

HOW LABOR MARKETS AND WELFARE POLICIES SHAPE HEALTH ACROSS THE LIFE COURSE:

THE POTENTIALS AND LIMITATIONS OF NATURAL POLICY EXPERIMENTS

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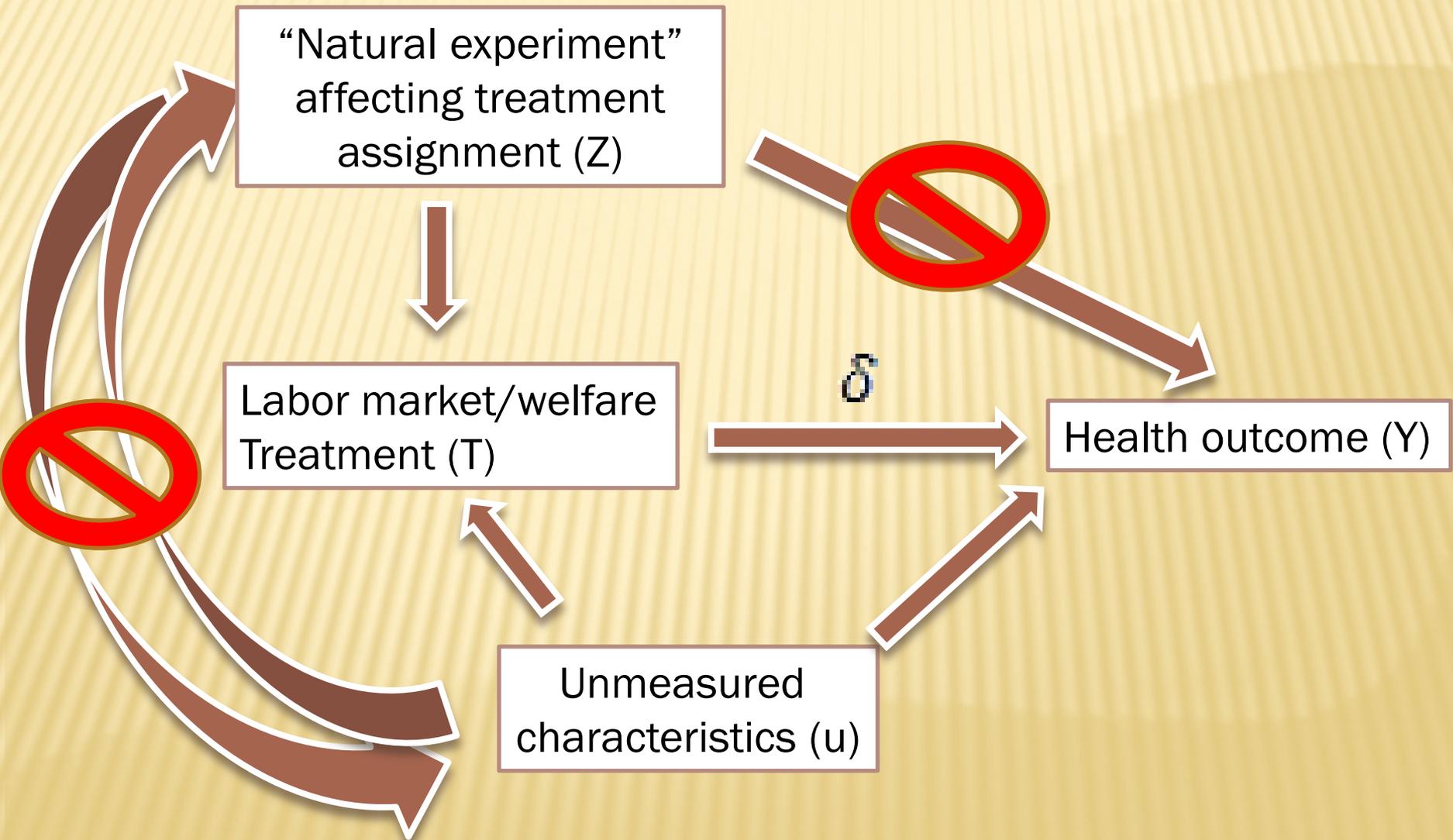
LABOR MARKETS, WELFARE POLICIES, AND POPULATION HEALTH

- ✘ **The Social Determinants of Health:** “Where we live, learn, work and play can have a greater impact on how long and how well we live than medical care.”
– RWJF *Commission to Build a Healthier America*
- ✘ **The Health Effects of “Non-Health” Policy:** There are likely to be unintended health costs and benefits to labor market and welfare policies.
- ✘ **Our old nemesis...unmeasured confounding:** “Assignment” to labor market and welfare “treatment” and “control” groups is typically non-random.

