Recessions are Not Good for Your Health: the Counter-Cyclical Health Outcomes Revisited

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ABSTRACT

The net, positive, effect of unemployment at conception on birth outcomes in developed countries is likely overestimated in the literature. This is the consequence of ignoring the effects of unemployment during pregnancy. Using data from Israel, we not only confirm this finding but also find that the harmful effects of unemployment in the third trimester are large enough to offset any preceding positive effects. Stress and nutritional deficiencies due to economic contractions during pregnancy are at least as important as the positive self-selection at conception. This finding calls for policy intervention to support pregnant women even in developed countries.

Keywords: recession; health outcomes; birth weight; developed countries

JEL: E32, I12, E24

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1. Introduction

Economic fluctuations affect health in general, and child health in particular. Studies from developed countries, the U.S. in particular, showed that recessions can be "good for your health" (Ruhm, 2000; Chay and Greenstone, 2003; Dehejia and Lleras Muney, 2004). In contrast, most studies from developing countries showed that child health is procyclical (Paxson and Schady, 2005 for Peru; Bhalotra, 2010 for India; Cruces et al., 2012 and Bozzoli and Quintana-Domeque, 2014 for Argentina; Baird et al., 2011 for a large set of developing countries); an obvious exception is the study of Miller and Urdinola (2010) where they show that infant mortality increases with income in Colombia. The evidence from middle-income countries is mixed (Schady and Smitz, 2010).

Studies on the effect of economic fluctuations on birth outcomes ignored the effect of economic shocks during gestation,[2] thus arrived at the misleading conclusion that recessions are good for health in developed countries. Using aggregate birth and labor force data for Israel in the years 1993-2004, this paper shows that recessions during pregnancy have adverse effects on the weight of the newborn, even in the context of developed countries.

2. Data and Estimation

Aggregate birth weight data, with counts of low birth weight incidents (below 2500 grams) and very low birth weight incidents (below 1500 grams), come from the Birth Announcement File of Israel: a dataset which includes records about all live-births in Israel—whether in hospitals, birth centers, or at home. The aggregate data, for the years 1993-2004, are grouped by the sex of the newborn, ethnic group (Jewish or Arab), year and quarter of birth, and by the age group of the mother (less than 24 years old, 25-29, 30-34, 35 and above).

The unemployment rates by year, quarter, and nationality were calculated using 13 Labor Force Surveys (LFS), administered by the Central Bureau of Statistics (CBS), for the respective study years. The working file in this study is the product of merging the birth weight data with the unemployment data. Summary statistics of the main variables are reported in Table 1.

[2] One exception is Bozzoli and Quintana-Domeque (2014).

Table 1: Summary Statistics

	All		Arab		Jewish	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Unemployment Rate	8.89	1.54	10.47	2.52	8.65	1.49
Birthrate (per 1000 individuals)	20.73	1.18	29.13	3.06	18.55	1.18
Birthrate (per 1000 individuals aged 15+)	29.16	1.49	50.03	4.17	24.85	1.25
Percent of Arab babies	29.49	.94				
Percent Arab babies within age group	32.44	10.34				
Percent of Male babies	51.36	49.98	51.34	49.98	51.37	49.98
% Mothers aged 24 or less	23.41	42.34	36.01	48.00	18.15	38.54
% Mothers aged 25-34	59.11	49.16	51.72	49.97	62.19	48.49
% Mothers aged 35+	17.48	37.98	12.27	32.81	19.66	39.74
Birth weight (grams)	3216.8	75.77	3226.7	88.99	3212.7	69.16
% born below 2500 grams (LBW)	8.16	1.24	7.54	1.35	8.42	1.10
% born below 1500 grams (VLBW)	1.13	.30	1.02	.38	1.17	.26

Note: Unemployment rates are calculated from the LFS using weights provided by the CBS. Birthrate is the number of births divided by the relevant population in the cell (year-quarter-nationality). Population figures are available only on a yearly basis, and are taken from the Statistical Abstract of Israel. Adult population (15+), however, is calculated from the LFS and thus is available on a quarterly basis. The quarterly birthrate is multiplied by 4 to resemble the widely used annual birthrate. Percent Arab babies is the ratio of Arab births to total births by quarter and year (and age group).

