The Effects of Minimum Wages on Teenage Birth Rates

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Abstract

This study adds to a recently growing number of studies evaluating non-employment effects of minimum wages. Using U.S. data between 1995 and 2017, a period with 380 state-level minimum wage increases, I estimate the effect on teenage birth rates (age 15-19). I find that a $1 increase in minimum wages is associated to a 2.8-3.4 percent decline in teenage birth rates, which corresponds to 1.1 to 1.3 fewer birth per 1,000 young women. My analysis shows that the effects are driven by states that also have state Earned Income Tax Credit (EITC) laws in place. Furthermore, I show that minimum wages are also associated with a 2.9 percent decline in birth rates among women aged 20 to 24, and with smaller but statistically significant declines in birth rates for women between the ages 25 to 39. These findings suggest that, rather than delaying childbearing age, minimum wage reduce overall birth rates.

Keywords: Minimum Wage, Teenage Birth Rate, Earned Income Tax Credit

JEL Codes: J13, J38, I10

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1) Introduction

Between 1996 and 2017, teenage birth rates (age 15-19) in the U.S. have declined from 54.4 to 18.8 births per 1,000 women. Previous research has shown that this negative trend improved both the well-being of young women and overall birth outcomes. Diaz and Fiel (2016) show that teenage pregnancies have negative effects on both educational attainment and earnings, whereas Cunnington (2001) points out that teenage pregnancy increases the risk of low birth weight, neonatal mortality, and prematurity. While there is no consensus about the reasons for the decline in teen birth rates, researchers have suggested that abstinence from sexual activity and increased use of birth control are potential explanations (Santelli et al., 2007; Lindberg et al., 2016). Other studies have shown that reductions in teen births are associated with economic conditions (Oltmans Ananat et al., 2013; Percheski and Kimbro, 2014; Schneider, 2017) and public policies, such as welfare reform (Lopoo and DeLeire, 2006) and Medicaid family planning waivers (Yang and Gaydos, 2010).

This study adds to the literature examining the determinant of teenage fertility rates by evaluating the role of minimum wages. To my knowledge, only two previous studies have examined the relationship between minimum wages and fertility so far. Focussing on teenagers (age 15 to 19), Bullinger (2017) provides evidence that a $1 increase in minimum wages reduces birth rates by about 2%, with the effects being driven by non-Hispanic White and Hispanic adolescents. A recent study by Wehby et al. (2020) finds no evidence for a statistically significant association between minimum wages and birth rates for low-educated women between the ages 18 to 44.

This study adds to the work by Bullinger and Wehby et al. (2020) in three ways. First, in addition to evaluating the effects of minimum wage changes, I test whether the presence of state-level Earned Income Tax Credits (EITCs) further enhance any potential effects of minimum wages on birth rates. Previous work by Neumark and Wascher (2011) provides evidence that a coupling of high minimum wages with state EITC laws positively impacts employment (Neumark and Wascher, 2011). Second, in addition to examining teen birth rates, this study evaluates the effects of minimum wages on birth rates for women in five additional age bands between the ages 20 to 44. The fact that the additional age bands used in my analysis are substantially more narrow than those used by Bullinger (2017) and Wehby et al (2020) allows evaluating potential the effects for older age groups in more detail in order to obtain a more comprehensive understanding of the association between minimum wages and birth rates.[1] For example, it allows evaluating whether young women potentially decide to delay pregnancies following increases in minimum wages. Furthermore, while many teenagers are affected by minimum wage increases, other age groups are also impacted. In 2019, among all workers paid hourly wages at or below the minimum wage in the U.S., 9.9 percent were women aged 16 to 19, 19.1 percent were women aged 20 to 24, and 37.5 percent were women above the age of 24. (Bureau of Labor Statistics, 2020). Finally, my study uses a 23-year long period that includes 380 minimum wage changes, whereas Bullinger (2017) exploits 234 minimum wage changes within a period of 12 years. While Wehby et al (2020) evaluate a 24-year period (1989 to 2012), the use of more recent data in this study allows me to include the 90 state minimum wage changes that occurred between 2013 and 2017.

