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Health benefits of social insurance

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Abstract

This paper studies the potential positive externality of unemployment insurance (UI) on infant birth outcomes. Taking advantage of variations of UI benefits across states and over time, we find that UI improves birth outcomes, including mean birth weight, full-term birth weight, low birth weight, fetal growth, and preterm birth. If all states apply the UI schedule of the most generous state (Massachusetts), the average birth weight increases by roughly 19 g.

KEYWORDS

birth outcomes, externality, fetal origin hypothesis, health utilization, prenatal care, social insurance, unemployment insurance

JEL CLASSIFICATION

H51, I13, I18, J65, P36

1 | INTRODUCTION

The unprecedented high levels of unemployment and income fluctuations during the great recession triggered a new wave of economic policy debates and political discourse on the role of the government. In particular, what the optimal level of government intervention is and what the safety net programs should cover. A social insurance program is evaluated based on the direct and indirect costs (e.g., moral hazard effects, displacement effects) and benefits (e.g., poverty reduction, consumption smoothing effects). However, the economic literature is biased toward evaluating the external costs of these programs and focused mainly on labor market outcomes. In this paper, we introduce a potential positive externality of one of the most important safety net programs in the US. We investigate the effect of unemployment insurance (UI) benefits on infants' birth outcomes.

The UI program is a temporary cash transfer program that aims to insulate income fluctuations among workers who were laidoff through no fault of their own. Although UI is a federally mandated program, each state holds its eligibility criterion and payment schedule as well as the duration of the UI payments. State-level differences in UI laws generate substantial cross-sectional variations of UI benefits. States also adjust their benefits in biannual periods for either common reasons such as inflation or state-specific reasons like economic conditions or the solvency of UI Trust Funds. We take advantage of the variations in UI benefits across states and over time as a source of a plausibly exogenous shock to the income of the unemployed individuals to examine the potential health effects of the cash transfers on infants.

The slow economic recovery after the Great Recession accompanied by larger payments and longer duration of payments stimulated a strand of studies revisiting the social costs and benefits of the UI program (Barr & Turner, 2015; Bitler & Hoynes, 2016; Card, Johnston, Leungs, Mas, and Pei, 2015; Card & Mas, 2016; Farber & Valletta, 2015; Howell & Azizoglu, 2011; Mueller, Rothstein, & Von Wachter, 2016; Tatsiramos & van Ours, 2014), as well as its unintended and unplanned externalities on other outcomes including crime (Beach & Lopresti, 2019), foreclosure (Hsu, Matsa, &

Melzer, 2018), alcohol abuse (Lantis & Teahan, 2018), cigarette smoking (Fu & Liu, 2019), health (Kuka, 2018), mental health (Tefft, 2011), college enrollment (Barr & Turner, 2015), and children's educational outcomes (Regmi, 2019).

For instance, Fu and Liu (2019) show that state-time increases in benefits increases in smoking cessation among UI eligible population while they do not affect UI noneligible population. Hsu et al. (2018) search for the potential effects of UI benefits in the housing market. They interact a *laidoff* status with their proxy of UI benefits and show that increases in UI benefits lead to reductions in mortgage delinquency and foreclosure among *laidoff* workers compared to other workers.

The contribution of the current study to this literature is twofold. First, it adds to the literature on the optimal design of UI by providing new evidence on its potential health effect. The seminal works of Baily (1978) and Chetty (2006) suggest a UI design based on cost-benefit trade-offs between labor supply disincentives and income-consumption smoothing effects. This paper offers new evidence on the positive externality of UI not reflected in their framework. Second, it adds to the small but growing literature of the Fetal Origin Hypothesis (Almond & Currie, 2011) by establishing a causal relationship between income and infants' birth outcomes. It highlights the importance of welfare programs on pregnancy outcomes, even the one that is neither permanent nor targeted toward pregnant women.

2 | DATA, ECONOMETRIC METHOD, AND RESULTS

The primary source of data is restricted version state-identified US Vital Statistics Natality Detailed files. It covers all birth records in the United States over the years 1989–2017, a period well before and after the great recession and also a time-frame that contains substantial changes in UI benefits.

