their activities during the preceding week. Upon answering these questions, respondents are grouped into eleven categories: "armed forces," "at work," "has a job, not at work last week," "unemployed, experienced worker," "unemployed, unexperienced worker," "housework," "unable to work," "school," "other," "unpaid, less than 15 hours," and "retired." Respondents classified as "at work" include those who either did any work for pay or profit or worked for at least fifteen hours without pay in a family business or farm. Respondents classified as "has a job, not at work last week" include those who did not work during the previous week but who acknowledged having a job or business from which they were temporarily absent (e.g. due to illness, vacation, or labor dispute). Individuals who do not fall into the above two categories but who reported either being temporarily laid off or actively searching for work are classified as unemployed.[51] Respondents who do not fall into any of the above categories are classified as not in labor force and distributed among the remaining six categories: "housework," "unable to work," "school," "other," "unpaid, less than 15 hours," and "retired."

**Annual Measures:** These are determined on the basis of questions in the ASEC pertaining to respondents' activities last year. The annual measures of employment and participation are based on different questions than the weekly measures. Annual employment is determined based on

[51] Respondents were considered to be actively searching for work if they were either looking for work as their major activity during the previous week (for 1962 through 1993) or answered yes to a question about whether they had been looking for work in the past four weeks (for 1994 onwards).

respondents' earnings last year. Respondents with positive earnings are classified as employed last year. Annual participation is based on the number of weeks a respondent was either working or searching last year. Respondents who either worked or were looking for work for one or more weeks last year are classified as having participated last year.

### B.1.2 Historical Changes to the CPS

In January 1994, the questions regarding labor force status (which underlie the weekly measures of employment and participation) underwent certain changes. A primary motivation for this redesign was to better classify individuals engaged in informal or intermittent activities. The redesign included a number of changes, all of which are explained in detail in Cohany *et al.* (1994). I focus here on the changes most pertinent to my analysis.

Prior to 1994, respondents were asked an "ice-breaker question" about their main activity during the preceding week. The question took the form "what were you doing most of last week? were you keeping house/working/in school or something else?" where the choice of prompt depended on the respondent's age and sex. The Bureau of Labor Statistics (BLS) concluded that this question led to an underreporting of women in part-time work. Additionally, respondents who indicated that they did not have a job were asked a follow-up question of the form "why were you absent from work last week?" Due to its open-ended nature, this question may have led to underreporting of respondents who were temporarily laid off. Beginning in 1994, these questions were redesigned to have more specific wording and fewer open-ended responses. For example, the initial "ice-breaker question" was replaced with a question asking if the respondent did any work for pay or profit last week. Similarly, respondents who indicated they did not have a job were asked whether they were laid off and if the layoff was temporary.

To asses the impact of this redesign on estimates of labor force participation, the BLS ran a parallel survey from July 1992 through December 1993 that interviewed households using the new survey questions. Cohany *et al.* (1994) examine the differences between official CPS and parallel survey estimates in a variety of metrics. They find that for women aged 20 and above, the weekly employment rate was 55.1% in the official CPS and 55.8% in the parallel survey, a difference of only 0.7 percentage points. The weekly participation rate was 58.5% in the official CPS and 59.6% in the parallel survey, a difference of 1.1 percentage points. When including controls for state of residence, race, and hispanic origin, these differences drop to 0 and 0.1 percentage points, respectively. These differences are too small to have any substantial effect on the analysis. In any case,

the difference-in-differences design reduces this issue even further, or eliminates it entirely, by including year fixed effects.

### B.1.3 Nonresponse in the CPS

The CPS is subject to two types of nonresponse: noninterview households and item nonresponse. Noninterview occurs when a household refuses to participate in the survey altogether and is especially common in March, corresponding to the delivery of the ASEC. In the Basic Monthly CPS, noninterview is accounted for by distributing the weights of noninterview households among interviewed households. In the ASEC, noninterview is accounted for by imputing missing values.

