

You Want What You Get: The Effect of Realized Fertility on Fertility Preference

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Abstract

Fertility preferences are critical in understanding fertility trends and in making reproductive policies. However, if fertility itself influences preferences, this would complicate its usage. This paper investigates if there exists a causal effect of realized fertility on desired fertility. I exploit the quasi-random occurrence of twins or the birth of a female child at first birth as an instrument for exogenous variation in realized fertility. Using data from 230 rounds of demographic and health surveys from 74 developing countries, I find that having an additional birth causally increases desired fertility by 0.15-0.30. Further, I find the result is unlikely to be driven by experiential learning but can be explained through either a model of reference-dependent preferences or ex-post rationalization. The result has important policy and research implications specifically when using fertility preferences to estimate excess fertility, the need for family planning programs, son preference, or as proxies for intrahousehold bargaining.

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1 Introduction

Desired fertility or Desired Family Size (DFS) is defined as the number of children an individual would ideally like to have over their lifetime and is an important metric often used by demographer and population scientists to understand determinants of fertility. As Bongaarts & Casterline wrote “Fertility preferences represent a key link in the chain of causation between fertility and its socioeconomic determinants”. (Bongaarts, 2003) Hence, there has been an equally wide interest in understanding the development and changes in desired fertility (???)

For developing countries, the most common source of data for desired fertility comes from the retrospective desired fertility questions asked in the Demographic and Health Surveys. There has been concerns about the framing of the question, how it may have different kinds of biases (?). A particular one that stands out is ex-post rationalization (??). Ex-post rationalization briefly implies that respondents would rationalize their response to include children that they may not have wanted to have ex-ante. However, we don’t have causal estimates of realized fertility on desired fertility.

This paper attempts to answer this question. Specifically, I ask, if there is an exogenous increase in realized fertility, does the response to the desired fertility question, as asked in the DHS, change. I find that an increase in realized fertility increases desired fertility. The most important implication of this finding is on the estimates of unwanted fertility. Generally, these estimates are computed by taking the difference between realized and desired fertility. However, if realized fertility has an impact on desired fertility, this implies we would be underestimating unwanted fertility in regions where fertility is high.

2 Data & Methods

I use data from the Demographic and Health Surveys (DHS). DHS is the primary source of data for fertility and health related outcomes in most of the developing world. It can be understood as the closest available substitute for vital statistics in these countries. I pool data from all 230 rounds of demographic and health surveys from 74 developing countries. I do find that the results (not included in this extended abstract) hold true even when dropping some of the biggest contributors in the sample (such as India).

I use the desired fertility questions. Particularly, the question asked of women with living children, *“If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?”*. I code this response as desired fertility. I will also use similar questions on the desired number of

sons or daughters to better understand if these results are driven by learning from experience or reflect ex-post rationalization.

Since people who wish to have more kids will say they want to have more kids, a simple regression is insufficient to tell us about the causal effect of having a child on the desired fertility. I attempt to answer this by using an Instrumental Variables (IV) design to estimate the causal effect of realized fertility on desired fertility. I use nature of first birth beign twins v/s singleton or female v/s male as instruments.

I use a Two-Stage Least Squares (2SLS) model to estimate these effect. The following two equations are estimated:

1st Stage: $Fertility_{is} = \alpha_0 + Z_{is}\sigma + X_{is}\theta + \gamma_s + \epsilon_{is}$

2nd Stage: $DesiredFertility_{is} = \beta_0 + \beta_1\hat{Fertility}_{is} + X_{is}\phi + \delta_s + \varepsilon_{is}$

$Fertility_{is}$ is fertility at the time of survey of individual i in survey round s , Z_{is} represents instruments: First born were twins and First born was female, X_{is} are individual level controls and include age, education level and rural residence, γ_s represent survey (country X round) fixed effects. Under the assumption that the instrument(s) have an effect on desired fertility only and only through realized fertility, β_1 identifies the causal effect of realized fertility on desired fertility.

3 Preliminary Results

Foremost, Figure 1 shows the raw plots of desired fertility for different age group of women at the time of interview by the nature of their first birth. It is evident that irrespective of which isnturment and which age group one chooses to compare, the desired fertility is higher for the group for which we expect realized fertility to be exogenously higher.

In Table 1 I estimate the first stage equation to show that both the instruments increase realized fertility. Having twins increases realized fertility by 0.66 while having first feamle birth increases it by 0.13. This satisfies the first condition of relevance i.e. instruments increasing realized fertility. I would include a discussion of the exclusion restriction i.e. they don't affect realized fertility through any other causal mechanism but through realized fertility in the full submission.

Table 2 shows the second stage results. Columns (2) and (3) show the reduced form effect i.e. the difference in realized fertility of twins v/s singleton (column 2) and female v/s male first birth (column 3). Finally, columns (4), (5) and (6) show the causal effect of realized fertility on desired fertility for the twin isnturment (4), the first female instrument (5) and

both instruments (6). The estimates range from 0.15 - 0.30. This can roughly be understood as 15 - 30% women including the extra birth in their desired fertility.

4 Further Analysis

I will be including robustness checks for the instruments used. There is some evidence that twinning is more common in women with high SES status and that under sex-selective abortions, the sex of the first child would also not be random. I would include analysis to verify that such possibilities do not affect the results.