We restrict the sample to first-time mothers as they might respond to the health of their child by their future fertility or a differential health investment for their second-and-higher birth (Wolpin, 1997). Also, some states provide additional payments under "*dependent allowance*". These facts could confound the precision of the estimates.[1] We also limit the sample to singleton birth as the outcome of plural birth is arguably driven by factors other than intrauterine determinants of infants' health.[2]

The UI benefit rules and payment schedule are obtained from biannual reports of Archived Significant Provisions of State UI Laws provided by the US Department of Labor. These laws vary at biannual frequency. Following Hsu et al. (2018), we proxy the UI benefits by the *maximum benefit,*[3] which is the *maximum weekly payment* times the *maximum weekly duration* of UI coverage.[4]

Since the Vital Statistics lacks information on mothers' employment status and UI eligibility, we try to impute a predicted value of their eligibility using Current Population Survey (CPS) data. Using the information on the employment and the reason for being unemployed in the CPS[5] , we compute a weighted share of eligible mothers in each state, year, month and each demographic group based on their race (white, black, others) and education (less than high school, high school and high school graduate, and some college and above). This share represents "*predicted eligibility*" of women based on their demographic, state, and time. We merge Vital Statistics data with the CPS-constructed file based on mothers' respective characteristics, state, and year-month of conception of birth. The new variable, *predicted eligibility,* varies from zero, for noneligibles, to one, for eligible mothers.

The empirical strategy rests on the assumption that UI law changes are not driven by nor correlated with other determinants of infants' health. It assumes that in the absence of law changes, the birth outcomes of *predicted eligible* mothers would have held their pre-law-change trends.

UI payments are more effective among mothers with higher *predicted eligibility*. To capture this potential heterogeneity of payments across mothers, we interact our proxy for benefits with the *predicted eligibility*. Specifically, we use the following Ordinary-Least-Square estimation strategy:

$$y_{idsmy} = \alpha + \delta Maximum\ Benefit_{smy} \times Predicted\ Eligibility_{idsmy} + \beta Maximum\ Benefit_{smy} + \theta Predicted\ Eligibility_{dsmy} + \phi X_i + \gamma Z_{smy} + \mu_s + \pi_{my} + \tau_s \times t + \varepsilon_{idsmy} \quad (1)$$

where y is the birth outcome of mother i in demographic group d in state s in month m and year y. X is a matrix of parental characteristics. Z is a matrix of state controls[6]. μ contains state fixed effects. π is a vector of time (month-by-year) fixed effects. $\tau_s \times t$ is a state-specific time (month-by-year) trend. Finally, ε is a disturbance term. As the laws vary at the state level, we cluster the standard errors on the state.