While economists have extensively analyzed the effects of minimum wages on employment (see overview by Neumark et al., 2014) and poverty (e.g. Card and Krueger, 1995; Neumark and Wascher, 2002; Burkhauser and Sabia, 2007), uncertainty remains about how minimum wages affect labor market outcomes. In recent years, several studies have expanded the focus and examined potential effects of minimum wages on health outcomes

[1] In a falsification test, Bullinger (2017) shows that minimum wages do not affect birth rates of women between 30 and 54. Wehby et al. (2020) focus on women between the ages 18 and 44 in their main analysis, while also splitting their sample to estimate models for two the following two age groups: 18 to 29 and 30 to 44.

(e.g. Horn et al., 2017; Averett et al., 2017; Lenhart, 2017; Wehby et al, 2020). The findings by Wehby et al. (2020) are most relevant for this study since the authors show that higher minimum wages are associated with increases in birth weight.[2]

This study adds to the recently growing literature examining the effects of minimum wages on non-employment outcomes. Using data for the years 1995 to 2017, a period with six federal and 380 state-level minimum wage increases, I evaluate the effects of higher minimum wages on birth rates. My study provides evidence that a $1 increase in the effective minimum wage is associated with a decline in teen birth rates (age 15-19) by 2.8 to 3.4 percent, which correspond 1.1 to 1.3 fewer births per 1,000 teenagers. I find that this negative effect is enhanced by the presence of state-level EITC laws. When examining whether minimum wage changes affect birth rates of older women, I provide evidence that a statistically significant negative association is also observable for women aged 20 to 24, and, to a smaller extent, for women between the ages 25 to 39.

2) Minimum Wage and Fertility

Minimum wages could influence fertility rates among teenagers through a number of potential pathways. In a review of the literature on the determinant of teen childbearing, Penman-Aguilar et al. (2013) conclude that socioeconomic factors such as income, employment, education, or regional income inequality play key roles in explaining high birth rates among younger women in the U.S. It appears likely that these socioeconomic factors are mechanisms underlying the relationship between minimum wages and teenage birth rates.

More generous minimum wages can influence birth rates by providing a positive income boost to affected individuals and households. As shown in Appendix Table A1, according to 2019 data from the Bureau of Labor Statistics (2020), 17 percent of workers

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[2] Wehby et al. (2020) find that the effects are largest for young and married mothers and are driven by fetal growth rates.

earning at or below the minimum wage were between the ages 16 to 19. This suggest that the earning of this age group is likely to be affected following minimum wage policy changes. The additional income following the increase in minimum wages may reduce financial stress among low-wage workers (Reeves et al., 2017; Lenhart, 2017). Additionally, as shown by Lenhart (2020), the income boost may increase access to health care access and affordability. The Centers for Disease Control and Prevention (2020) emphasizes the need for access to regular health care services for teenagers to receive comprehensive health counseling and learn about advantages of delaying sexual activity and contraceptive options. In line with this, Lovenheim et al. (2016) show that teenagers' access to primary health care has a significant negative effect on teen birth rates (age 15-18).

Furthermore, minimum wages could affect teen birth rates through by impacting labor force participation. Previous findings on the relationship between minimum wages and teen employment are mixed. Some studies find no significant minimum wage effects on teen employment (Card, 1992a and b; Card and Krueger, 1994). Other work shows that an increase in the federal minimum wage increases the labor force participation of teenagers (Giuliano, 2013; Kahn and Lang, 1998), while some studies that higher minimum wages reduce teen employment (Neumark and Wascher, 1992 and 1994).

The potential income and employment effects of minimum wage increases could indirectly impact birth rates by changing the opportunity cost of time. While higher earnings may increase the opportunity cost of non-work activities, potential declines in employment may lead people to reallocate time to non-work and leisure activities due to easing of time constraints (Wehby et al. 2020). Lenhart (2019) provides evidence that higher minimum wages reduces time spent on health-related activities, while increasing time spent on leisure activities.

