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To What Extent Would Raising Low Birth in Developed Countries Affect the Economy

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Abstract: The focus of this article is on falling birthrates in developed nations, and it examines the underlying causes, consequences, and initiatives taken to address it. It covers a variety of topics, including political science, international relations, and other subjects in addition to economics and demographics. The effects of low fertility are discussed, along with how they affect household income, capital growth, and automation. Gender variations are also evaluated. The essay also discusses the U.S.-centered national policy and its effects on things like taxes and aging.Since the detriments outweigh the benefits, the policy needs to be implemented. The three policies (immigration, automation, and baby care) directly or implicitly increase fertility and thus social productivity, while generating a set of issues that need to be refined. In general, the aging situation and the population density of cities may be compromised by the implementation of the policies and produce multiplier effects. In general, rising fertility adds varied amounts of stress to each family. And somehow, by implementing childcare programs, strain on women will be substantially less and their productivity will rise to some level. In the long run, the government will also generate more fiscal revenue due to the increase in personal income tax, which boosts social welfare and raises government input. The effects are favorable for social productivity and employment rates. The senior population has improved security, and the pension shortfall is partially closed.

Keywords: Low fertility, Social productivity, Childcare programs, National policy, Qualitative analysis.

1. Introduction and Current Situation

In the twenty-first century, a number of governments have employed coercion to either boost or lower the birth rate, notably Singapore and England, realizing that this policy has long-term effects on the nation's macroeconomic and demographic makeup. Concerns now revolve on the global expansion of low fertility, which was long believed to be a problem that only affected Europe or affluent countries (Morgan & Taylor, 2006)[1] .According to Sacerdote & Feyrer (2008)[2] , the different fertility rates in high-income countries are also a result of the status of women in the workforce and in the home, and each component of the family policy package has had a significant impact on fertility trends (Luci-Greulich & Thevenon, 2013)[3] .

The objective of the thesis is to investigate ways to raise the low birth rate in wealthy nations. So, it delves into the key reasons why low fertility rates are more likely to occur in industrialized nations than in developing nations. Low fertility is frequently observed with shared regularities when examining the demographic makeup, and specific political and economic elements in both developing and industrialized nations. The dissertation also discusses policies intended to increase birth rates by examining some of the ones already in place and gathering and analyzing data to determine their effectiveness. Additionally, it must examine the data to determine if there is anything that suggests that the policies are effective or not, and it must back up those claims with data-based findings.

Adopting a progressive research approach, exploring the causes, consequences, and policies implemented for low fertility, the “mystery” is lifted step by step. This thesis is based on a generalization, integration, and refinement of previous research. The discussion of low fertility outcomes will be divided into several broad categories based on causes, and the solutions will take into account the strengths and weaknesses of previous policies and the impact of unused types of low fertility in order to launch a general conclusion.

It needs first to provide the background information regarding the demography such as birth rate and developed countries to understand the measurement of low fertility rate and developed country. Also some theoretical framework need to be explained unambiguously for readers to correctly understand the meaning in the text. And then describe the reasons for the relatively low birth rates in developed countries that have been described will then be discussed, as the consequences of low birth rates, which policies can be used to address the problem, and their pros and cons assessed. In the discussion section, the strengths and weaknesses of low fertility are focused on and divided into micro and macro perspectives, as well as long-term and short-term perspectives. Next, several policies such as immigration, automation, and deconcentration services are discussed and evaluated for their feasibility, and several subjective opinions and suggestions are presented. Finally, the impact of increased fertility on society after policy implementation is evaluated.

2. Research Review

2.1. Background Information

There are two key words which are birth rate and developed countries respectively that will be defined in the following paragraphs. The birth rate is usually the dominant factor in determining the rate of population growth. It depends on both the level of fertility and the age structure of the population. Understanding the definition of fertility and how it is meas-ured will make it easier to read more research articles on demography. The criteria for de-termining whether a country is developed or not defines what the difference between devel-oped and developing countries is, and provides further

insight into the subject matter to be studied in this article.

2.1.1. Birth Rate

The birth rate is the ratio between the number of live-born births in the year and the average total population of that year. According to the World Bank, two Main Methods of Measuring Fertility are Crude Birth Rate (CBR) and Total Fertility Rate (TFR).