The second source of data loss, item nonresponse, occurs when respondents refuse to answer specific questions within the survey. To compensate for item nonresponse (and for noninterview in the ASEC), the BLS imputes missing values using one of three methods. First, if possible, missing values are inferred from other characteristics of a respondent or other respondents within the same household. For example, if a respondent has a missing value for race, it is assigned based the race of other household members. These edits, known as relational edits, are most commonly used for demographic variables. Next, if relational edits are not possible, longitudinal edits are made. Longitundial edits exploit the panel nature of CPS data and use respondent's entries from previous months to fill in missing values. Labor force items are typically imputed using longitudinal edits. Finally, if neither of the above are possible, the CPS uses a "hot-deck" imputation method. The "hot-deck" method assigns a missing value from a record with similar characteristics, called the hot deck. Hot decks are made up of demographic characteristics such as age, race, sex, occupation and educational attainment. The specific characteristics that make up a hot deck vary depending on which variable is being imputed.

How common is nonresponse in the CPS? Historically, nonresponse in the CPS was very modest, but it has grown significantly over time (see e.g., Meyer *et al.* 2015; Bollinger *et al.* 2017; Jones & Ziliak 2019). Household non-interview rates have risen from 7-9 percent in 2004 to 13-15 percent in 2017.[52]

As for item nonresponse, two points are worth mentioning. First, item nonresponse is much smaller for demographic and labor force variables than it is for earnings. In 2018, only 0.45% of the respondents in the estimation sample have imputed labor force status and 3.1% have imputed

[52]These statistics have been retrieved from https://www.census.gov/prod/2006pubs/tp-66.pdf and https://www.census.gov/programs-surveys/cps/technical-documentation/methodology/non-response-rates.html.

demographics (marital status, age, or race), compared to 17.9% with imputed earnings. Second, the degree of item nonresponse in earnings has increased over time. While 17.9% of respondents have imputed earnings in 2018, this number was only 10.9% in 1970.[53] The significant degree of nonresponse and imputation in the earnings variable is another argument for using the weekly measures of extensive margin labor supply, as I do here.

### B.1.4 Sample and Variables

I restrict the sample to single women (never married, separated, divorced, or widowed) aged 20-50.[54] I drop observations with a zero, negative, or missing weight ($wgt$), missing state FIPS code ($stfips$), or missing educational attainment ($educ$). The difference-in-differences analyses are based on comparing single women with EITC eligible children (treatment group) to single women without recorded children (control group). The control group includes both those who never had any children and those whose children do not live at home. A small fraction of single women with EITC *ineligible* children living at home are dropped from the sample.[55] These restrictions leave me with a sample of 4,858,644 individual-month observations across survey years 1968-2018.

Unless otherwise specified, variables in the ASEC and monthly files are defined in the same way. Variables based on income and welfare participation are only available in the ASEC.

- Unique household ID ($hid$): This variable is my best attempt at a unique identifier for each household in the CPS. In the monthly files, households can be uniquely identified and tracked across subsequent months using IPUMS variable CPSID. In the ASEC files, the variable CPSID is unavailable so I instead identify households using a combination of IPUMS variables YEAR and SERIAL. As a result, respondents in the ASEC cannot be linked to those in the monthly files and the variable $hhid$ only uniquely identifies households in the monthly and ASEC files separately.

- Unique person ID ($id$): This variable is a unique combination of $hhid$ and IPUMS variable PERNUM, which uniquely identifies individuals within a household.

[53] The growth in item nonresponse rates has also been quite large for other income variables, including income from social assistance programs. See Meyer *et al.* (2015) and Meyer & Mittag (2019) for an investigation of item nonresponse bias in questions pertaining to social assistance receipt.

[54] Except for one analysis in the online appendix in which I consider a sample of married women.