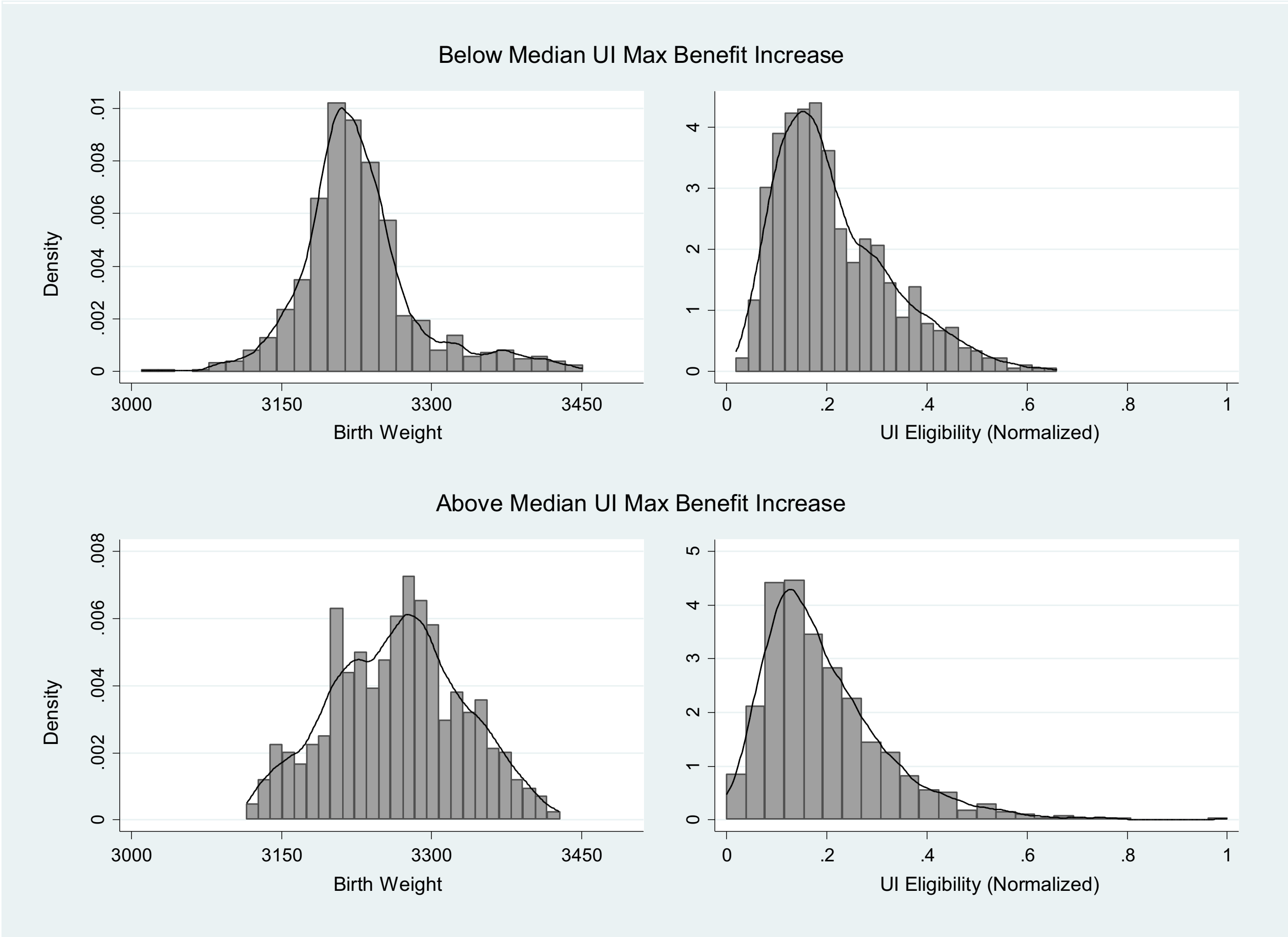

FIGURE 1 The distribution of birth weight and *predicted unemployment insurance (UI) eligibility* across states with above- and below-median of changes in UI benefits over the years 1989–2017 [Colour figure can be viewed at wileyonlinelibrary.com]

In this specification, δ measures the effect of a $1000 increase in *maximum benefit* on birth outcomes among mothers with *predicted eligibility* of one compared to mothers with *predicted eligibility* of zero.

Figure 1 depicts the distribution of birth weight and *predicted eligibility* across states with below-median (top panel) and above-median (bottom panel) UI benefit changes between the years 1989–2017. There is no visual difference in *predicted eligibility* for two sets of states. However, states that experienced higher changes in benefits have higher perceptible average birth weight compared to states with lower changes in benefits.

To explore the visually positive relationship between UI benefits and birth outcomes, we apply Equation (1) on the final sample. The main results are reported in Table 1. The *predicted eligibility* has a negative effect on birth outcomes. The estimated main effects are statistically significant for almost all outcomes. The main effects of m*aximum benefit* are very small in magnitude and insignificant in most cases. The interaction term captures the effect of payments among mothers who are *predicted eligible* versus those *predicted noneligible*. The respective coefficients suggest the positive externality of UI benefits on birth outcomes. A $3713 rise in *maximum benefit,* a one-standard-deviation increase over the sample period, is associated with roughly 50 g higher birth weight, a 1.5% increase from the mean. This effect also implies 40, 6, and 50 basis points decrease in the likelihood of low birth weight, very low birth weight, and preterm birth, equivalent to a reduction of 5.8%, 5.2%, and 2.9% from the mean of the respective variables.

