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March 2016

Highly Educated Women No Longer Have Fewer Kids

This policy brief summarizes evidence that the cross-sectional relationship between fertility and women's education in the U.S. has recently become U-shaped. The number of hours women work has concurrently increased with their education. The theory that the authors advance is that raising children and home-making require parents' time, which could be substituted by services such as childcare and housekeeping. By substituting their own time for market services to raise children and run their households, highly educated women are able to have more children and work longer hours. The authors find that the change in the relative cost of childcare accounts for the emergence of this new pattern.



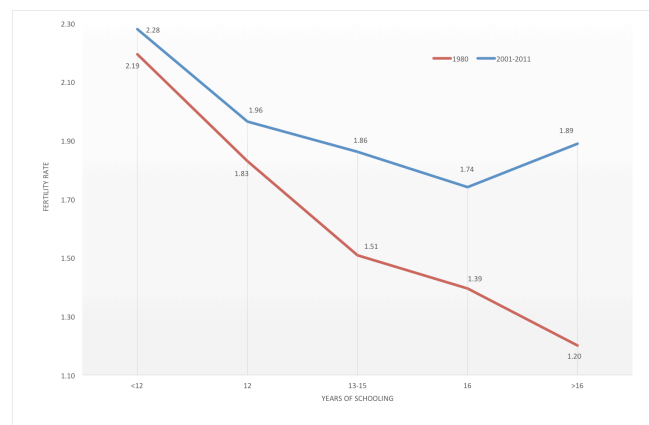
In 2012, the European Commission published a special report on “women in decision making positions”, suggesting legislation to achieve balanced representation of women and men on company boards. Some countries such as Norway, France, Italy, Belgium and the Netherlands have already taken legal measures in that direction. Trends in women's education give hope that such goals may be achieved as women are increasingly occupying more prestigious and demanding careers. Indeed, in today's world, women have surpassed men in higher education in most developed countries (Goldin et al 2006; Hazan and Zoabi 2015a).

What are the consequences of this important development for fertility? Historically, highly educated women have had fewer kids than less educated women (see, for example, Jones and Tertilt 2008). This relationship is deep rooted in the economic and sociological literature to the extent that many theories have already been proposed to explain this relationship. Leading explanations rely on the difficulty to combine children and career (Mincer, 1963; Galor and Weil, 1996) and the quantity-quality tradeoff (Becker and Lewis, 1973; Galor and Weil, 2000; Hazan and Zoabi 2006). The shift in women's education coupled with more demanding careers for women means that if the cross-sectional relationship between women's education and fertility is stable over time, then future fertility rates will continue to decline from their already historically low levels.

In Hazan and Zoabi (2015b) we find, however, that the cross-sectional relationship between women's education and fertility has changed from monotonically declining until the 1990s to a U-shaped pattern during the 2000s. This change is due to a substantial increase in fertility among women with advanced degrees who increased their fertility by 0.7 children, or by more than 50%. This is illustrated in Figure 1, which plots the cross-sectional relationship between fertility

and women's education in 1980 and during the period 2001-2011.

Figure 1: Fertility Rates by Women's Education, 1980 and the 2000s.