[55] For example, this includes women with children who recently turned 19 and are not full-time students. The reason for dropping these observations (as opposed to assigning them to the control group) is that most of them would have been EITC eligible in the recent past and are therefore borderline cases between the treatment and control groups. In any case, assigning them to the control group does not make much of a difference to any of the results.

- Number of eligible children ($nechild$): This variable identifies the number of EITC eligible children a respondent has. An ETIC eligible child is defined as a household member who is either under 19 or who is under 24 and a full time student (EMPSTAT = 33). Using a combination of household ID ($hhid$) and IPUMS variables MOMLOC and POPLOC, I link respondents to their biological and adoptive children. I then look to the age and education associated with each child's observation to establish whether the child is EITC eligible. For more detail on how to link respondents to their children, see https://cps.ipums.org/cps-action/variables/MOMLOC#description_section.

- Age of youngest child ($ageyc$): The minimum age of all EITC eligible children. Takes on a value of 99 if respondent has no children.

- Single ($single$): Takes on a value of one if the respondent is separated (MARST = 3), divorced (MARST = 4), widowed (MARST = 5), or never married (MARST = 6), a value of zero if the respondent is married with spouse present (MARST = 1) or married with spouse absent (MARST = 2), and is missing otherwise.

- Age ($age$): this variable is taken from the IPUMS $age$ variable and is top-coded at 90.

- Gender ($female$): takes on a value of one if IPUMS variable SEX = 2 and zero otherwise.

- Education Level ($edlevel$): takes on a value of one if the respondent has less than a HS education (IPUMS variable EDUC = 2-72), a value of two if the respondent has a HS diploma or equivalent (EDUC = 73), and a value of three if the respondent has more than a HS education (EDUC = 80-125).

- Low-educated ($lowed$): takes on a value of one if respondent has less than a HS education ($edlevel = 1 - 2$) and zero otherwise.

- Alternate low-educated ($lowedA$): takes on a value of one if respondent has less than a HS education ($edlevel = 1 - 2$) and zero if the respondent has a a college degree or above ($EDUC = 91 - 125$).

- AFDC receipt ($afdc\_annual$): takes on a value of one if respondent receives AFDC/TANF (SRCWELFR = 1) or both AFDC/TANF and another type of welfare (SRCWELFR = 3), takes on a value of zero if respondent doesn't receive welfare (SRCWELFR = 0) or receives only another type of welfare (SRCWELFR = 2), and is missing otherwise.

- Weekly employment ($emp$): takes on a value of one if respondent is in the armed forces (EMPSTAT = 1), working (EMPSTAT = 10), or has a job but is not at work (EMPSTAT = 12), a value of zero if respondent is unemployed (EMPSTAT = 20-22), or not in the labor force (EMPSTAT = 30-36), and is missing otherwise.

- Weekly participation ($lfp$): takes on a value of one if the respondent is in the armed forces (EMPSTAT = 1), working (EMPSTAT = 10), has a job but is not at work (EMPSTAT = 12), or is unemployed (EMPSTAT = 20-22), a value of zero if the respondent is not in the labor force (EMPSTAT = 30-36), and is missing otherwise.

- Annual employment ($emp\_annual$): takes on a value of one if person had positive earnings last year (IPUMS variable INCWAGE > 0), zero if they had zero earnings last year.[56]

- Annual participation ($lfp\_annual$): takes on a value of one if the respondent worked (WKSWORK1) or looked for work (NWLOOKWK) for at least one week last year and takes on a value of zero if the respondent didn't look for work at all last year (WKSWORK1 = 0 and NWLOOKWK = 0), and is missing otherwise.

- Income ($wsal$): the $wsal$ variable comes from the IPUMS variable INCWAGE. Values of 9999999 and 9999998 are recoded to be missing.

- Person weight ($wgt$): in the ASEC this variable is equal to the IPUMS variable ASECWT; in the monthly files this variable is equal to the IPUMS variable WTFINL.

