

Examining The Causes, Consequences, And Policy Responses to Low Fertility Rates in Advanced Economies

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Abstract. Alongside greater living standards have come persistently falling fertility rates, and now perhaps the greatest challenges are emerging demographic and economic imbalances. This paper will consider the multifaceted causes, consequences, and policy responses of low fertility, particularly in the Organization for Economic Co-operation and Development (OECD) context. Attention will be drawn to economic factors, such as the motherhood wage gap, increasing costs of raising a child, and also opportunity costs, which discourage families (and particularly women in professional occupations) from increasing the size of their family. The study has also considered wider social and cultural dimensions, which include changing gender relations and issues relating to the juggling of career and family life that have been more problematic for women to reconcile. Declines in fertility have great economic implications because they result in an older population with smaller workforces and increased dependency ratios. This puts a lot of pressure on pension systems and healthcare services. The paper concludes by revisiting some of the traditional policy responses, such as pro-natalist policies, parental leave, and subsidized childcare, and also considers revolutionary solutions like artificial womb technology. In conclusion, this paper contends that the rectification of low fertility demands pro-active, far-sighted policy measures in which economic incentives are married to cultural change, gender-equality initiatives, and technological advance. With such multi-faceted strategies in place, governments will be able to reduce—if not totally eliminate—the risks emanating from demographic decline, ensuring long-term sustainability of social welfare systems and economic growth.

Keywords: Low Fertility Rates; Motherhood Wage Gap; Aging Population; Pro-natalist Policies; Dependency Ratio.

1. Introduction

Among developed economies, fertility rates have for some time been on a steady decline and have actually been running lower than the replacement level of 2.1 children per woman. Among these developed countries are Japan, South Korea, Germany, and Italy, where fertility rates stand much below the replacement level. According to the Federal Reserve Economic Data (FRED) database, total fertility rates for OECD countries fell from 1.668 in 2018 to 1.558 in 2022 [1]. This decline results in population contractions, labor forces that are caught in a demographic vice, and increasing pressures placed upon social welfare systems.

In history, low fertility has been associated with high incomes, increased female working labor force, and more years of schooling for women. Economic theory by Gary Becker proposed that as families got richer, they tended to bear fewer children because they wanted to invest more in each child [2]. That used to be true in the past; however, new trends indicated that this traditional perspective was no longer entirely adequate to explain contemporary fertility behavior. Now involved are much more complex considerations, such as a motherhood wage penalty, increasing costs of childcare, changing cultural shifts in the norms, and updated increases in the opportunity costs of rearing a child [3].

The implications of low fertility are enormous because as the older population and declining workforce decelerate economic growth, such slow growth leads to lowered productivity and hence have some more effects, particularly on aspects of the pension and health care systems. This has led to an increased dependency ratio, with non-working people having a higher share of this ratio, thus resulting in more pronounced increases in the taxes and threatening the fabric of social safety nets.

This paper reviews the causes, effects and policy responses to falling fertility in the advanced economies, focusing in particular on such economic and social pressures as the motherhood wage gap, increasing cost of child-rearing and burden of an aging population. It also assesses policy responses, from traditional natalist measures to newer alternatives like artificial womb technology, that can help alleviate some of the problems lower fertility rates create.

Low fertility reflects a very wide range of influences, shaped by economic incentives and also other societal and cultural changes that support families and allow women to combine a career with having children.

2. Literature Review

2.1. Theories of Fertility Decline

Less economic being the theory underlying the "quantity-quality tradeoff" (QQT) by Becker holds that higher incomes lead parents to have fewer children but to invest more in those they do have education and wellbeing [4]. This model has been widely used in explaining fertility declines in advanced economies. According to critics the model overlooks cultural shifts for example changing gender roles and a rise in dual-career families.

The demographic transition theory postulates that, with economic development, fertility declines because falling birth rates are typically accompanied by economic growth, better healthcare, and education. According to Ichimura, this theory does not explain why high fertility in countries like Japan or Italy suddenly drops to very low levels but rather low and little by little [5].

2.2. Motherhood Wage Gap and Female Labor Participation

The motherhood wage gap would arise from the wages earned by the additional women's children in countries where labor force participation of women is high. For instance, Felfe found that German women face wage losses of up to 24.3 percent after giving birth [6]. This sort of wage differentials increases the opportunity costs of childbearing; hence, it deters many women from bearing more children, especially in professional careers.