The unemployment rate among Arabs is 1.8% higher. The percent of Arab babies, from all newborns, is about 29%. Interestingly, Arab babies are healthier: they weigh more, and the incidence of low birth weight among them is lower by 1% than that among their Jewish counterparts, despite their much lower income (see Asali, 2010 for a description of the Jewish-Arab income disparities in Israel).[3]

Another stark difference between Arab and Jewish mothers is the distribution of their ages: 36% of Arab mothers are 24 years old or younger, as opposed to only 18.2% of Jewish mothers. Older (35+) new mothers prevail among the Jewish population in contrast to the Arab population (19.7% versus 12.3%).

To test the effect of the cycle (proxied by unemployment) on babies' health, we estimate the following equation:

$$LBW_{mate} = \alpha + \beta_1 U1 + \beta_2 U2 + \beta_3 U3 + X_{mate}\beta_4 + \rho_a + \theta_t + \gamma_a(\rho_a t) + \varepsilon_{mate},$$

where *LBW* is the percentage of babies born with low birth weight (below 2500 grams), within the sex (m), age (a), year, quarter (t), and nationality (e) group. *U1* is the unemployment rate at conception and during the first trimester of pregnancy, *U2* is the unemployment rate during the second trimester, and *U3* is the unemployment rate during the third trimester. *X* includes controls

[3] This might resemble the "Hispanic paradox" describing the same phenomenon among Hispanics in the U.S.

for the nationality and sex of the newborn. ρ_a and θ_t stand for age fixed effects and year fixed effects. In the longer specification we include an age-specific time trend ($\rho_a t$). ε is the error term.

We first assume that β_2 and β_3 are zero, and run the parsimonious model which closely follows Dehejia and Lliras-Muney (2004), to estimate the effect of unemployment at conception (β_1). We then relax this assumption to see whether gestational unemployment has any effect on birth outcomes. Besides, given the cyclical nature of unemployment, omitting *U2* and/or *U3* renders β_1 overestimated in absolute value, as confirmed by the analysis in this study.

3. Results

First, we test whether birthrate itself is procyclical. This provides evidence to support a selection-based explanation of the effect of conception-time unemployment on birth outcomes. Table 2 provides the main results from this estimation.

Table 2: The effect of unemployment on the birthrate and percent Arab

	General Birthrate			Birthrate from Adult population			Percent Arab babies	
	All	Arab	Jewish	All	Arab	Jewish	Overall	Within age
Unemployment Rate (UR)	-.6042* (.3387)	-.8353 (.6074)	-.4973* (.2671)	-.9783** (.4239)	-1.716* (.9174)	-.6567* (.3290)	.2121 (.1477)	.5546** (.2408)
% Effect of 1% change in UR	-2.91	-2.87	-2.68	-3.35	-3.43	-2.64	0.72	1.71
Nationality	Y	N	N	Y	N	N	N	N
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Age FE and age-specific trend	N	N	N	N	N	N	N	Y
Observations	96	48	48	96	48	48	48	192
R^2	.8753	.5972	.5247	.9618	.5264	.3651	.6389	.9718

Note: see notes of Table 1. Unemployment is measured in the quarter of conception. All regressions are weighted using as weights the total number of births in the year, quarter, and nationality. Birthrate regressions include linear time trend. Robust standard errors are in parentheses.
* significant at the 10% level, ** 5%.

As is apparent from the table, the birthrate is procyclical for both populations, and the effects are similar (1% increase in unemployment reduces birthrate by 2.9% and 2.7% for the Arab and Jewish populations). The portion of the newborn Arabs is countercyclical. Fertility decisions are, therefore, affected by unemployment-induced selectivity.

Table 3 shows that the unemployment at conception (*U1*) has a positive effect on health outcomes (less probability of LBW), similar to the main findings of Dehejia and Lliras-Muney (2004) and respective studies for developed countries. A 1% increase in the unemployment reduces the incidence of LBW by 1.4-1.5%.