- State unemployment rate ($st\_unemployed$): the state unemployment rate is calculated by dividing the number of unemployed respondents (EMPSTAT = 20-22) by the number of respondents in the armed forces (EMPSTAT = 1), working (EMPSTAT = 10), or with a job but not at work (EMPSTAT = 12) in a given state.

## B.2 Supplementary Data

Data on state welfare waivers comes from the Department of Health and Human Services (HHS).[57] I follow HHS and consider only major statewide waivers in the following six categories: termination time limits, work requirement time limits, JOBS exemptions, JOBS sanctions, family caps, and

[56] When using the annual employment variables ($lfply$ and $emply$) as outcomes, I substitute $year$ for $year - 1$ to reflect the fact that the employment measure refers to the previous year.

[57] Health and Human Services, Assistant Secretary for Planning and Evaluation, Setting the Baseline: A Report on State Welfare Waivers. Retrieved from https://aspe.hhs.gov/report/setting-baseline-report-state-welfare-waivers.

earnings disregards. I use either the dates of approval or the dates of implementation to create a state-by-year dataset that contains indicators for each waiver type that are equal to 1 in all years post-approval (or post-implementation) and 0 otherwise. I define the first post-approval year to be the year of approval, no matter the time of year the waiver was approved. The any-waiver indicator is equal to one if any statewide waiver was in effect in that year.

Data on federal EITC parameters come from the Tax Policy Center.[58] Data on state EITC parameters come from the Tax Policy Center,[59] the National Bureau of Economic Research (NBER),[60] and various state-specific sources.

[58] Tax Policy Center. "Earned Income Tax Credit Parameters, 1975-2018." Retrieved from https://www.taxpolicycenter.org/statistics/eitc-parameters.

[59] Tax Policy Center. "State EITC as Percentage of the Federal EITC" Retrieved from https://www.taxpolicycenter.org/statistics/state-eitc-percentage-federal-eitc.

[60] NBER. "State EITC provisions 1977-2016." Retrieved from https://users.nber.org/∼taxsim/state-eitc.html.

# C Elasticity Calculations

The extensive margin elasticity with respect to the net-of-tax rate on labor force participation is defined in equation (2).

The numerator of the elasticity ($\Delta P/P$) is calculated as the difference-in-differences between single women with and without children (or between different numbers of children) after 10 years. Specifically, $\Delta P$ corresponds to the coefficient estimate $\hat{\gamma}_{2003}$ in equation (1), while $P$ is the baseline employment or participation rate in 1993. The values of $\Delta P$ and $P$ for each family size are shown in Table 3.

The denominator of the elasticity ($\Delta\left(1-\tau\right)/\tau$) is calculated based on a pre-reform sample of single women (years 1991-1993), predicted earnings from the specification in (3), and a tax-benefit simulation model. The tax parameters $\tau$ and $\Delta\tau$ are calculated at the individual level, but the denominator of $\varepsilon$ is based on the population averages. The following subsections describe the details of the calculation of $\tau$ and $\Delta\tau$.

## C.1 Baseline Net-of-Tax Rate

Calculating the baseline net-of-tax rate $1-\tau$ in the full sample requires a measure of earnings conditional on working for both workers and non-workers. I use actual observed earnings for workers and predicted earnings from (3) for non-workers. Based on these earnings measures, I simulate tax liabilities from state income taxes, federal income taxes, and payroll taxes using NBER's tax simulation model (TAXSIM). TAXSIM requires information on income, dependents, and demographics.[61] The following list describes the mapping between TAXSIM variables (shown in parentheses) and CPS variables:

- Marital status ($mstat$) is set as "single or head of household" (corresponding to a value of one) for all observations.
- Age ($page$) is equal to the variable $age$ described in appendix section B.1.4.
- Number of dependents ($depx$) uses IPUMS variable NCHILD, which corresponds to the number of own children at home.
- Number of children under 13 with eligible child care expenses ($dep13$) is equal to number of children at home that are under 13. Uses variables NCHILD (described above) and $ageyec$

[61] The full list of TAXSIM inputs is listed online at https://users.nber.org/~taxsim/taxsim27/

(described in appendix section B.1.4).