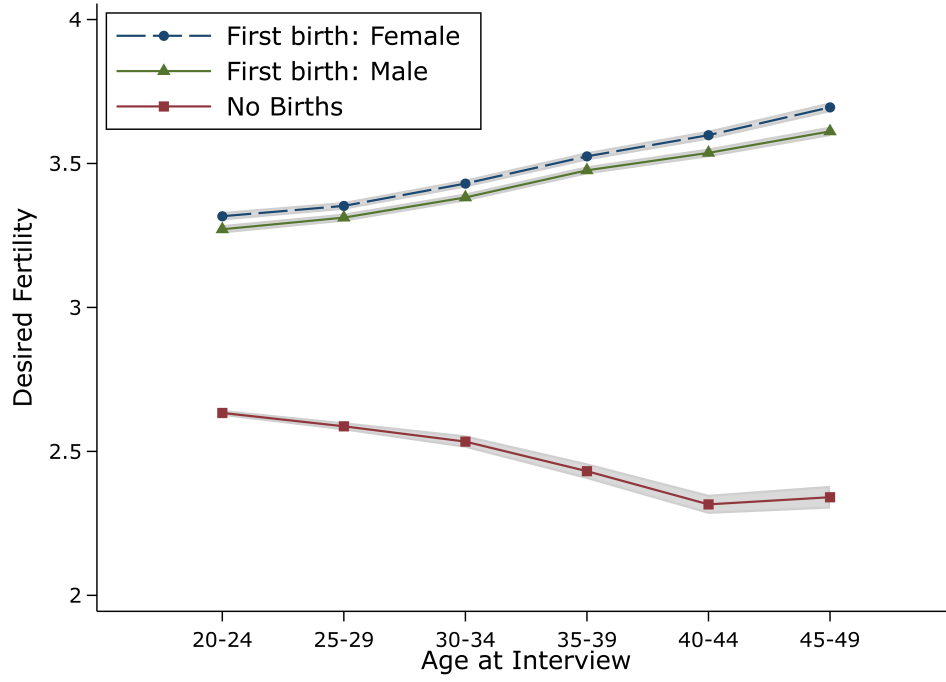
I would also include further analysis to show that respondents do not necessarily learn from the excess number of kids that they have had. Specifically, I will analyse heterogeneity in results by the time of first birth. The idea is to be verify if women who were interviewed shortly after their first birth also have a difference in desired fertility.

References

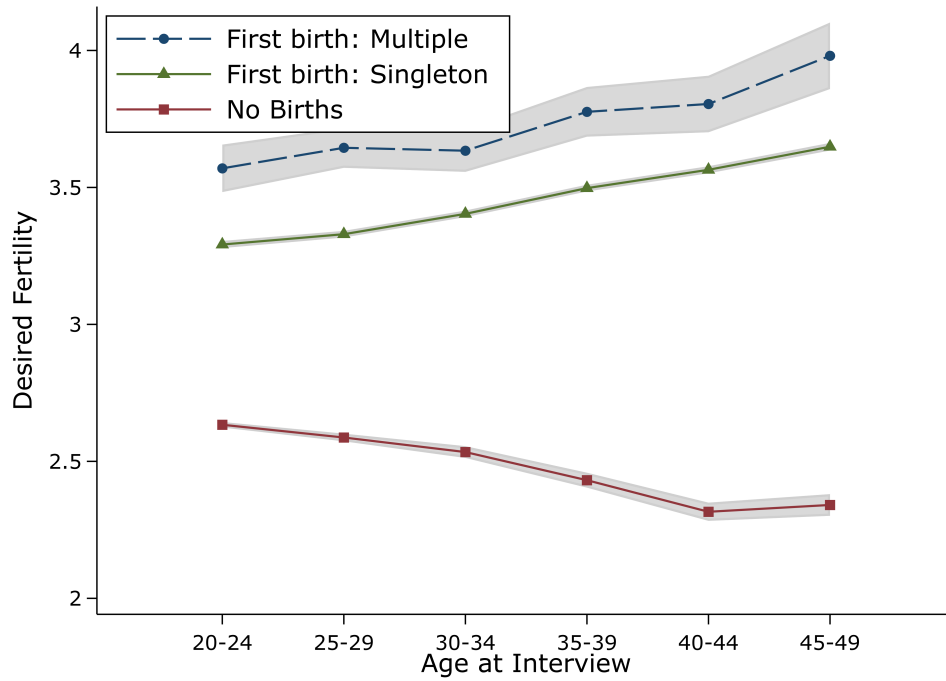
Bongaarts, John, “Completing the Fertility Transition in the Developing World: The Role of Educational Differences and Fertility Preferences,” *Population Studies*, November 2003, 57 (3), 321–335.

Figure 1: Desired fertility is different by the type of first births

(a) Female v/s Male



(b) Twins v/s Singleton



Notes: The figures show the average reported desired fertility by women in different age groups at the time of interview and with the respective type of first birth (or no birth). The shaded region indicates 95% confidence intervals computed using clustered standard errors.

Table 1: Effect of Nature of First Birth on Fertility

	Fertility at the time of survey		
	(1)	(2)	(3)
First birth were twins	0.664*** (0.013)		0.685*** (0.013)
First birth was female		0.127*** (0.002)	0.131*** (0.002)
<i>N</i>	3,371,836	3,371,836	3,371,836

Notes: All regressions control for age, education level, rural residence and country by survey round fixed effects. Standard errors shown in parentheses are clustered at the level of primary sampling unit. ***p<0.01, **p<0.05, *p<0.10.

Table 2: Main Results: Effect of Realized Fertility on Desired Fertility

	OLS	Reduced Form		2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Realized Fertility	0.267*** (0.001)			0.147*** (0.020)	0.296*** (0.016)	0.230*** (0.012)
<i>Instruments:</i>						
First birth were twins		0.098*** (0.014)		X		X
First birth was female			0.038*** (0.002)		X	X
<i>N</i>	3,371,836	3,371,836	3,371,836	3,371,836	3,371,836	3,371,836

Notes: All regressions control for age, education level, rural residence and country by survey round fixed effects. Standard errors shown in parentheses are clustered at the level of primary sampling unit. ***p<0.01, **p<0.05, *p<0.10.