NATURAL EXPERIMENTAL APPROACH

- ✘ We try to recognize “naturally occurring” unique circumstances in which treatment assignment is uncorrelated with unmeasured characteristics related to the outcome.

LOGIC & ASSUMPTIONS OF NATURAL EXPERIMENTAL APPROACHES



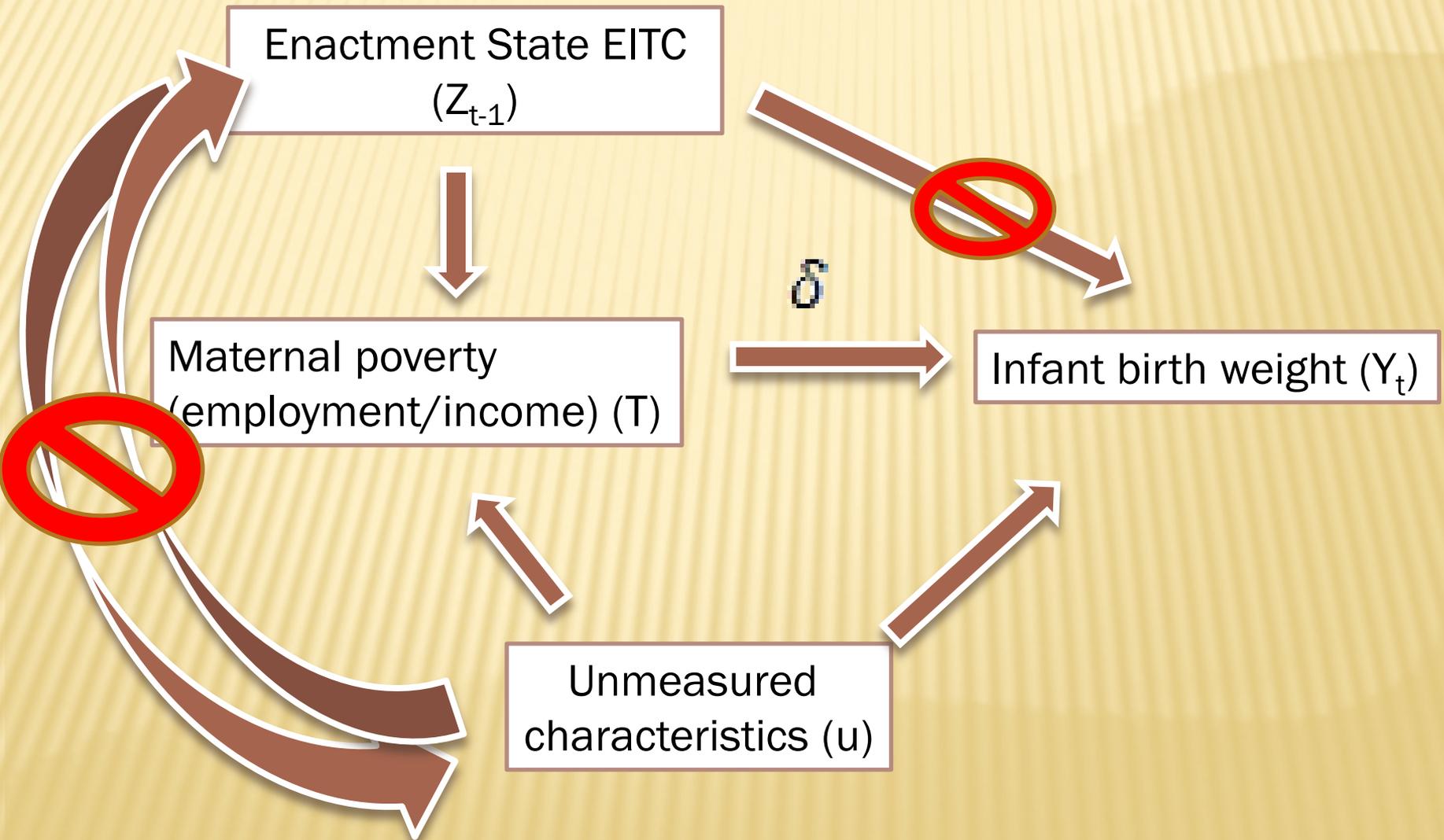
POLICY NATURAL EXPERIMENTS

- ✘ Typically relying on policy change that affected some subpopulations or geographic regions (treatment group), while not affecting others (control group).
 - + Often state variation over time.