While the main focus of this study is to evaluate the relationship between minimum wages and teenage birth rates, I also examine whether birth rates of older women are affected by changes to minimum wage policies. The pathways discussed in this section are not restricted to teenagers, but might also extend to older age groups. Using data from the Bureau of Labor Statistics (2020), Appendix Table A1 shows that the share of women aged 20 to 44 earning at or below the minimum wage is substantially higher than for men, suggesting that female incomes might be affected to a larger extent by minimum wage changes. Lenhart (2020) shows that the effects of minimum wages on health care access and affordability extend to older individuals as well, which suggest that this channel might also play a role for older age groups as well.

3) Data and Methods

The study uses data on the number of births from the National Center for Health Statistics Vital Statistics System. The main outcome variable of interest is the birth rate (per 1,000) for women aged 15 to 19, which is measured by using the number of females aged 15 to 19 from the National Center for Health Statistics bridged-race intercensal population estimates.[3] Minimum wage data are obtained from the U.S. Department of Labor.[4] The effective minimum wage is defined as the higher of the state and the federal minimum wage. Table 1 provides an overview of all minimum wage changes during the period of this study, showing that there were 380 state-level and six federal policy changes. I convert nominal minimum wages to 2017 dollar wages using the Consumer Price Index – Urban Consumers. Given that any effects of minimum wage increases on birth rates are likely delayed, I estimate specification using one-year lagged real minimum wages. Figure 1 provides

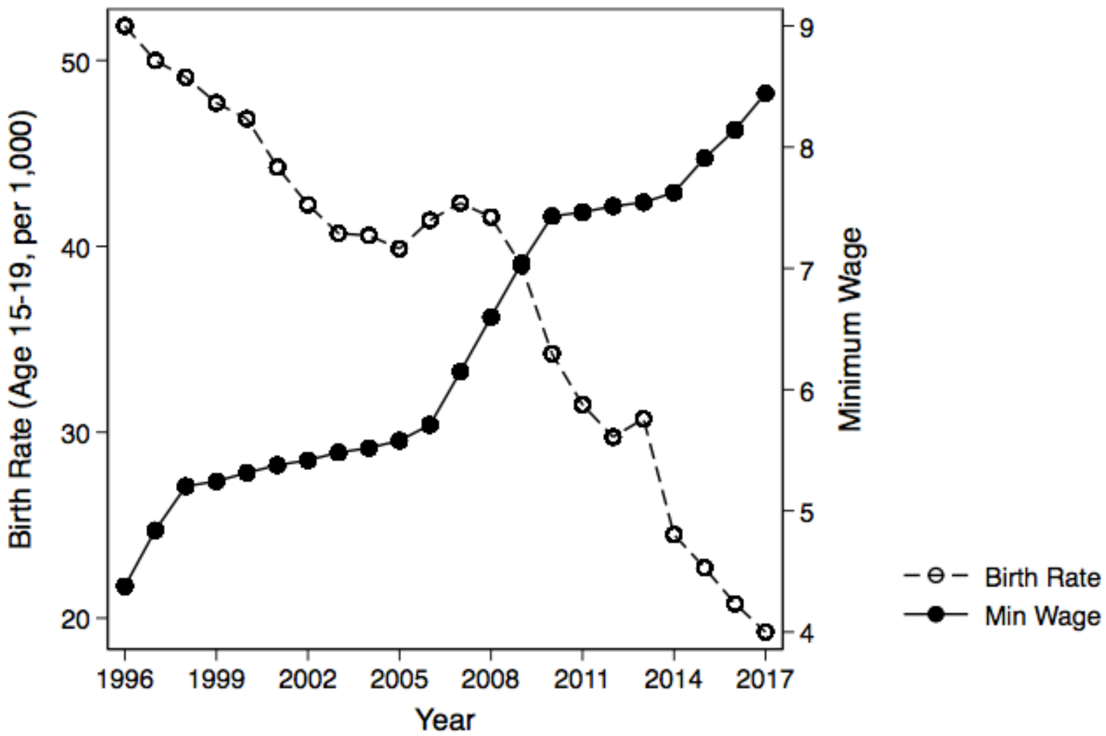
[3] This is the same approach used by Bullinger (2017). I take the same steps to obtain birth rates to evaluate the effects of minimum wages on birth rates among older age groups.
[4] See: https://www.dol.gov/whd/state/stateminwagehis.htm.

