Title: The effects of financial incentives for newborns in Korea

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Background

Although Korea has successfully experienced a demographic transition and has benefited from the demographic dividend while an emerging economy (Bloom, Canning and Sevilla 2003), its super-low fertility (1.08 in 2005) has become a serious public issue in Korea since the 1990s. In order to encourage couples to have more children, district-level governments have begun providing their own financial incentive program to couples who meet three criteria as beneficiaries (i.e. the parents have at least one-year of residency in the district from which they seek the benefits of the program; the parents have registered the newborn's birth with the district government in which they reside; the child lives in a district while receiving the benefits). Hereafter, we denote these financial incentives for newborns as 'FIN'. District governments are motivated to provide the FIN because of the rule that allocates budget subsidies from the central government to district governments based on the population size living under the jurisdiction of each district government.

Policy Intervention

All births in Korea must be registered with a district government to obtain citizenship (and its benefits). When a birth is registered, parents receive the information on the FIN of their district. A district set the amount of the FIN conditional on the birth order of the newborn child – with the amount generally greater for higher order newborns. The amount by birth order and the payment frequency (lump sum or recurrent payments) of the FIN vary by district. In this paper we are concerned with the total amount of the FIN (by birth order) provided by the district.

Objective

Past studies have claimed that the FIN does not lead to a significant increase in district-level total fertility rate (Huh and Lee 2011; Suk 2011). However, the effect of the FIN on the decision to have additional children among couples who have already at least one child has not previously been studied. Hence the objective of this study is to assess whether the FIN influences the household decision to have an additional child among parents who have at least one child.

Hypothesis

We assume that the impact of the FIN will vary by the birth-order and the FIN amount. Thus, our hypothesis is that the effect of the FIN for higher-order birth (e.g. 2rd or higher) newborns will differ significantly from that for lower-order birth (e.g. 1st) newborns, because the FIN amount is generally higher for higher-order births.

Data

Four datasets were used for this study. First, we collected comprehensive information on the FIN amounts by birth order between 2003 and 2009 from program managers of each district

government. Next, we used birth registry data over 1999-2009 produced by Statistics Korea, a national government agency. The third set of data are 1999-2009 district-level resident (population) registration statistics. The fourth dataset are 2005 Census data which we used to obtain district-level characteristics as control variables.

Methods

We used panel time-series analysis in order to assess the causal impact of the FIN. The main outcome variables are the district-level birth rate per 1,000 women aged 15-49. Moreover, crude birth rates of 2nd-order and 3rd-order births (i.e. birth-order specific crude birth rates) were analyzed separately. In order to examine the effect of the FIN for higher order (i.e. 2nd or higher) birth newborns, we used the financial amount of the district-level FIN for each birth order in addition to a binary variable of having any FIN. Our models include birth-order fixed effects and year fixed effects, and the standard errors are clustered at the district level in all analyses.

Results

Of the 248 local governments, 125 local governments provide the FIN ranging from 50,000 (about 50 US dollars) to 13 million Korean Won (US$13,000) in 2006. To date there are 123 local governments (of 248 total) that do not provide any financial incentives. The total amount of the FIN was much higher for higher-order births compared to the incentive for lower-birth births, ranging from a 2-fold to a 26-fold differential

We find that any FIN was effective in encouraging the parents to have a second- or higher-born and does not encourage those to have a firstborn (Table 1). Having any FIN increases the crude rate of 2nd-order births by 2.92% ($p<0.01$) and 3rd-order births by 8.45% ($p<0.01$). Having any FIN does not have a significant effect on having a firstborn.

Table 2 presents our main findings on the levels of FIN and fertility outcomes. The results indicate that a FIN of one million Korean Won (US$887) is significantly associated with a 3.0% ($p<0.01$) increase in crude rate of second or higher order births, and is also associated with 2.3% ($p<0.01$) increase in crude rate of third or higher order births.

Table 1. Effect of having any FIN on district-level fertility

Fertility Outcomes	Has Any FIN	Constant	R^2
Ln Crude birth rate (per 1000 population)	0.0154**	1.768**	0.809
	[0.00441]	[0.00474]	
Ln Crude rate of first-order births (per 1000 population)	-0.0110	1.044**	0.658
	[0.00606]	[0.00590]	
Ln Crude rate of 2nd or higher order births (per 1000 population)	0.0292**	1.095**	0.824
	[0.00451]	[0.00541]	
Ln Crude rate of 3rd or higher order births (per 1000 population)	0.0845**	-0.425**	0.665
	[0.00675]	[0.00675]	
Proportion higher order births of total births	0.00829**	0.512**	0.370
	[0.00150]	[0.00150]	

Notes: N = 2,396. Each row refers to a separate fixed effects regression with a different fertility outcome. Standard errors in brackets are clustered at district level. All fixed effects regressions include year fixed effects. * significant at 5%; ** significant at 1%.

Table 2. Effect of FIN on district-level fertility

Dependent variable	Crude birth rate for 1st-order births among all women	Crude birth rate for 1st-order births among all women	Crude birth rate for 2nd-order births among all women	Crude birth rate for 3rd-order births among all women	Crude birth rate for 2nd and higher-order births among all women	Crude birth rate for 2nd and higher-order births among all women	Crude birth rate for 2nd and higher-order births among all women	Crude birth rate for 3rd and higher-order births among all women	Crude birth rate for 3rd and higher-order births among all women
	all_1_*	all_1_1	all_2_2	all_3_3	all_ii_*	all_ii_2	all_ii_23	all_iii_*	all_iii_3
FIN for 1st-order birth	0.00058	0.00069							
	[0.00039]	[0.00029]*							
FIN for 2nd-order birth	0.00024		0.00041		0.0003	0.00042	0.0003		
	[0.00023]		[0.00014]**		[0.00014]*	[0.00011]**	[0.00014]*		
FIN for 3rd-order birth	0.00008			0.00026	0.00012		0.00007	0.00024	0.00023
	[0.00009]			[0.00006]**	[0.00008]		[0.00005]	[0.00009]**	[0.00006]**
FIN for 4th-order birth	-0.00017				-0.00013			-0.00009	
	[0.00014]				[0.00009]			[0.00008]	
FIN for 5th-order birth	0.00004				0.00008			0.00008	
	[0.00010]				[0.00005]			[0.00005]	
Constant	1.96506	1.96502	1.75455	0.36337	2.01625	2.01625	2.01624	0.49622	0.49621
	[0.00635]**	[0.00635]**	[0.00663]**	[0.00792]**	[0.00600]**	[0.00601]**	[0.00600]**	[0.00738]**	[0.00738]**
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
R^2	0.89	0.89	0.90	0.88	0.91	0.91	0.91	0.90	0.90

Notes: N = 2,453. Standard errors in brackets are clustered at district level. All fixed effects regressions include year fixed effects. * significant at 5%; ** significant at 1%.

Limitations

There are several limitations in this study. First, we only included documented live births excluding undocumented births and abortions among couples because used the data for birth registry. Second, the underlying assumption of this study is that all documented births in the

treated local governments received the benefits from the FIN. However, the implementation process might vary by the capacity of local governments and local governments often require parents to meet their own criteria to define the beneficiary of the FIN. In addition, in case of the FIN using long-term payment method, children whose families move to another district may not necessarily continue to receive payments after moving.

Conclusion

This study suggests that the financial incentives were effective in encouraging parents to have a second or more child. The major finding of this study implies that the FIN program should be tailored to the parents who have different number of children in order to maximize the effect of the financial incentives.

References

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