EFFECTS OF PRENATAL POVERTY ON BIRTH WEIGHT: STATE EARNED INCOME TAX CREDITS (EITC) AS A NATURAL EXPERIMENT

Strully, K., D. Rehkopf, and Z. Xuan (2010). “The effects of prenatal poverty on infant health: State earned income tax credits and birth weight.” *American Sociological Review*. 75(4): 534-563.

POVERTY, EITC, AND BIRTH WEIGHT



TWO QUESTIONS...

1. Treating EITC primarily as a natural experiment for low-income mothers' income/employment, is there a causal effect of prenatal poverty on birth weight?
2. How have recent expansions of work-based welfare programs (e.g., the EITC) impacted child health?

THE EARNED INCOME TAX CREDIT (EITC)

- ✘ The EITC is a typically refundable tax credit designed to reduce the tax burden on, and supplement the incomes of, low-wage workers in the United States.
- ✘ Federal EITC administered by IRS since 1970s. But, since early 1980s, several states have enacted their own state EITCs as well.
- ✘ 1980-2002, 16 states enacted credits:
 - + Colorado, District of Columbia, Kansas, Maine, Maryland, Minnesota, New Jersey, New York, Oklahoma, Vermont, Wisconsin, Illinois, Iowa, Massachusetts, Oregon, Rhode Island
 - + e.g., CO credit 8.5-10%; MN 10%-33%; WI 5%(1 kid)-75% (3 kids)

VARIATION IN STATE EITCs AND BIRTH WEIGHT

Data

- ✘ 1980-2002 U.S. Natality Detail File
 - + Birth certificate data
- ✘ Samples limited to unmarried mothers with high school degree or less

DIFFERENCE-IN-DIFFERENCE MODEL OF STATE EITCs AND BIRTH WEIGHT (WITH STATE AND YEAR FE)

$$Y_{ist} = \beta_0 + \beta_1 \text{EITC}_{s(t-1)} + \beta_2 \text{Individual Controls}_{ist} \\ + \beta_3 \text{State Econ/Policy Controls}_{s(t-1)} + \beta_4 \text{State}_t \\ + \beta_5 \text{Year}_s + u$$

- **EITC**: whether a woman gave birth in a state with an EITC in a given year;
- **Individual Controls**: Maternal age, high school, race, and smoking (both predictor and outcome); baby sex
- **State Econ/Policy Controls**: WIC participation, minimum wage, Medicaid spending, unemployment rate, number poor, TANF work requirements, AFDC/TANF benefit size (quartiles)
- **State**: dummy variables for each of the U.S. states and DC
→ state fixed-effects
- **Year**: dummy variables for years (1980-2002)
→ year fixed-effects

EFFECTS OF STATE EITC AND AFDC/TANF ON BIRTH WEIGHT

	Birth Weight (OLS Regression)
State EITC	15.704*** (1.211)
N	8,762,028

EFFECTS OF STATE EITC AND AFDC/TANF ON BIRTH WEIGHT

	Birth Weight (OLS Regression)
State EITC	15.704*** (1.211)
2 nd AFDC/TANF Quartile	0.406 (1.205)
3 rd AFDC/TANF Quartile	3.403 (1.766)
4 th AFDC/TANF Quartile	8.415*** (2.641)
N	8,762,028

CONCLUSIONS, CAVEATS, NEXT STEPS

- ✘ Poverty relief through both EITC and AFDC/TANF appear to improve birth weight.
- ✘ Next steps/Teaser: Project (with Rehkopf and Dow) looking at EITCs and child obesity.
 - + Children of the National Longitudinal Survey of Youth (NLSY79)
 - + Main predictors: difference in a family's estimated EITC in given year (T) and one year later (T+1), using earnings /family structure in year T to estimate EITC.
 - + Reduces confounding from behavioral responses to EITC.