Table 1: State and Federal Minimum Wage Changes, 1995-2017

Year	States
1995	VT
1996	AR, CA, CO, CT, DE, FL, IA, IL, KY, LA, MA, MD, MI, MO, MS, MT, ND, NH, NV, RI, UT, VA, VT, WI, Federal
1997	AK, AL, AR, AZ, CA, CO, CT, DC, DE, FL, IA, ID, IL, KY, LA, MA, MD, ME, MI, MN, MO, MS, MT, NC, ND, NE, NH, NV, OK, OR, PA, RI, SC, SD, TN, UT, VA, VT, WI, WV, Federal
1998	AK, AL, AZ, CA, DC, IN, ME, OR, PA, SC, TN, Federal
1999	CT, DE, ID, IN, NJ, OR, RI, VT, WA
2000	CA, CT, DE, ID, KY, MA, NY, WA
2001	CT, GA, KY, MA, RI, TX, VT, WA, WY
2002	AK, CA, CT, HI, ID, ME, WA
2003	CT, HI, ME, NM, OR, WA
2004	CT, IL, ME, OR, RI, VT, WA
2005	DC, IL, ME, MN, NJ, NY, OR, VT, WA, WI
2006	CT, FL, HI, ME, MI, NJ, NV, NY, OH, OR, RI, VT, WV
2007	AL, AR, AZ, CA, CO, CT, DE, FL, HI, IA, ID, IL, IN, KY, LA, MA, MD, ME, MI, MO, MS, MT, ND, NE, NH, NY, OH, OK, OR, PA, RI, SC, SD, TN, TX, UT, VA, VT, WA, WI, WV, Federal
2008	AL, AZ, CA, CO, DC, DE, FL, IA, ID, IL, IN, KY, LA, MA, MD, ME, MI, MO, MS, MT, NC, ND, NE, NH, NM, NV, OH, OK, OR, PA, SC, SD, TN, TX, UT, VA, VT, WA, WV, Federal
2009	AK, AL, AZ, CO, CT, DC, DE, FL, GA, ID, IL, IN, KY, LA, MD, ME, MO, MS, MT, NC, ND, NE, NH, NJ, NM, NV, NY, OH, OK, OR, PA, SC, SD, TN, TX, UT, VA, VT, WA, WI, Federal
2010	AK, CO, FL, GA, IL, KS, MO, MT
2011	AZ, CO, IL, MT, NV, OH, OR, VT, WA
2012	AZ, CO, FL, MT, OH, OR, VT, WA
2013	AZ, CO, FL, MO, MT, OH, OR, RI, VT, WA
2014	AZ, CO, CT, DC, DE, FL, MO, MT, NJ, NY, OH, OR, RI, VT, WA
2015	AK, AR, AZ, CA, CO, CT, DC, DE, FL, HI, MA, MD, MI, MN, MO, MT, NE, NJ, NY, OH, OR, RI, SD, VT, WA, WV
2016	AK, AR, CA, CT, DC, HI, MD, MA, MI, MN, NE, NY, RI, VT, WV
2017	AK, AR, AZ, CA, CO, CT, DC, FL, HI, ID, MD, MA, ME, MI, MN, MO, MT, NJ, NY, OH, OR, SD, VT, WA

suggestive graphical evidence for an inverse relationship between minimum wages and teen birth rates. While average minimum wages have increased continuously, teen birth rates experienced a substantial decline throughout the study period. In line with previous work evaluating the relationship between minimum wages and birth rates (Bullinger, 2017; Wehby et al. (2020), I also use a measure of relative minimum wage as a measure of the "bite" of