Table 3: The effect of unemployment on the incidence of low birth weight (LBW)

	All Mothers				Arab Mothers	Jewish Mothers
	(1)	(2)	(3)	(4)	(5)	(6)
Unemployment *U1*	-0.1126**	-.1232***	-.0900*	-.0969**	-.1070	-.1021**
	(.0469)	(.0465)	(.0483)	(.0479)	(.0809)	(.0512)
Effect of 1% increase in unemployment	-1.38	-1.51	-1.10	-1.19	-1.42	-1.21
Unemployment *U2*			-.0382	-.0403	.0409	-.0735
			(.0440)	(.0439)	(.0721)	(.0469)
Unemployment *U3*			.0812*	.0992**	.1210*	.1037**
			(.0419)	(.0415)	(.0699)	(.0415)
Male babies	-1.5566***	-1.5567***	-1.5566***	-1.5567***	-1.3209***	-1.6559***
	(.0564)	(.0558)	(.0563)	(.0557)	(.0927)	(.0605)
Jewish	.9377***	.9350***	.9371***	.9342***		
	(.0635)	(.0630)	(.0635)	(.0631)		
Year fixed effects	Y	Y	Y	Y	Y	Y
Age fixed effects	Y	Y	Y	Y	Y	Y
Age-specific trend	N	Y	N	Y	Y	Y
F-stat (p-value) of the null: $\beta_1 + \beta_2 + \beta_3 = 0$			0.45	0.29	0.18	1.00
			(.505)	(.590)	(.669)	(.318)
Observations	768	768	768	768	384	384
R^2	.6133	.6216	.6149	.6239	.5845	.7235

Note: *U1* is the first trimester (or conception) unemployment, *U2* is the second trimester unemployment, and *U3* is the third trimester unemployment. All regressions are weighted using as weights the total number of births in the year, quarter, age group, and nationality. Robust standard errors are in parentheses.
* significant at the 10% level, ** 5%, *** 1%.

However, the main difference from previous studies is that we account for the effects of unemployment *during* pregnancy (second and third trimesters), not only at conception. The effect budgeting mechanism, standing for the self-selection of women into pregnancy, plays a role in explaining the relationship between LBW and conception-unemployment only. Selection plays no role at later stages, conditional on being pregnant.

Doing so (columns 3-6) reduces the positive effect of conception-time unemployment (from 0.123 to 0.096) as expected. Moreover, it reveals the fact that high unemployment, once pregnant, has adverse effects on health outcomes (due to the induced stress and nutritional deficiencies, Bozzoli and Quintana-Domeque, 2014)—large enough to offset any positive effects it might have had when measured at conception. Taking column (4), for example, we see that a one percent increase in unemployment at conception time reduces the incidence of LBW by 0.097 (1.2%), but a similar increase in unemployment during the third trimester increases the incidence of LBW by a statistically significant 0.099 (1.22%), in effect offsetting the initial positive effect. (The effect in the second trimester is statistically insignificant.)

While jointly the unemployment rates at different periods of the pregnancy have mostly a statistically significant effect on LBW, the total effect of these is statistically not different from zero as shown in the table (F-stat for testing the null hypothesis that $\beta_1 + \beta_2 + \beta_3 = 0$). Unemployment, therefore, is *not always* "good for your health."

Incidentally the table also shows that male newborns are 1.5% less prone to LBW, and that the apparent lower incidence of LBW among Arab newborns is statistically significant.

4. Conclusion

Unemployment at conception might affect birth outcomes positively—most probably through selection channels as was pointed out in the literature. However, its net positive effect is likely overestimated in this literature. Not only this effect diminishes once unemployment in the second and third trimesters are accounted for, but the harmful effects of unemployment in the third trimester are large enough to offset any preceding positive effects. Stress and nutritional deficiencies due to economic contractions during pregnancy are at least as important as the positive self-selection at conception. This outcome calls for policy intervention, even in developed countries, to provide safety nets for pregnant women at least in the advanced stages of pregnancy.

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