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journal homepage: www.elsevier.com/locate/jedcTwo birds with one stone: Female labor supply, fertility, and market childcare[☆]Jisoo Hwang^a, Seonyoung Park^{b,*}, Donggyun Shin^c^a Department of International Economics and Law, Hankuk University of Foreign Studies, 107 Imun-ro, Dongdaemun-gu, Seoul 02450, South Korea^b Department of Economics, Alfred Lerner College of Business & Economics, University of Delaware, 413 Purnell Hall, Newark, DE 19716, USA^c School of Economics and Finance, Victoria University of Wellington, 319 Rutherford House, Wellington, New Zealand

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ABSTRACT

The correlation between the female labor force participation rate (FPR) and the total fertility rate (TFR) has switched from negative to positive in some developed countries. In this paper, we show how increasing the substitutability between maternal time and market childcare can raise both FPR and TFR, and provide an explanation for the change in the TFR-FPR correlation. Simulations of a life-cycle model of married women's work and fertility decisions indicate that the FPR increases, whereas the TFR is U-shaped with regard to substitutability. The dynamic relationship depends on the relative strength of behavioral and composition effects: greater substitutability allows working women to have more children but it also attracts less productive women to enter the labor force, who trade child-births for labor supply. The findings imply that raising substitutability to a sufficiently high level can achieve the two seemingly conflicting goals—increasing female labor force participation and fertility rates.

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1. Introduction

Women in developed countries are more likely to work than ever before, but many still ask the old question of family or career once they have children. The difficulty of managing both drives some women out of the labor market or makes them less inclined to have children in the first place, manifesting the myth that “women can't have it all.” Rapidly aging population and slower economic growth mean this is a problem not only at the individual, but at the national level as well.

Recently, however, we observe cases in which the total fertility rate (TFR) and the female labor force participation rate (FPR) rise together. According to United Nations estimates in five-year intervals, the TFR in the US declined from 3.23 (1960–1965) to 1.77 (1975–1980) then rose back up to 1.88 (2010–2015). In Sweden, the TFR fell from 2.31 (1960–1965) to 1.64 (1980–1985) but increased thereafter to 1.90 (2010–2015).¹ Meanwhile, the FPR from the 1960s to 2010s increased from 42%

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¹ Source: United Nations World Population Prospects: The 2017 Revision.

to 67% in the US and from 55% to 80% in Sweden.² Similar trends are observed in France, Norway, Finland, and Denmark, where both TFR and FPR are higher than a few decades ago. Analogous trends are documented in cross-country data as well; the TFR-FPR correlation across OECD countries, which was about -0.5 during the 1970s, turns positive in the mid-1980s, and reaches 0.5 in the 1990s (see Fig. 1 in Ahn and Mira, 2002).

In this paper, we show how increasing the substitutability between maternal time and market childcare (henceforth substitutability) can serve as a “one stone” to raise both fertility and female labor supply, and provide an explanation for the change in the TFR-FPR correlation. We focus on within-country dynamics in order to draw policy implications controlling for other country-specific factors. We construct a life-cycle model of married couple’s labor supply and fertility decisions, then simulate how married women’s work (both intensive and extensive margins) and fertility (number and timing of childbirths) choices respond to different values of the substitutability parameter in the utility function. Results indicate that female labor supply increases, whereas total fertility is U-shaped with regard to substitutability. As market childcare becomes more substitutable with maternal time, the dynamic TFR-FPR correlation thus evolves from negative in the decreasing phase of the TFR to positive in the increasing phase of the TFR.

The nonlinear relationships among the TFR, the FPR, and substitutability can be explained by a combination of behavioral and composition effects. For working women, an increase in substitutability gives incentive to supply more hours in the labor market, raise per-child expenditure on market childcare, and have more children (“behavioral effects”). Enhanced substitutability, however, attracts additional women from the non-market sector as well—those who are lower-wage and less productive, compared to the existing pool of working women (“composition effects”). While higher substitutability allows this group to supply more labor on both the extensive and intensive margins, they trade childbirths for labor supply.