Figure 1: Minimum Wages (Nominal) and Teenage Birth Rates:



the minimum wage in additional specifications. This measure is the ratio of the nominal minimum wage in the state to the prevailing state-specific median hourly wage.[5]

To evaluate the effects of minimum wages on birth rates, I estimate difference-in-differences (DD) models, as presented in Equation (1):

$$BIRTH_{st} = \alpha_0 + \alpha_1 MW_{st-1} + \alpha_2 X_{st-1} + \phi_s + \gamma_t + \psi_{st} + \varepsilon_{st} \quad , \qquad (1)$$

where $BIRTH_{st}$ is the log birth rate (per 1,000 women) in state s and year t, whereas MW_{st-1} represents one-year lagged real minimum wage or, in additional specification, the relative minimum wage. X_{st-1} is a set of controls accounting for potential state-level confounding

[5] The median wage is estimated from annual earnings and work hours from the March CPS. To address any endogeneity concerns from the minimum wage affecting median wage rates, I use the one-year lag of the median wage. This is in line with the approach taken by Wehby et al. (2020).

Table 2: Descriptive Statistics

Minimum Wage	
Minimum Wage (nominal)	6.36
	(1.35)
Minimum Wage (real)	5.38
	(1.81)
Relative Minimum Wage (Age 15-19)	0.91
	(0.09)
Relative Minimum Wage (Age 20-24)	0.74
	(0.09)
Relative Minimum Wage (Age 25-29)	0.59
	(0.09)
Relative Minimum Wage (Age 30-34)	0.53
	(0.08)
Relative Minimum Wage (Age 35-39)	0.50
	(0.10)
Relative Minimum Wage (Age 40-44)	0.50
	(0.10)
Number of Births (per 1,000)	
Age 15-19	37.77
	(16.15)
Age 20-24	97.07
	(23.83)
Age 25-29	114.43
	(18.92)
Age 30-34	93.14
	(13.95)
Age 35-39	42.15
	(10.34)
Age 40-44	8.45
	(10.34)
Observations	1,071

variables. These include unemployment rates, GDP per capita, the share of the state population below the age of 65 without any insurance coverage, TANF eligibility threshold (family of 3), average SNAP benefits per household, two indicators for the generosity of state-level EITCs (the size of the credit and whether the credit is refundable), an indicator for the presence of state-level Medicaid family planning wavers, as well as welfare reform waivers, time limits and sanctions.[6] ϕ_s and γ_t are vectors of state and year fixed effects, while ψ_{st} represents state-specific time trends (linear, quadratic and cubic), which are included to account for state-level factors that are not observed in the data. Finally, ε_{st} is a random error term. Table 2 provides descriptive statistics for the minimum wage and birth rate measures used in the analysis, while Appendix Table A2 shows summary statistics for the control variables.

4) Results

Table 3 presents the main findings of the analysis. The DD results in Panel A provide evidence that increases in minimum wages are associated with reductions in teen birth rates. Using one-year lagged minimum wages, I find that a $1 increase in the effective minimum wage reduces state teen birth rates by 3.43 percent ($p<0.05$). While slightly smaller in magnitude, the negative and statistically significant effect remains when including state-specific time trends. The estimates are larger than the effects found by Bullinger (2017) who shows that a $1 increase in minimum wages reduces birth rates by about 2%. Compared to the sample mean, the observed effects in Panel A correspond to a reduction in teenage births by 1.1 to 1.3 births per 1,000 women following a $1 increase in minimum wages. of state-specific time trends.

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[6] State unemployment data is collected from the Bureau of Labor Statistics, real GDP data comes from the Bureau of Economic Analysis, and information about the share of individuals without insurance is obtained Current Population Survey. Data on average annual state SNAP benefits is obtained from annual reports by the United States Department of Agriculture. Information on state EITC rates is obtained from annual reports by the Internal Revenue Service, while data for Medicaid family planning wavers comes from Kearney and Levine (2009) and the Guttmacher Institute. Data on TANF eligibility thresholds and state-level differences in welfare reforms waivers, time limits and sanctions comes from the Urban Institute Welfare Rules Database.