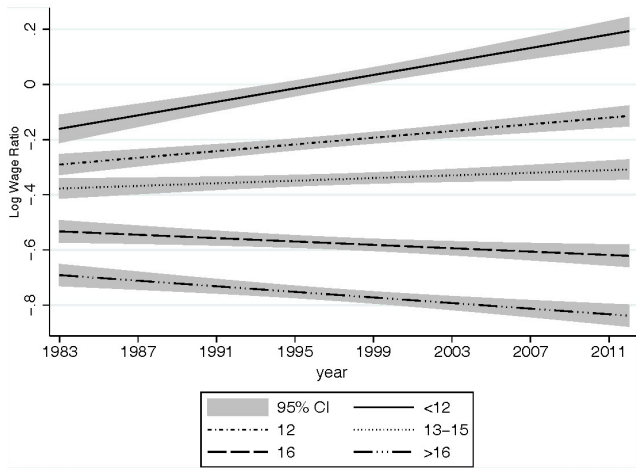


What can explain the rise of fertility among highly educated women during the period that saw the largest increase in the labor supply of highly educated women? We argue that the rise in college premium increased the demand for child-care and housekeeping services by highly educated women and a rise in the supply for such services by low educated women. This ‘marketization’ weakened the tradeoff between career and family life and enabled highly educated women to pursue demanding career without giving up on their desired family size.

To establish the relationship between the rise in the college premium and fertility of highly educated women, we use data from the March CPS for the period 1983-2012. We estimate the average hourly wage in the “child day-care services” industry and allow it to vary by state and year. In addition, we compute the hourly wage of all women in the 25-50 year-old age group who reported a positive salary income. Figure 2 presents the fitted values of the average of this variable for each of our five educational groups. The figure shows that childcare has become relatively more expensive for women with less than a college degree but relatively cheaper for women with a college or an advanced degree.



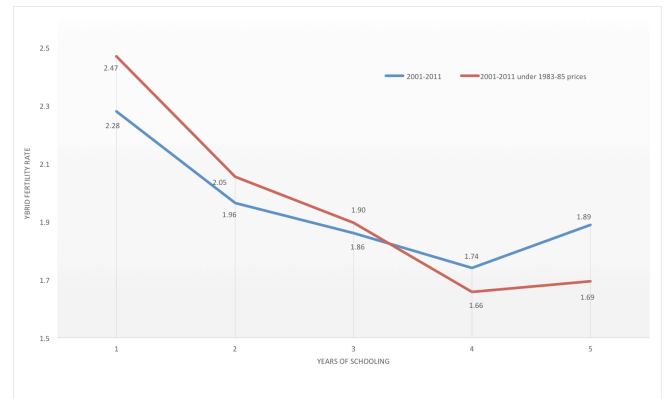
Figure 2: Linear Prediction of the Log of the Ratio of Average Wage in the Childcare Industry to Average Wage in the Five Educational Groups 1983–2012



To utilize the micro data we estimate regression models where the dependent variable is a binary variable that takes the value of one if a woman, living in a specific state in a specific year gave birth during that year and zero otherwise. Our main explanatory variable is the labor cost in the child daycare industry divided by the own wage of that woman. We show that there is a highly statistically significant and economically large negative correlation between this measure of childcare cost and the probability of giving a birth. In our empirical analysis we find that this change in the relative cost can account for about one-third of the increase in the fertility of highly educated women. We use a battery of tests to show that this correlation is not driven by selection of women into the labor market, by the endogeneity of wages, or by specific years over the last three decades.

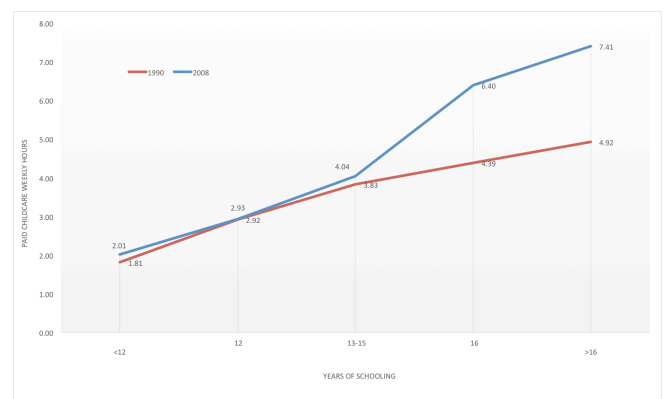
Figure 3 uses the estimates from the regression models described above and shows a hypothetical fertility for 2001-2011 under the 1983-1985 relative childcare cost. The figure shows that the hypothetical fertility curve is obtained by a clockwise rotation of the actual fertility curve around the group of women that has some college education.