- Number of children under 17 for the entire tax year ($dep17$) is equal to number of children at home that are under 17. Uses variables NCHILD (described above) and $ageyec$ (described in appendix section B.1.4).

- Number of qualifying children for EITC ($dep18$) is equal to variable $nechild$ (described in appendix section B.1.4).

- Earnings from wages and salary ($pwages$) is equal to observed earnings for workers (variable $inc$, described in appendix section B.1.4) and predicted earnings for non-workers (estimated from the earnings regression in eq. 3). The earnings regression includes dummies for the age of the woman (20-24, 25-29, 30-34, 35-39, 40-44, 45-50), number of EITC eligible children (0, 1, 2, 3, 4, 5, 6+), age of youngest child (0-1, 2-3, 4-6, 7-9, 10-13, 14-17, 18+), education level (below high school, high school degree, some college, college degree), race (white, non-white), state of residence, and two-way interactions between education, age, number of children, and age of youngest child. The specification is weighted by CPS weights and run on the sample of single women with positive earnings in the pre-reform years, 1991-1993 (all adjusted to 1993 USD). Using the parameters from this regression, earnings are predicted for non-workers. Those with predicted earnings below zero are dropped (only 7 observations).

- Dividends ($dividends$) comes from IPUMS variable INCDIVID. INCDIVID indicates how much pre-tax income the respondent received from stocks and mutual funds.

- Interest received ($intrec$) comes from IPUMS variable INCINT. INCINT indicates how much pre-tax income the respondent received from interest on saving accounts, certificates of deposit, money market funds, bonds, treasury notes, IRAs, and/or other investments which paid interest.

- Other property income ($otherprop$) comes from IPUMS variable INCRENT. INCRENT indicates how much pre-tax income the respondent received from rent (after expenses), from charges to roomers or boarders, and from money paid by estates, trusts, and royalties.

- Gross Social Security benefits ($gssi$) comes from IPUMS variable INCSS. INCSS indicates how much pre-tax income the respondent received from Social Security payments.

- Unemployment insurance ($ui$) comes from IPUMS variable INCUNEMP. INCUNEMP indicates how much pre-tax income the respondent received from state or federal unemployment compensation, Supplemental Unemployment Benefits (SUB), or union unemployment or strike benefits.

- Age and wage of spouse ($sage$, $swages$) are set to zero as the sample only includes single women.

- Other income ($stcg$, $ltcg$, $mortgage$, $nonprop$, $pensions$, $rentpaid$, $proptax$, $otheritem$, $childcare$) are set to zero as they are not observed in the CPS.

For each individual, tax liability is simulated when working and when not working. Hence, TAXSIM is run twice, once where earnings from wages and salary is set equal to actual/predicted earnings (as described above) and once where earnings is set equal to zero. Based on the simulations of state income tax, federal income tax, and payroll tax liabilities, the average tax rate $ATR$ can be calculated as follows

$$ATR = \frac{(fed_1 - fed_0) + (st_1 - st_0) + FICA}{pwages}$$

where $fed_1$ and $fed_0$ ($st_1$ and $st_0$) are the federal (state) income tax liabilities when working and not working, respectively, and $FICA$ is the payroll tax liability (Federal Insurance Contributions Act tax) when working.