Table 3: Effects of Minimum Wages on Teenage Birth Rates
(Births per 1,000, Age 15-19)

	Teenage Birth Rates (per 1,000)			
	(1)	(2)	(3)	(4)
Panel A: Main Results				
1-Year Lagged MW	-0.0343***	-0.0286**	-0.0281**	-0.0276**
	(0.0142)	(0.0129)	(0.0129)	(0.0129)
Panel B: By State EITC Laws				
No State EITC	-0.0158	-0.0104	-0.0098	-0.0093
	(0.0250)	(0.0223)	(0.0221)	(0.0219)
Romano-Wolf p-value	[0.693]	[0.734]	[0.782]	[0.831]
State EITC	-0.0373***	-0.0324***	-0.0324***	-0.0324***
	(0.0111)	(0.0080)	(0.0081)	(0.0081)
Romano-Wolf p-value	[0.007]	[0.002]	[0.002]	[0.002]
Panel C: Relative Minimum Wage				
1-Year Lagged Relative MW	-0.1432***	-0.1134***	-0.1130***	-0.1126***
	(0.0515)	(0.0432)	(0.0431)	(0.0431)
Control Variables	x	x	x	x
State Linear Trends		x		
State Quadratic Trends			x	
State Cubic Trends				x
Observations	1,071	1,071	1,071	1,071

Robust standard errors, clustered by states, are shown in parentheses. The control variables include unemployment rates, GDP per capita, uninsurance rates, TANF eligibility threshold (family of 3), average SNAP benefits per household, state-level EITCs (size and refundability), as well as welfare reform waivers and sanctions. *p < 0.10, **p < 0.05, ***p < 0.01.

Panel B shows separate estimates for states with and without state-level EITC laws. In addition to showing robust clustered errors, I report p-values adjusted for testing two hypotheses using the Romano-Wolf stepdown procedure, which allows accounting for the probability of making any type I errors and accounts for dependence among the p-values by bootstrap resampling.[7] The results suggest that the effects in Panel A are driven by states that provide state EITC laws. This finding is consistent with the fact that the coupling of minimum wages and EITCs has cumulative effects on both direct outcomes (employment, as shown by Neumark and Wascher, 2011) and indirect outcomes (teen fertility). Finally, the relative minimum wage findings in Panel C show that the negative association between minimum wages and teen birth rates is robust to the use of an alternative measure of minimum wages, which is in line with findings by Bullinger (2017) and Wehby et al. (2020).

Table 4 presents DD effects of minimum wages on birth rates of older age groups. Again, I show p-values adjusted for testing five (Panel A and C) and ten (Panel C) hypotheses using the Romano-Wolf stepdown procedure in addition to providing robust clustered errors. I find that the estimate for women aged 20 to 24 is identical in magnitude to the corresponding estimate (including state quadratic time trends) for those aged 15 to 19 in Table 3, suggesting that birth rates of both age groups are equally affected by minimum wages. My analysis also finds negative and statistically significant associations between minimum wages and birth rates for the age groups 25 to 29, 30 to 34, and 35 to 39, whereas the size of the effects becomes smaller with age. Despite the decline in magnitudes, the estimates in Table 4 provide evidence that minimum wages impact fertility decisions across the age distribution. This suggests that higher minimum wages do not delay childbearing among younger women, but decrease overall birth rates among the entire population.[8]

[7] I use bootstraps with 1,000 resamples for all Romano-Wolf stepdown procedures used in the analysis.

[8] My findings for statistically significant effects on birth rates among older women is different from Bullinger (2017) and Wehby et al. (2020). I believe one explanation for this is that I use significantly smaller age groups than both these studies. Bullinger (2017), while also finding statistically significant effects for teenager aged 15 to 19, finds no effects for birth rates among women aged 30 to 54.