**OTHER EXAMPLES OF LABOR
MARKET/WELFARE POLICY NATURAL
EXPERIMENTS**

OTHER SELECTED EXAMPLES OF NATURAL EXPERIMENTS

Temporal and/or geographic variation in policy:

- ✘ Compulsory schools laws
 - + Lleras-Muney (2002): evidence that education reduces mortality
- ✘ Social security “notch”
 - + Snyder and Evans (2005): increases in social security benefits positively associated with mortality
- **Non-linear effects of education or income? Can these results be generalized to other populations?**

- ✘ **Other examples:**
- ✘ Lottery winnings (e.g., Lindhal 2005)
- ✘ Dutch famine (e.g., Susser 1994; Lumey and Stein 1997; and others)
- ✘ Casinos on tribal land (e.g., Wolfe et al. 2012)
- **Can these relatively rare income-generating events be generalized to more common ways that people get income (e.g., labor market)?**

CONCLUSIONS/LOOKING AHEAD

- ✘ Natural experiments are important for identifying the health effects of “non-health” policy. But, they are also limited.
 - + Difficult assumptions (internal validity);
 - + Some times limited generalizability (external validity).
- ✘ How can we strengthen them and/or reduce our reliance on them?
 - + Add repeated questions about people’s policy exposures and treatments to main national health datasets (e.g., NHIS, NHANES, BRFSS, etc).
 - ✘ Although need to be cognizant of potential reporting error.
 - + Possibilities for adding some degree of intentional randomization when we implement new policies?

EXTRA SLIDES

SELECTION INTO “TREATMENT” GROUPS

$$Y_i = \bar{Y}_c + T_i\delta + X_i + u_i$$

$$T^*_i = Z_i a + v_i$$

$$T_i = 1 \text{ if } T^*_i \geq 0$$

$$T_i = 0 \text{ if } T^*_i < 0$$

- ✘ **Natural experimental approach:** we try to recognize “naturally occurring” unique circumstances in which treatment assignment (Z) is uncorrelated with u .