The connection between female labor force participation and fertility is intricate. Countries with well-developed family policies, like Sweden—where parental leaves are generous and childcare is heavily subsidized—can keep fertility rates relatively high even with considerable female labor force participation. Meanwhile, countries such as Japan and South Korea have far fewer family supports and still have very low fertility rates, even as female labor force participation rises [7].

2.3. Economic Costs and the QQT

The burdens involved in child-rearing, especially with education, healthcare, and childcare, are among the reasons for having smaller families. For example, it is a known fact that United States Department of Agriculture (USDA) has claimed that bringing up a single child in the USA until the age of 17 costs more than \$230,000 without counting higher education [8]. This financial strain forced families to give more to their fewer offspring.

Economic barriers also prevent low-income families from having children. They also constitute limited access to cheap childcare and education, which particularly widens the fertility differential between rich and low-income families [9].

3. Motherhood Wage Gap

3.1. The Economic Burden of the Motherhood Wage Gap

The motherhood wage gap is the penalty on women's wages for having children because of such factors as time away from work, shorter hours, or discrimination. This wage gap is particularly pronounced in advanced economies where women's educational attainment and labor force

participation are usually high. For instance, in Germany, a wage drop for women reaches up to 24.3 percent when they change the employer after the childbirth event [6].

The economic consequences are large. Indeed, women who experience wage penalties tend not to have more children because of the financial risks involved, especially professional women for whom the opportunity cost of childbearing is quite high. In countries with weak family policies, like the United States, where there is no provision of paid leave and affordable childcare is scarce, balancing career and family life is—and exacerbates the motherhood wage gap.

In Germany, Japan, and South Korea, the wage structure gapes cause childbearing to be postponed or not to occur among well-educated women. Added to high childcare costs, this provides an incredibly strong disincentive for women to have large families, further reducing fertility.

3.2. Impact of Workplace Policies on the Motherhood Wage Gap

Supportive policies at the workplace can reduce this pay gap related to motherhood and also raise fertility rates. Countries with generous parental leave, flexible working hours, and subsidized childcare tend to have the lowest wage penalties for mothers. For example, in Sweden where shared parental leave is a norm and childcare is affordably priced has fertility rates going towards the replacement rate [10].

On the contrary, in Japan and South Korea—countries with far weaker family policies—total fertility has remained low, even as pronatalist interventions were more recently designed to raise childbirth. The very limited support for working mothers in these countries and the encouragement of motherhood wage gap perpetuate with very traditional gender regulations, dissuading women from the further children.

3.3. Cultural Factors and Gender Norms

The gender gap in wages related to motherhood is also highly structured by cultural prescriptions. Most women in many advanced economies are still the ones expected to carry the bulk of non-market work, even when their partners are working. Since this is the case, it translates into less working hours or a break in careers for women, therefore expanding the wage gap.

In Japan and South Korea, fertility decisions continue to reflect traditional gender expectations where the bulk of the burden of childbearing and childrearing falls on women who are expected to leave the labor market after having children [5]. Even when there have been policies to improve female workforce participation, women are, for the most part, still culturally pushed away from combining career and motherhood.

4. Quantity and Quality Trade-offs

4.1. Gary Becker's Theory of Fertility

Gary Becker formulated the theory of the QQT, where with higher income of families, there is a tendency of having a smaller number of children but greater investment in raising each child [11]. The trade-off takes place because richer families have more resources and can thus realize the potential of fewer children, rather than good money being thrown after bad on a larger number. The increasing tendency for children to be perceived as consumption rather than investment goods has strongly risen in fertility decline among the high-income economies.

4.2. Rising Costs of Child-Rearing

The costs of childrearing play to the QQT in advanced economies. For instance, the average cost of raising one child in the United States has exceeded \$230,000 as of the most recent count, excluding higher education costs. In many countries, such as South Korea, where many families invest a lot in education for the sake of ensuring their children's success, they end up having fewer children. Rising childcare costs have the same effect on leading families to have fewer children as it deters them from

developing more children because the availability of affordable childcare is rather limited in many advanced economies.

4.3. Opportunity Costs and Fertility Decisions

The opportunity costs of childbearing, especially by women-professionals, further lower fertility rates. This is because when women take time off for childbearing, they usually face huge career penalties. Especially in countries with weak family-support policies (like Japan and South Korea), such opportunity costs are particularly high for many women who thus choose to postpone childbearing or not have children at all.