The fact that UI benefits also have positive effects on gestational age (Column 8) raises another question whether the higher birth weights are driven solely by longer gestational age and fewer incidences of preterm birth or not. The estimated effect on *fetal Growth* (Column 9) implies 0.3 g rise in birth weight for each week of gestation, a 0.4% increase from the mean (compare with 0.4% effect for birth weight and 0.05% effect for gestational age). For a full-term birth, this

TABLE 1 Unemployment insurance benefits and birth outcomes (1989–2017)

	Outcomes:									
	Birth weight	**Low birth weight**	**Very low birth weight**	**Small for gestational age**	**Full-term birth weight**	**Gestational age adjusted birth weight**	**Gestational age**	**Preterm birth**	**Fetal growth**	**Apgar score**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Maximum benefit	0.18156	0.00001	0.00002	0.00002	0.28985	0.21529	0.00172	−0.00016	0.00070	−0.00664*
	(0.43295)	(0.00008)	(0.00003)	(0.00015)	(0.42034)	(0.25054)	(0.00235)	(0.00028)	(0.00957)	(0.00391)
Predicted eligible	−245.446***	0.06903***	0.01313***	0.09246***	−209.1923***	−80.7768***	−0.36470**	0.07998***	−5.7188***	−0.12361
	(41.9755)	(0.01116)	(0.00424)	(0.01637)	(4.0807)	(20.2188)	(0.15047)	(0.01714)	(1.0529)	(0.16766)
Predicted eligible × maximum benefit	13.5008***	−0.00403***	0.00063**	−0.00499***	11.3564***	4.5886***	0.02134**	−0.00502***	0.31224***	0.00558
	(3.4412)	(0.00084)	(0.00029)	(0.00123)	(3.2992)	(1.2410)	(0.00996)	(0.00114)	(0.08828)	(0.01369)
R^2	0.050	0.012	0.005	0.021	0.065	0.016	0.018	0.011	0.048	0.023
Mean DV	3283.764	0.069	0.012	0.110	3393.764	3274.738	38.993	0.171	83.978	8.845
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-by-month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State linear time trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	39,346,874	39,346,874	39,346,874	39,143,799	30,938,449	39,346,874	39,143,799	39,143,799	39,143,799	33,695,304

Note: Each column represents a separate regression. Standard errors, clustered on the state, are reported in parentheses. Mothers' characteristics include: age, age squared, race, Hispanic origin, education, smoker status, and the number of cigarettes smoked during pregnancy. Fathers' characteristics include: Hispanic origin, race, and age. Also, there are missing indicators for any missing values regarding parental characteristics. State-by-year controls include: a series of dummies to capture the passage of Affordable Care Act; Gross State Product per capita; union coverage rate; unemployment rate, share of black population, share of white population, share of male population, share of population aged 25–65; average weekly wages; personal income per capita; log of current transfer receipts; minimum wage; health expenditure per capita; education expenditure per capita; Medicaid coverage rate; and a series of dummies to capture any welfare reforms over the sample period. The *maximum benefit* is measured in thousand dollars. All dollar values are converted into 2017 real dollars. ***Birth weight*** is measured in grams. ***Low birth weight*** is defined as a birth weight less than 2500 g. ***Very low birth weight*** is defined as a birth weight less than 1500 g. ***Small for gestational age*** is a dummy variable that equals one if the birth weight lies at the bottom ten-percentile of birth weight distribution in each gestational week and zero otherwise. ***Full-term birth weight*** is the birth weight of those who were born between 37 and 42 weeks of gestation. ***Gestational age adjusted birth weight*** is the predicted value of birth weight from a regression of birth weight on dummies for gestational weeks. ***Fetal growth*** is birth weight divided by gestational weeks and its unit of measure is grams/week of gestation. ***Gestational age*** is measured in weeks. ***Preterm Birth*** is a dummy that equals one if the gestational age is less than 37 weeks and zero otherwise. ***Apgar score*** ranges between 1 and 10.

***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

marginal effect accumulates to roughly 11.4 g (compare with 13.5 g implied effect from Column 1). Therefore, the higher intrauterine nutritional intake is the main factor in birth weight improvements rather than a longer gestational period.

The impact of UI benefits is potentially heterogeneous based on parental socioeconomic characteristics. For instance, we expect that low-educated mothers benefit more from temporary cash transfers than high-educated mothers. To explore this differential impact, we interact a dummy for *low-educated* status (if education≤12 years of schooling) by the interaction between *maximum benefit* and *predicted eligibility*. The triple interaction term is reported in Table 2. The estimated effects show that the positive externality of UI benefits for infants' health is more pronounced among low-educated mothers compared to high-educated mothers. Although in some cases they are imprecisely estimated, the coefficients are economically large and meaningful. For instance, a $1000 increase in *maximum benefit* is associated with 27 basis points higher reduction in the likelihood of low birth weight among low-educated mothers compared to the reference group.