In addition to taxes, the participation tax rate also accounts for welfare benefits that are lost when entering the labor market. I calculate benefits from AFDC and Food Stamps when not working ($B_0$) and when working ($B_1$) as follows

$$\begin{aligned} B_0 &= maxAFDC + maxFS \\ B_1 &= (maxAFDC - 0.7 \cdot pwages) \cdot \mathbf{I}_{AFDC} + (maxFS - 0.2 \cdot pwages) \cdot \mathbf{I}_{FS} \end{aligned}$$

where $maxAFDC$ and $maxFS$ denote the maximum available AFDC and Food Stamp benefits (in 1993), which vary by family size and by state. For those who are working, benefits are reduced at a rate of 0.7 for AFDC and 0.2 for Food Stamps for each dollar earned until benefits are exhausted. The indicators $\mathbf{I}_{AFDC}$ and $\mathbf{I}_{FS}$ are equal to one when calculated AFDC and Food Stamp benefits after claw-back are still non-negative and equal to zero otherwise.

Finally, the participation tax rate can be calculated as follows

$$\tau = ATR + takeup\_rate \cdot \frac{B_0 - B_1}{pwages}$$

where $takeup\_rate$ scales welfare benefits to account for incomplete take-up of welfare benefits. Following Eissa *et al.* (2008), the average take-up rate is set equal to 54%. The participation tax rate is top-coded at 0.99.

### C.2 Change in Tax Rate

To calculate the average change in the participation tax rate, $\Delta(1-\tau)$, I focus exclusively on the changes implied by the EITC expansion. For each individual, I calculate a pre-reform EITC subsidy (1993 rules) and a post-reform EITC subsidy (1996 rules) using baseline earnings in 1993.[62] The EITC is a function of earnings ($pwages$), family size $n$, and year $t$. It is calculated as follows

$$EITC = \begin{cases} pwages \cdot phase\_in_{nt} & \text{if } pwages < k1_{nt} \\ maxcredit_{nt} & \text{if } k1_{nt} \leq pwages \leq k2_{nt} \\ maxcredit_{nt} - phase\_out_{nt} \cdot (pwages - k2_{nt}) & \text{if } k2_{nt} \leq pwages \leq exhaust_{nt} \\ 0 & \text{if } pwages > exhaust_{nt} \end{cases}$$

where $phase\_in$ and $phase\_out$ denote the EITC phase-in and phase-out rates, $maxcredit$ is the maximum possible EITC refund, $k1$ and $k2$ are the first and second kink points of the EITC, while $exhaust$ is the point of EITC exhaustion. The change in the net-of-tax rate equals the difference between the pre- and post-reform EITC credits (1993 vs 1996, under baseline earnings $pwages$), $EITC_{96} - EITC_{93}$, divided by baseline earnings $pwages$. Labeling this difference $\Delta(1-\tau_n)$ for family size $n$, the tax rate change that enters into the elasticity formula (2) equals the difference-in-differences $\Delta(1-\tau) = \Delta(1-\tau_n) - \Delta(1-\tau_0)$. This calculation assumes 100% take-up of the EITC conditional on eligibility. Given incomplete take-up, the net-of-tax rate change $\Delta(1-\tau)$ will be upward biased and the elasticity $\varepsilon$ is therefore conservative.

[62] The calculation of the post-reform EITC under baseline earnings uses 1993 earnings measured in 1996 USD.

# D Synthetic Control Approach

This analysis is implemented by creating a synthetic control state for each state with an EITC supplement, and then running a stacked event study comparing treatment and synthetic control states around state EITC introductions. Table A.II lists all states with an EITC supplement and provides key details about those supplements.

## D.1 Constructing synthetic controls

To run the synthetic control analysis, CPS data is collapsed into state-by-year observations. The data is collapsed separately for single women with and without children. I consider an event study window from five years before to five years after each reform. Since the monthly files can only be used from 1989 onwards, to ensure that each reform has a consistent dataset across the event window, the analysis uses the March CPS files alone for reforms that occurred before 1993 and the March and monthly CPS files combined for reforms that occurred from 1993 onwards. Event time is set to zero in the first year after the introduction of the EITC supplement.