Figure 3: 2000s Actual and Hypothetical Fertility under the 1980s prices of Childcare



Direct evidence on paid childcare services is consistent with this view. Figure 4 shows the average weekly paid childcare hours by all women aged 25-50 in 1990 and 2008. The figure has two salient features. First, in each of these years, paid childcare is increasing with women's education. Secondly, between 1990 and 2008, paid childcare hours have stagnated for women with up to some college education but have sharply increased for highly educated women.

Figure 4: Paid Childcare Weekly Hours for Women aged 25-50.



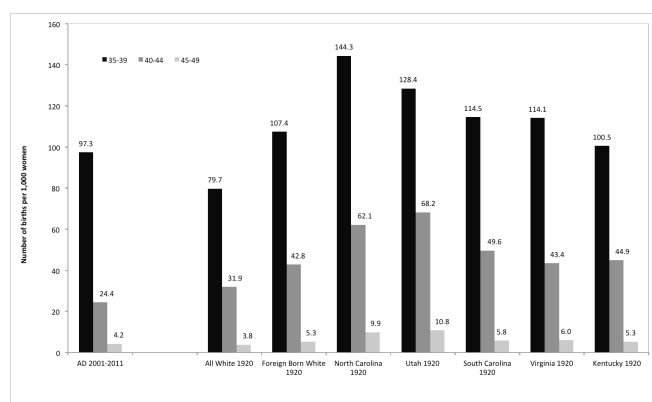
We then rule out potentially other explanations. What if the increase in labor supply stems from women who did not give birth during that year? To address this concern we shows that the cross-sectional relationship between education and usual hours worked for the sub-sample of women age 15-50 who gave birth during the reference period exhibit the same positive



correlation. Another concern might be that it is in fact the spouses who respond to a birth by lowering their labor supply enabling their wives to work more. Find that men who are married to highly educated women work more than men who are married to women with lower levels of education. Interestingly, fathers to newborns work more than husbands who do not have a newborn at home, regardless of the education of their wives. More importantly, usual hours worked by fathers to newborns monotonically increased with their wives' education. Thus, the spouses of highly educated women are not the ones substituting in childcare for their working wives.

Another concern our model may raise is that marriage rates differ across different educational groups. If married women have higher fertility rates and if more educated women have higher marriage rates, more educated women's higher fertility rates may not be caused by the availability of relatively cheaper childcare and housekeeping services, but rather simply by their higher marriage rates. We find that the fraction of women with advanced degrees who are currently married is somewhat lower than that of women with college degree.

Figure 5: Number of birth per 1,000 White Women in the US in Age Groups 35-39, 40-44 and 45-49: Women with Advanced Degrees (2001-2011) and Historical Rates.



A final potential explanation might be related to recent advancements in Assisted Reproductive Technology (ART) that enable women to combine long years in school without scarifying parenthood. We address this possibility in three ways. First, we show that historical levels of fertility rates among women above age 35 were higher than the levels during the 2000s (see Figure 5). This stands in contrast to the argument that highly educated women were not able to have higher fertility rates in the past due to medical reasons. Secondly, we note that ART accounts for less than 1% of births occurred during the 2000s. Finally, fifteen U.S. states have infertility insurance laws that provide coverage to infertile individuals. We compare fertility patterns by women's education in these states to the rest of the country and find no difference in fertility rates during the 2000s between the two groups of states.

The results of this study have several implications. For public policy, it highlights potential benefits from pro-immigration policies. Unskilled immigrants can potentially have positive effect on fertility via an increase in the supply of cheap home production substitutes. For many developed countries that are facing aging and shrinking population this may be something to consider. It also has consequences for economic growth. Given the strong correlation between parents' education and kids' education, an increase in the relative representation of kids coming from highly educated families means that the next generation is going to be relatively more educated. These are good news for economic growth.



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