Because the relative size of the behavioral effects grows with the size of the female labor force, and because the current female employment level increases with substitutability, composition effects dominate behavioral effects at low levels of substitutability. Only a small portion of productive women are working, and hence the number of increased births among them is smaller than the number of reduced births among less productive women entering the labor market. As the degree of childcare substitutability exceeds some threshold level, however, behavioral effects of working women begin to dominate composition effects, and hence the TFR increases with substitutability. It is noteworthy that composition effects also imply that changes in substitutability affect not only the total number but also the distribution of children across households: at all phases, “new” births are concentrated among relatively more productive women.

To estimate the parameters of the model, we use observed profiles of the 1960s cohort in South Korea. Korea is a particularly interesting case to study for this purpose because it is known to have one of the lowest fertility rates in the world (with TFR of 1.17 children per woman in 2016) as well as low female labor force participation rate among OECD countries (52.1% in 2016).³ Like many other developed countries experiencing slow economic growth and rapid population aging, the government is desperately seeking ways to enhance fertility and female labor force participation rates.⁴ Thus, demonstrating how childcare substitutability could achieve both goals within this sample is meaningful from a policy standpoint. We primarily focus on the 1960s cohort because it is the most recent cohort that completed the fertile stages of the life-cycle, but we find similar results for other samples as well (e.g., 1970s cohort in Korea and various cohorts in the US).

The paper builds on the literature documenting the correlation between the TFR and the FPR. The switch in sign of this correlation from negative to positive across developed countries has been noted by Ahn and Mira (2002) and Rindfuss et al. (2003).⁵ Several variables have been suggested as potential determinants of the transition: the degree of “role incompatibility” between work and family (Rindfuss and Brewster, 1996), labor market arrangements such as unemployment rates and stability of contracts (Adsera, 2004), the relative wage of skilled labor (Galor and Weil, 1996; Martínez and Iza, 2004), taxation and the system of child support (Apps and Rees, 2004), women’s status in the workforce and in the household (Feyrer et al., 2008), cultural attitude towards working mothers or external childcare (Borck, 2014), and improvements in maternal health (Albanesi and Olivetti, 2016).⁶

Because we focus on childcare, our findings also complement studies on the effects of family policies on fertility and female labor supply. There are two branches within this literature. The first are papers that employ structural estimation methods: for instance, Attanasio et al. (2008) find that most of the increase in labor supply of mothers in the US between the 1940s and the 1950s cohorts is accounted for by a combination of a reduction in the cost of children and the gender wage gap. Haan and Wrohlich (2011) and Bick (2015) use dynamic models to test the effects of a subsidized childcare reform in Germany, and find positive effects on maternal employment but not on fertility rates. The second branch includes papers that use difference-in-differences strategy, exploiting quasi-experimental policy changes such as the introduction of universal

² Source: OECD data, 2017.

³ Source: Korean Statistical Information Service (hereafter KOSIS).

⁴ In addition to paid parental leave, the Korean government introduced subsidized childcare to all households with children ages 0–2 in 2012, and expanded the program to all households with children ages 0–5 in 2013. The usage rate of paternity leave is still very low, however, at only 4.5% of all male employees in 2014 (source: Ministry of Employment and Labor). The sustainability of the childcare subsidy program also remains controversial due to high costs.

⁵ Kögel (2004) and Engelhardt et al. (2004) argue that the sign reversal in the TFR-FPR correlation among OECD countries can no longer be observed when alternative econometric specifications are used, such as country fixed effects or cointegration techniques. They also acknowledge, however, that the negative correlation has indeed become much weaker over time (albeit not positive) and that endogeneity problems remain in their analyses because the TFR and the FPR are simultaneously determined.

⁶ Chang et al. (2014) address similar issues in the Korean labor market.

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