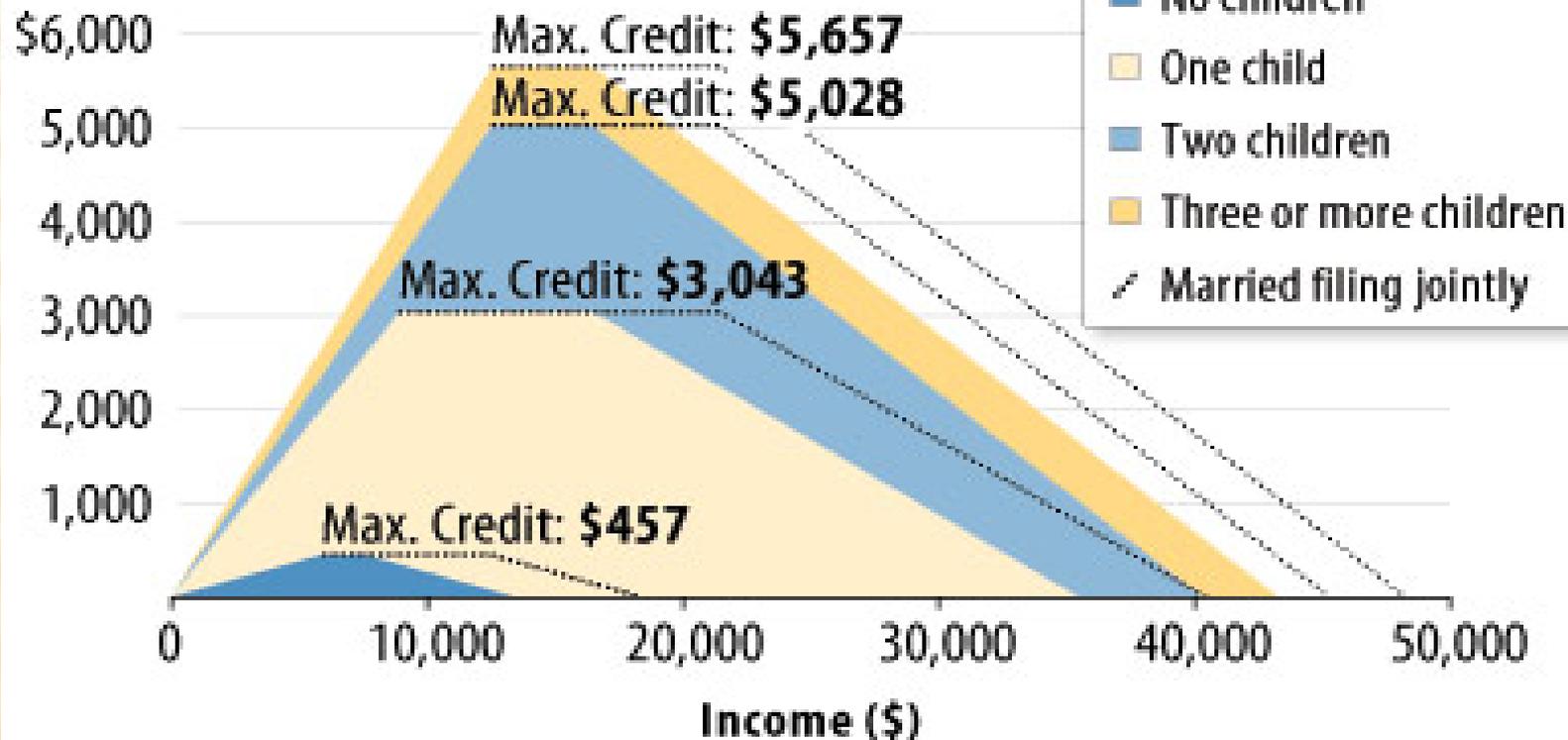
The EITC: Two-Part Exposure

1. Refundable tax credit for a given level of earnings
2. Employment incentives
 - + Evidence that federal EITC expansions increase labor market entry for less educated single mothers . We've replicated this for state EITCs.

STRUCTURE OF THE EITC

The Federal Earned Income Tax Credit in Tax Year 2009

EITC Credit Amount



Note: Married couples with income in the phaseout range qualify for a higher credit than singles—shown by dashed lines.

1980-2002 Natality Data: Means for Key Variables

Single mothers with high school or less

Birth weight	3215.97
State has EITC	.083
Smoked	.287
Mother Black	.417
Mother HS degree	.490
N	8,762,028

Effect of State EITCs & AFDC/TANF on Smoking

	Smoking Logistic Regression (Odds Ratios)
State EITC	0.949*** (0.006)
2 nd AFDC/TANF Quartile	1.013 (0.011)
3 rd AFDC/TANF Quartile	1.004 (0.013)
4 th AFDC/TANF Quartile	1.096*** (0.016)
N	5,260,202

Effect of State EITCs & AFDC/TANF on Birth Weight (adj for smoking)

	Birth Weight OLS Regression (States with smoking data)	Birth Weight OLS Regression (States with smoking data)
State EITC	15.662*** (1.500)	
2 nd AFDC/TANF Quartile	-7.196* (2.857)	
3 rd AFDC/TANF Quartile	-0.203 (2.234)	
4 th AFDC/TANF Quartile	-2.770 (3.879)	
Smoked		
N	5,254,642	

Effect of State EITCs & AFDC/TANF on Birth Weight (adj for smoking)

	Birth Weight OLS Regression (States with smoking data)	Birth Weight OLS Regression (States with smoking data)
State EITC	15.662*** (1.500)	12.510*** (1.471)
2 nd AFDC/TANF Quartile	-7.196* (2.857)	-5.629*** (2.815)
3 rd AFDC/TANF Quartile	-0.203 (2.234)	1.665 (3.188)
4 th AFDC/TANF Quartile	-2.770 (3.879)	1.567 (3.823)
Smoked		-220.216*** (0.589)
N	5,254,642	5,254,642

CAVEATS

- ✘ Internal and external validity of natural experiment
- ✘ No evidence of dose response
 - + Needs further tests with alternative EITC measures
- ✘ Estimates reflect average treatment effect; may not apply to particular cases/states

EFFECT OF STATE EITC ON BIRTH WEIGHT FOR ALTERNATIVE SAMPLES (NATALITY DATA)

	High Education	Married Sample	First Births
State EITC	-7.867 (5.939)	7.727*** (0.826)	5.267*** (1.178)
N	283,889	17,204,823	8,529,601