4.4. Income Inequality and Fertility Gaps

Income inequality also largely creates differences in fertility decisions. Richer families can cushion more investments in their children, but poorer families find it hard to meet even the direct costs of raising a child. This is fertility gap—high-income families have fewer children, mostly of a high investment nature, while low-income families might defer or forgo having children for lack of finances.

5. Reduction in Productivity

5.1. Aging Population and Economic Growth

One of the most important results of falling fertility is the population aging, which has many implications for economic productivity and growth. As fertility rates decline and life expectancy grows, more old people emerge; meanwhile, the working-age population is getting smaller, indicating less economic output.

This has been demonstrated to imply that a 10% rise in the population over 60 corresponds with a 5.5% decrease in GDP per capita [12]. For example, the slow GDP growth and increasing fiscal burden on social welfare systems that result from the demographic aging of their populations in Japan, Italy, and Germany.

5.2. Labor Market Implications

This is accompanied by labor shortage in key sectors, especially those which used to depend on younger, physically able workers like manufacturing and health care. Labour shortage has the greatest impact in Japan's health care sector for instance, which is evident in the study conducted by Ichimura [5].

The shortage of labor forces firms to increase wages to entice workers, thus raising costs of production and reducing competitiveness in the global market. Another problem is that older people do not grasp new technologies so easily, thereby reducing productivity even more.

5.3. Modigliani's Life Cycle Hypothesis

The implications of the aging population are also revealed through Modigliani's life-cycle hypothesis, as people save more in their working years and dissave less in retirement. As the share of the elderly in the population rises, aggregate consumption tends to fall, which is a source of weakened demand and economic slowdown [13]. Thereby, resources move away from investment in innovation towards healthcare and pensions long-run productivity growth.

5.4. The Dependency Ratio and Fiscal Burden

In advanced economies, this ratio-level dependency ratio-has, until recently, been on a rising trend. For instance, Italy's old-age dependency ratio is projected to reach 60% by 2050 [14]. This place increasing pressure on pensions and healthcare systems, and in turn on public finances.

A declining working-age population may compel governments to raise taxes. But this too would dampen consumption and hence further slow economic growth. Rising fiscal burden over younger generations also raises doubt over the long-term sustainability of social welfare systems.

6. Dependency Ratio

6.1. Understanding the Dependency Ratio

The dependency ratio is a measure to indicate the relationship of dependent persons, including children and retirees, to the working-age population. If the dependency ratio is high, it means a greater portion of the population is dependent on the working-age group for economic maintenance, through taxation and social welfare systems.

With falling fertility rates and increasing life expectancy, old age dependency ratio has sharply risen in many advanced economies. For instance, in Japan, it had reached 48% by 2020 [15]. This is expected to continue as the population continues to age, and fertility rates remain below the replacement level.

6.2. Fiscal Pressure on Social Welfare Systems

The increasing old-age dependency ratio burdens significant fiscal pressure on the governments. Correspondingly, the more the retirees grow in number, public spending on pensions and healthcare grows as well. Temsumrit discovered that for every 1% growth in this ratio, government expenditure on social protection increases by 1.626% [16].

In countries such as Germany and Italy, with rising life expectancy and a declining working-age population, there is an increasing financial strain on pension systems. These were originally designed to be less adequate because they were shorter-lived systems. Such pension systems are increasingly untenable.

6.3. Impact on Younger Generations

The increasing dependency ratio burdens the younger generation ‘financially through higher taxes and lower disposable income. For instance, in Italy and Japan, where the labor force is relatively younger, there is an increased wave of retirees that would have to be supported, plus increasing costs of living with wages stagnating. This imposes a “double burden” on them as they have to support their families and support the social welfare system as well.

6.4. The Double Challenge of Low Fertility and Aging Populations

In most advanced economies, a twofold problem exists—in low fertility rates and aging populations. For instance, South Korea and Japan are currently facing the time bomb at the demography level, where reduced working-age populations and vast growths in the elderly are intensifying pressure on social welfare systems. By 2050, for example, the old-age dependency ratio in South Korea is projected to more than double [17].

7. Policy Suggestions

7.1. Pro-natalist Policies

A common response to falling fertility rates is the implementation of pro-natalist policies that offer financial incentives and subsidies to induce more births. Such policies tend to decrease what could be called the opportunity costs of bearing and rearing children, especially for women.