I focus on the 27 states that implemented and maintained an EITC supplement for at least 3 years.[63] For each of these treatment states, a synthetic control state is constructed from states that never had a supplement, matching on the level of the employment rate in each of the five pre-reform years. Table A.VI shows the makeup of each synthetic state. Synthetic control regressions are run using the stata command `synth`.[64]

In the main specification, synthetic control regressions are run on the sample of single women with children. Hence, the empirical strategy is a difference-in-differences comparing different states over time, conditioning on children. As a robustness check, I consider a triple-differences specification that also exploits the variation between those with and without children within states.

## D.2 Stacked Event Study

Having obtained measures of employment in treatment and synthetic control states, a stacked event study specification is used to estimate the average effect across all state EITC reforms. The event study is based on the following specification

[63] A total of 30 states have instituted a supplement (see Table A.II). But the state of Washington never funded and paid out the credit, while Hawaii and South Carolina instituted their supplements only in 2018.

[64] See http://fmwww.bc.edu/RePEc/bocode/s/synth.html for documentation on the `synth` command.

$$P_{st} = \sum_j \alpha_j \cdot Event_{j=t} + \beta \cdot Treat_s + \sum_{j \neq -1} \gamma_j \cdot Event_{j=t} \cdot Treat_s + \nu_{st}, \quad (8)$$

where $P_{st}$ is the employment rate in state $s$ at time $t$, $Event_{j=t}$ is an indicator for event time $t$, and $Treat_s$ is an indicator for treatment states. In Figure 12, the treatment series (solid line) corresponds to the coefficient $\hat{\alpha}_t + \hat{\gamma}_t$, while the synthetic control series (dashed line) corresponds to $\hat{\alpha}_t$. Two different samples of treatment states are considered. In panel A of Figure 12, the treatment sample includes all 27 states that implemented and maintained a supplement for at least three years. In panel B, the treatment sample includes only the 13 states with "large EITC reforms", defined as the introduction of *refundable* supplements that reached at least 10% of the federal EITC within three years of enactment.[65]

Figure A.XXIII is based on a similar analysis, but it adds the variation from children (within states) to the variation across states in a triple-differences design. Specifically, the analysis is based on the following specification

$$\begin{aligned} P_{kst} = & \sum_j \alpha_j \cdot Event_{j=t} + \beta \cdot Kids_k + \gamma \cdot Treat_s + \delta \cdot Kids_k \cdot Treat_s \\ & + \sum_{j \neq -1} \zeta_j \cdot Event_{j=t} \cdot Kids_k + \sum_{j \neq -1} \eta_j \cdot Event_{j=t} \cdot Treat_s \\ & + \sum_{j \neq -1} \theta_j \cdot Event_{j=t} \cdot Kids_k \cdot Treat_s + \nu_{kst} \end{aligned} \quad (9)$$

where $P_{kst}$ is the employment rate for those with kids status $k$ (with or without) in state $s$ at time $t$. Here, the treated series (solid line) corresponds to the coefficient $\hat{\zeta}_t + \hat{\theta}_t$, while the synthetic control series (dashed line) corresponds to $\hat{\zeta}_t$.

[65] The 13 states with large EITC reforms are California (2015), Colorado (1999), Connecticut (2011), Dist. of Columbia (2000), Kansas (1998), Massachusetts (1997), Michigan (2008), Minnesota (1991), New Jersey (2000), New Mexico (2007), New York (1994), Vermont (1988), and Wisconsin (1989).

# E Stacked Event Study of All Federal and State Reforms

The purpose of the stacked event study analysis is to capture the average effect across all 31 EITC reforms at the state and federal level.[66] The analysis is implemented by converting calendar time around each reform into event time (with $t = 0$ denoting the first year after each reform), and then stacking the CPS data for the 31 events. The window around each reform runs from event time -5 to +5, except for the federal reform in 1993 (OBRA93) where the window runs from event time -5 to +2.[67] This avoids overlap between the 1993 EITC reform and TANF reform, which we cannot control for. Given the monthly files can be used only from 1989, to ensure that each reform uses consistent data across time, I use March CPS files alone for reforms that occurred before 1993 and March and monthly CPS files combined for reforms that occurred from 1993 onwards.