These effects are robust when we replace *maximum benefit* with alternative measures of UI generosity such as *maximum weekly pay, log of maximum benefit,* and *maximum benefit per wage* as well as a log-log specification (Data S2).[7] The effects are heterogeneous across races and outcomes (Data S3). The main results are also robust when we assign UI benefits at first, second, and third trimesters (Data S4).

The results are comparable but slightly larger in magnitude to findings of Hoynes, Miller, and Simon (2015) who investigate the effect of Earned Income Tax Credit on infant birth outcomes. They find that a $1000 increase in earned income tax credit payments raises infants' birth weight by roughly 7 g and reduces the low birth weight by 0.3 percentage points. These marginal effects are comparable to our main findings in columns 1 and 2 of Table 1.

Furthermore, we can compare the marginal effects with those of other parental characteristics. For instance, the marginal effect of a $1000 increase in *maximum benefit* on low birth weight (40 basis points)[8] is almost half the marginal effect of a dummy for mother being married (84 basis points) and is equivalent to a 0.8 years increase in mother's age.[9]

3 | CONCERNS OVER ENDOGENEITY

One concern in this analysis is that states change their UI laws in response to past or contemporaneous economic conditions. Since the economic conditions are among the determinants of infants' health, this association could point to an omitted variable bias. Table 3 shows the state-year panel regressions of *maximum benefit* on economic conditions and labor union coverage rates. The results show no consistent and strong evidence of this concern. There is no statistically significant association between *maximum benefit* and unemployment rate, employment rate, and union coverage. However, the coefficients on wages are slightly significant in Column 3 (p-value $= 0.103$) and Column 5. We control for this potential confounding factor by including wages as a control variable in all regressions. Including four period lags of the independent variables and also adding a state trend (results not reported here) does not change the significance of the results for other variables.

Another concern about the exogeneity of the UI laws is that the laws are associated with changes in other state welfare programs that, by their potential impact on birth outcomes, could attenuate or inflate the estimations. The state-year panel regressions, shown in Table 4, reveal no evidence of such association. There is no statistically significant relationship between the UI *maximum benefit* and state welfare payments, minimum wage, Medicaid share, and also health and education expenditure. The coefficient on total UI payments in a log–log specification (Column 6, panel A) is roughly 1, which further confirms our choice of proxy.

The cash transfers act as a shock to households' income and so their demand for all normal goods increases. Assuming that children are normal goods, UI payments have the potential to raise fertility. If such fertility decisions are correlated with other determinants of birth outcomes, the estimated coefficients of Equation (1) will be biased. For instance, if the benefits encourage more disadvantaged women to have children, then the estimated coefficients will understate the true effects. We investigate this source of endogeneity by replacing the outcome in Equation (1) by the fraction of birth within each state-year-month cell to different demographic groups. The results are reported in Table 5. Among *predicted non-eligible* mothers, the main effects of *maximum benefit* are not correlated with mothers' demographic share. The only slightly significant coefficient is for the share of mothers aged 20–30. Focusing on the interaction term, there is a slightly significant reduction in birth to high-educated mothers (some college and above). This reduction may understate the true effects since high-educated mothers have healthier infants for other unobservable reasons that we cannot control for. For the rest of the outcomes, the respective coefficient is insignificant. There is no evidence that the fraction of births to

TABLE 2 Estimated effects of interacting a low-educated dummy with the interaction term

	Outcomes:									
	Birth weight	**Low birth weight**	**Very low birth weight**	**Small for gestational age**	**Full-term birth weight**	**Gestational-age adjusted birth weight**	**Fetal growth**	**Gestational age**	**Preterm birth**	**Apgar score**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Low-educated × Predicted eligible × maximum weekly benefits ($1000)	6.003 (3.692)	−0.00276*** (0.00091)	−0.00075 (0.00057)	−0.00268* (0.00145)	4.855 (3.189)	5.152** (2.114)	0.08541 (0.08498)	0.03738* (0.01815)	−0.00492** (0.00219)	0.00163 (0.01748)
R^2	0.050	0.012	0.005	0.021	0.065	0.016	0.048	0.018	0.011	0.023
Mean DV	3283.764	0.069	0.012	0.110	3393.764	3274.738	83.978	38.993	0.171	8.845
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-by-month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State linear time trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	39,346,874	39,346,874	39,346,874	39,143,799	30,938,449	39,346,874	39,143,799	39,143,799	39,143,799	33,695,304