Table 4: Effects of Minimum Wages on Adult Birth Rates (Births per 1,000)

	Age 20-24	**Age 25-29**	**Age 30-34**	**Age 35-39**	**Age 40-44**
	(1)	(2)	(3)	(4)	(5)
Panel A: Main Result					
Effect of 1-Year Lagged MW	-0.0285***	-0.0185***	-0.0163***	-0.0098**	-0.0081
	(0.0079)	(0.0063)	(0.0046)	(0.0047)	(0.0081)
Romano-Wolf p-value	[0.004]	[0.008]	[0.007]	[0.048]	[0.540]
Panel B: By State EITC Laws					
No State EITC	-0.0227**	-0.0232**	-0.0113	-0.0131*	-0.0101
	(0.0090)	(0.0096)	(0.0073)	(0.0071)	(0.0135)
Romano Wolf-p-value	[0.029]	[0.032]	[0.181]	[0.107]	[0.742]
State EITC	-0.0135	-0.0088	-0.0159**	-0.0068	-0.0014
	(0.0098)	(0.0086)	(0.0068)	(0.0042)	(0.0085)
Romano-Wolf p-value	[0.262]	[0.385]	[0.046]	[0.237]	[0.985]
Panel C: Relative Minimum Wage					
1-Year Lagged Relative MW	-0.0766***	-0.0652***	-0.0565*	-0.0461**	-0.0258
	(0.0259)	(0.0221)	(0.0285)	(0.0178)	(0.0194)
Romano-Wolf p-value	[0.007]	[0.006]	[0.059]	[0.018]	[0.214]
Control Variables	x	x	x	x	x
Quadratic State Trends	x	x	x	x	x
Observations	1,071	1,071	1,071	1,071	1,071

Robust standard errors, clustered by states, are shown in parentheses. The control variables include unemployment rates, GDP per capita, uninsurance rates, TANF eligibility threshold (family of 3), average SNAP benefits per household, state-level EITCs (size and refundability), as well as welfare reform waivers and sanctions. The number of observations is smaller than in Table 3 because birth rates for these age groups are only available from 2008. *p < 0.10, **p < 0.05, ***p < 0.01.

5) Conclusions

The study finds that increases minimum wages reduce teen birth rates. Specifically, I show that a $1 increases in the effective minimum wage is associated with 1.1-1.3 fewer births per 1,000 young women between the ages 15 to 19. Comparing this effect to the proposed increase in the federal minimum wage by former President Obama from $7.25 to $10.10, my findings suggest that this policy change would reduce the number of births per 1,000 teenagers by between 3.7 and 3.9.

The estimates of this study suggest that reductions in teen birth rates in the U.S. over the last decades were partly driven by state-level minimum wages changes. In light of teen parenthood being associated with negative effects for children and mothers, and that costs related to health care and foregone tax revenues are often borne by the public, my findings suggest that higher minimum wages, especially if coupled with state EITC laws, can have unintended benefits to society.

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Appendix:

Table A1: Share of Workers Earning At or Below the Minimum Wage, By Age Group (2019)

Age Group	All	Women	Men
Age 16-19	17.0	9.9	7.0
Age 20-24	26.2	19.1	7.1
Age 25-29	16.0	10.5	5.5
Age 30-34	9.0	5.8	3.3
Age 35-39	6.3	3.7	2.6
Age 40-44	5.4	3.8	1.6

Source: U.S. Bureau of Labor Statistics (2020). Characteristics of Minimum Wage Workers, 2019. U.S. Bureau of Labor Statistics. https://www.bls.gov/opub/reports/minimum-wage/2019/home.htm.

Table A2: Descriptive Statistics – Control Variable

Control Variables	
Unemployment Rate (%)	5.52
	(1.91)
Uninsurance Rate (%)	12.95
	(4.32)
GDP (in million)	$294,050.80
	(361,309.70)
State EITC Law	0.37
	(0.48)
Refundable State EITC	0.34
	(0.47)
State EITC (% of federal)	5.87
	(10.49)
TANF Eligibility (max. income family of 3)	$750.60
	(342.26)
Average SNAP Benefits (per household)	$221.76
	(54.58)
Welfare Reform Waiver	0.47
	(0.50)
Observations	1,071