For example, in France, fertility rates have been kept at a relatively higher level (1.8 children per woman) in the presence of child allowances, tax deductions, and subsidized childcare. The same situation exists with Hungary: aggressive policies entailing cash grants and housing subsidies led to a temporary upturn in fertility rates. Still, financial incentives may not do much to chalk up a rebound

in fertility rates since the underlying institutional, societal, and cultural conditions leading to the effectiveness of family planning are beyond these incentives.

Sweden and Norway are frequent examples of success, owing to the generosity of their parental leave and subsidized childcare policies. In Sweden, for example, parents are entitled to 480 fully paid days of parental leave, shareable between the two parents, a setup much more likely to give additional equity by enabling mothers to return to work and not give up on career progress.

In countries such as Japan and South Korea, where affordable childcare is sparse, fertility rates remain low even despite parental-leave policies (very lax cultural expectations around gender roles to help discourage women from conflicting career/family lifestyle).

7.2. Work-Life Balance and Gender Equality Policies

One of the major impediments to higher fertility is the fact that more and more women find it difficult to combine childbearing with a career of their own. Those countries which ease working conditions and at the same time apply gender equality policies enjoy more positive fertility outcomes.

Countries like Denmark and Netherlands adopt work flexibility for the balance between work and family by allowing remote work, and flexible hours, especially for mothers. This helps reduce the wage gap and fertility rates.

The fertility level is higher in countries with gender equality, such as in Iceland since it has managed to create a supportive environment for families by instituting policies of shared parental leave and very strong legal protections against gender discrimination.

7.3. Artificial Womb Technology: A Revolutionary Solution?

Artificial womb technology is one answer that, when fully developed, is likely to cause social issues of reproduction to be solved datically [18]. This technology can replicate conditions in the natural womb, able to let a foetus grow outside of women, hence eliminating part of the strains of pregnancy and all its biological ramifications. Artificial womb technology can widen the scope of reproductive choices by offering an alternative when conception cannot take place within a woman's body. It can also solve problems such as infertility and increase the rate of fertility by minimizing the opportunity cost of motherhood. On the other hand, however, many ethical, legal, and social issues must take place, which should take a considerable amount of time before launching this technology on a larger scale.

8. Conclusion

The low-fertility dilemma in advanced economies is a great, multidimensional challenge that has far-reaching implications for economic growth, social welfare systems, and demographic prospects. Underlying the reasons for low fertility are several deeply embedded economic, social, and cultural factors that cause the motherhood wage gap, increasing costs of child rearing, and increased opportunity costs. At the same time, such outcomes further risk long-run sustainability of both welfare systems and economic growth-the demographic time bomb and the rising dependency ratio.

The motherhood wage gap and the quantity-quality trade-off both depopulate larger families as parents place a higher investment in fewer children. Working women pay high opportunity costs, especially in such countries as Japan and South Korea, where cumbersome work cultures and scant family-support measures beget impediments to higher fertility rates. The demographic shift is straining welfare states all over the world.

Low fertility also has other economic consequences. It reduces the working-age population, thus slowing economic growth and increasing the fiscal burden on younger people. That is, as the dependency ratio rises, more government resources are funneled to support the elderly, and fewer funds are available to make critical investments in education, infrastructure, and innovation.

Low fertility rates reflect an intricate problem in public policy as financial incentives and parental leave, among a range of other pronatalist policies, have proven insufficient to reflect real

improvement. A larger concept of work-life balance policies along with a change in culture is more probable to be effective. One other area of hope where the burdens, both physical and economic, can be greatly lifted is by artificial womb technology, though it raises numerous challenging ethical and legal issues before it can ever be utilized.

The declining fertility problem can be solved only by a comprehensive approach to the economic and cultural aspects of the issue. Governments should introduce holistic family policies that relate to gender equality, affordable childcare, and flexible work arrangements. Also, the revision of pensions and healthcare is a burning need for the long-term sustainability of social welfare systems.

While formidable, the challenge of declining fertility need not be a deterrent. Governments, through a mix of traditional policy measures and new technologies, can create an enabling environment for families and ensure that long-term sustainability of their economies is achieved. As the fertility rate perpetually decreases, there is an infusion of increasing necessity in altering its causative factors and effects proactively accordingly.

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