Note: Each column represents a separate regression. Standard errors, clustered on the state, are reported in parentheses. Mothers' characteristics include: age, age squared, race, Hispanic origin, education, smoker status, and the number of cigarettes smoked during pregnancy. Fathers' characteristics include: Hispanic origin, race, and age. Also, there are missing indicators for any missing values regarding parental characteristics. State-by-year controls include: a series of dummies to capture the passage of Affordable Care Act; Gross State Product per capita; union coverage rate; unemployment rate, share of black population, share of white population, share of male population, share of population aged 25–65; average weekly wages; personal income per capita; log of current transfer receipts; minimum wage; health expenditure per capita; education expenditure per capita; Medicaid coverage rate; and a series of dummies to capture any welfare reforms over the sample period. The *maximum benefit* is measured in thousand dollars. All dollar values are converted into 2017 real dollars.

***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

TABLE 3 State economic conditions and UI maximum benefits

	DV: UI maximum benefit (2017$)				
	(1)	(2)	(3)	(4)	(5)
Unemployment rate	−62.12 (90.77)	-	-	-	85.44 (69.15)
Employment rate	-	133.32 (130.04)	-	-	31.53 (131.74)
Wage	-	-	9.76 (5.88)	-	10.32* (5.64)
Union coverage rate	-	-	-	−13.58 (41.11)	−38.57 (35.74)
R-squared	0.87	0.87	0.87	0.87	0.88
Observations	2856	2856	2754	2856	2754

Note: Each column represents a separate regression. The state-year panel covers the years 1989–2017. All regressions are weighted by the average state population and include state and year fixed effects. Standard errors, clustered on the state, are reported in parentheses. The *maximum benefit* is measured in thousand dollars.

Abbreviation: UI, unemployment insurance.

TABLE 4 Unemployment insurance benefits and other state welfare programs and expenditures

	Dependent variable:							
	Log health expenditure	Log education expenditure	Minimum wage	Log transfer receipt	Log maintenance benefits	Log UI payments	Log other welfare payments	Medicaid share
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Log Benefits								
Log max benefit	−0.033 (0.050)	0.116 (0.212)	0.318 (0.239)	0.032 (0.053)	0.051 (0.085)	0.972*** (0.126)	0.015 (0.050)	0.532 (0.898)
Panel B. Level of Benefits								
Max benefit ($1000)	−0.006 (0.005)	0.003 (0.020)	0.046 (0.029)	0.001 (0.005)	0.004 (0.007)	0.087*** (0.013)	−0.0002 (0.005)	0.096 (0.102)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Economic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2754	2754	2856	2856	2856	2856	2856	2856

Note: Each cell represents a separate regression. The state-year panel covers the years 1989–2017. All regressions are weighted by the average state population and include state and year fixed effects. Standard errors, clustered on the state, are reported in parentheses. Controls include average wages, unemployment rate, union coverage, and log of gross state product per capita. All dollar values are converted into 2017 dollars.

(*predicted eligible*) whites, blacks, Hispanics, unmarried, and low-educated mothers and also mothers of different age groups changed as a response to UI law changes. The only exception is among mothers with education above high school (Column 4). However, the interaction term is only significant at the 10% level. In Data S4, we also show that there is no selective fertility as a response to the lag of UI benefits.

4 | CONCLUDING REMARKS

This study documented the impact of a temporary and untargeted cash transfer on infants' birth outcomes. Using the plausibly exogenous variation of UI benefits over 29 years and comparing differentially impacted mothers based on their *predicted UI eligibility* status, we found positive externality of UI payments for infants' health measures. We did not find any systematic evidence that the UI benefits are driven by other economic conditions that also affect birth