The stacked event study is based on the following specification

$$\begin{aligned} P_{imt} \quad = \quad & \sum_j \alpha_j \cdot Event_{j=t} + \beta \cdot Kids_i + \sum_{j \neq -1} \gamma_j \cdot Event_{j=t} \cdot Kids_i \\ & + \mathbf{I}_{\text{OBRA93}} \cdot \Big( \sum_j \delta_j \cdot Event_{j=t} \cdot Waiver_{sj} + \sum_j \zeta_j \cdot Event_{j=t} \cdot Kids_i \cdot Waiver_{sj} \\ & + \eta \cdot U_{st} + \theta \cdot U_{st} \cdot Kids_i + \lambda_s \Big) + \boldsymbol{X_i \phi} + \nu_{imt}, \end{aligned} \tag{10}$$

where the first line is the basic DiD event study specification, and the second and third lines add controls for welfare waivers, the business cycle, and demographics. The waiver and business cycle controls are switched on only for the 1993 federal reform ($\mathbf{I}_{\text{OBRA93}} = 1$) where they are necessary for identification. For the 2009 federal reform, the dummy variable $Kids_i$ is an indicator for having 3+ children (relative to 0 children), while for all other reforms it is an indicator for having any children. Notice also that, for the stacked event study, the state reforms are analyzed by comparing single women with and without children within each state. This is similar to the DiD analyses of federal reforms elsewhere in the paper, but different from the more involved synthetic control approach to state reforms in section 6.1 (which exploits variation both by the presence of children and across different states).

The results of this analysis are presented in Figure 13 in the main text and Figure A.XXIV in the appendix. Panel A of these figures is based on running specification (10) for the federal reforms

[66] These are the 27 state EITC reforms analyzed in section 6.1 along with four federal reforms: the 1975, 1986, 1993, and 2009 reforms. I exclude the 1990 reform as a separate event because of its small size and close proximity in time to the 1986 and 1993 reforms.

[67] The other exception is the state reform enacted in California in 2015. This reform allows for an event time window running only to +2.

alone, Panel B runs (10) for the state reforms alone, while Panel C runs (10) for the federal and state reforms combined. Because there is a gradual pre-trend in Panel C, the final panel considers an extension of (10) that adjusts for this pre-trend.

The pre-trend adjustment is done based on estimating linear, group-specific trends using only pre-reform data. This consists of two steps. First, using pre-reform data (event time -5 to -1), I run a version of equation (10) in which the event time dummies $Event_{j=t}$ in the first line are replaced by a continuous event time variable $t$. Hence, this specification includes the same control variables as the specification of interest. This yields pre-trend coefficients for those with and without kids, $\hat{\vartheta}_{k=1}$ and $\hat{\vartheta}_{k=0}$. Second, I residualize the outcome variable $P_{imt}$ using these coefficients, i.e. $\hat{P}_{imt} \equiv P_{imt} - \hat{\vartheta}_{k=0} \cdot t - \hat{\vartheta}_{k=1} \cdot t \cdot Kids_i$. Equation (10) is then run using $\hat{P}_{imt}$ as the outcome.

The individual reforms are reweighted to adjust for changes in CPS sample size over time. In an unweighted stacked regression, later reforms would tend to weigh more heavily than earlier reforms due to the increase in CPS samples over time. To adjust for this, the CPS weights are rescaled such that all federal reforms are weighted equally and all state reforms are weighted according to their share of the national population in 2016. Specifically, the rescaling factor for each reform equals $\frac{1}{s/pop_{2016}}$ where $s$ is the number of sample observations for a given reform and $pop_{2016}$ is the national or state population in 2016, depending on whether the observation is from a federal or state reform. This rescaling factor is multiplied by the individual CPS weights.