TABLE 5 Unemployment insurance benefits and selective fertility

	The fraction of birth in each state-year-month to mothers with the following characteristics:										
	Married	**Hispanic**	**Educ ≤12**	**Educ ≥12**	**Race: White**	**Race: Black**	**Race: Others**	**Age:** [10, 19]	**Age:** [20, 30)	**Age:** [30, 40)	**Age:** [40, 55]
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
Maximum benefit	−0.0010 (0.1359)	−0.4177 (0.3829)	0.0958 (0.2764)	0.4944 (0.4925)	−0.0124 (0.1039)	0.0635 (0.0484)	0.00001 (0.0104)	0.0611 (0.0426)	−0.1437* (0.0821)	0.0957 (0.0726)	−0.0131 (0.0105)
Predicted eligible	−8.455 (9.466)	14.887 (21.925)	69.739 (66.051)	194.419* (98.465)	−14.262** (5.662)	9.313** (3.777)	0.7539 (0.7372)	−0.4589 (3.9124)	−15.162** (7.429)	14.652** (6.196)	0.9695 (0.6844)
Predicted eligible × maximum benefit	0.5059 (0.6750)	−2.064 (1.613)	−4.422 (4.985)	−14.308* (7.528)	0.1129 (0.3767)	−0.0515 (0.2949)	−0.0305 (0.0615)	−0.0084 (0.2498)	0.6520 (0.5092)	−0.6406 (0.4091)	−0.0029 (0.0401)
R^2	0.895	0.796	0.732	0.510	0.977	0.988	0.973	0.970	0.881	0.973	0.876
Mean DV	0.5763	0.0705	0.4464	0.4918	0.7956	0.1319	0.0211	0.2093	0.5665	0.2133	0.0108
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,524	16,524	16,524	16,524	16,524	16,524	16,524	16,524	16,524	16,524	16,524

Note: Each column represents a separate regression. All regressions are weighted using average of birth counts in each state-year-month cell. Standard errors, clustered on the state, are reported in parentheses. Fixed effects include state, year, month, and an interaction between year and month. Mothers' characteristics include: age, age squared, race, Hispanic origin, education, smoker status, and the number of cigarettes smoked during pregnancy. Fathers' characteristics include: Hispanic origin, race, and age. Also, there are missing indicators for any missing values regarding parental characteristics. State-by-year controls include: a series of dummies to capture the passage of Affordable Care Act; gross state product per capita; union coverage rate; unemployment rate, share of black population, share of white population, share of male population, share of population aged 25–65; average weekly wages; personal income per capita; log of current transfer receipts; minimum wage; health expenditure per capita; education expenditure per capita; Medicaid coverage rate; and a series of dummies to capture any welfare reforms over the sample period. The *maximum benefit* is measured in thousand dollars. All dollar values are converted into 2017 real dollars.

outcomes. There is no evidence that other state welfare programs, the potential determinants of health outcomes, accompanied the changes in UI benefits. We showed that selective fertility and socio-demographic compositional changes in births as a response to UI benefit changes did not bias the main results.

To put the results into perspective, had all states adopt the same benefit schedule as the most generous state (Massachusetts), the average birth weight of the nation would have been 19 g higher in 2017.[10]

It is worth noting that the UI payments are not targeted to the poor nor planned for pregnant mothers. Therefore, the results are intention-to-treat effects and understate the true effect of an income shock on pregnancy outcomes.

CONFLICT OF INTEREST

The authors have no conflict of interest to report.

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ENDNOTES

[1] This sample restriction is a common choice in the literature. See, for instance, Currie and Moretti (2003).

[2] This is also a common sample restriction in the literature. See, for example, Hill (2018) and Hoynes et al. (2015).

[3] All dollar values including UI benefits are in 2017 real dollars.

[4] Table S1 provides a summary of UI *Maximum Benefits* for all 51 states.

[5] The CPS asks about the reason of being unemployed for each person who is in labor force and currently claimed to be unemployed. These reasons are categorized as: job-losers on layoff, other job-losers, temporary job ended, job leaver, re-entrant, new entrant. We consider job-losers on layoff and other job-losers as the UI eligible population.

[6] These covariates are explained in tables' notes.

[7] Neither in the main results nor in the robustness checks are the coefficients on Apgar Score statistically and economically significant.

[8] Not reported in Table 1.

[9] The marginal effect of mother's age on low birth weight is −0.00489.

[10] In 2017, the average *maximum benefits* excluding Massachusetts was $11.53K while the respective value for Massachusetts was $33.13K (Table S1). Using the difference of these two numbers as the shock and marginal effect of Column 1 in Table 1 in addition to the fact that about 6.4% of mothers are *predicted UI eligible* (Table S2), one can get the aggregate effect of 18.6 g.

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