Crude birth rate (CBR) is a common measure of human fertility. The crude birth rate of an area is the number of births actually occurring in that area in a given time period, divided by the population of the area as estimated at the middle of a particular year. It is obtained by dividing the number of births recorded in a population during a specified years by its total number. as shown in formula 1:

$$\mathrm{CBR} = \frac{\text{Total number of children born in a year}}{\text{Mid-year population x 1000}} \quad (1)$$

However, the CBR is only a rough estimate of fertility. It does not specify why birth rates are different in different years and between different populations at the same time.

The total fertility rate (TFR) is a more direct measure of the level of fertility than the crude birth rate, since it refers to births per woman. There are two general assumptions of using Total Fertility Rate, which are no death women before the end of the reproduction period and fertility rate by age is constant in a certain period. It is calculated by adding up the average number of births per woman across five-year age groups (i.e. age-specific fertility rates, or ASFR). The specific formula to calculate TFR is shown as formula 2:

$$\mathrm{TFR} = 5 \times \sum \mathrm{ASFR} = 5 \times \left(\frac{\text{number of birth to women aged 15–19}}{\text{number of women aged 15–19}} + \cdots + \frac{\text{number of births to women aged 35–44}}{\text{number of women aged 35–44}}\right) \quad (2)$$

While the TFR gives a good picture of current fertility rates of a place or a population, the TFR will not actually predict how many children a woman will have because it is an average; different things factor into this for different women – location, decisions to wait to have children (Carlson, 2014)[4].

2.1.2. Developed Country

A developed country is one that has reached a high level of economic development, as evidenced by its robust manufacturing and service industries, high gross national product, and high per capita income (Majaski, 2022)[5]. Some economists believe that a country is considered developed if its per capita GDP is between $12,000 and $15,000, while others believe that a nation is not considered developed until its per capita GDP is between $25,000 and $30,000. The developed nations, particularly the United States, will be taken into consideration in my dissertation because it has the largest database on birth rates and is regarded as a typical low birth-rate developed nation with a GDP of $65,111 per capita. Yet, there aren't many policies in place to address this issue (Majaski, 2022)[5] .

2.1.3. Birth Rate in Developed Countries

In order to determine whether a country's level of development and its fertility rate are related, this article examines the GDP per capita and fertility rates of Singapore and the UK, two typical developed nations. In 2021, there will be 2.438 births per woman in the world. Because a birth rate of 2 indicates that the population neither decreases nor increases, it serves as a reasonable cut-off point, and a fertility rate below 2.0 is therefore seen as being quite low.As shown in figure 1 and figure 2.

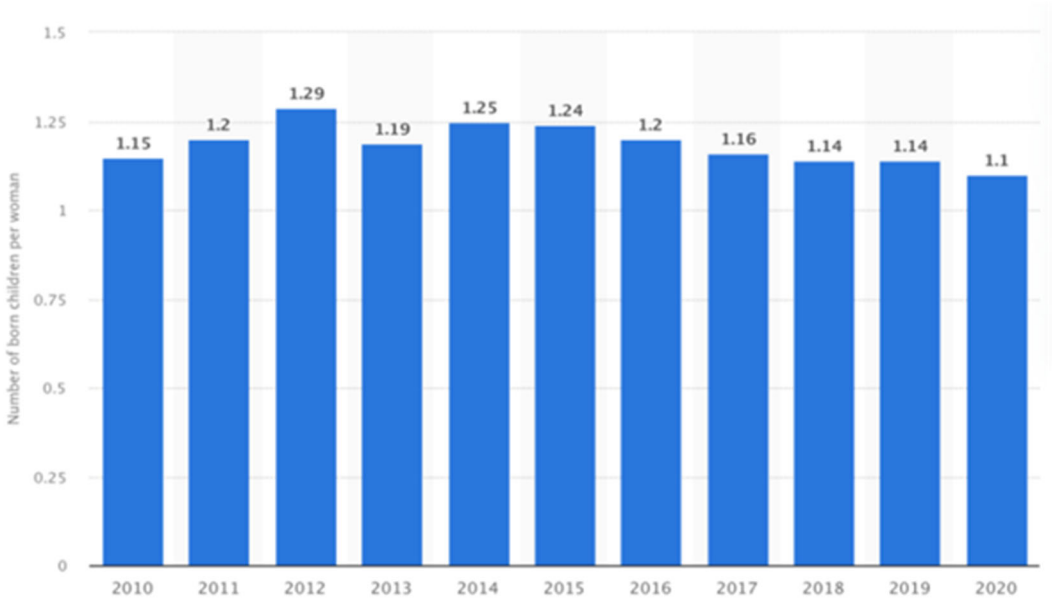

Figure 1. Singapore: Fertility rate form 2010 to 2020

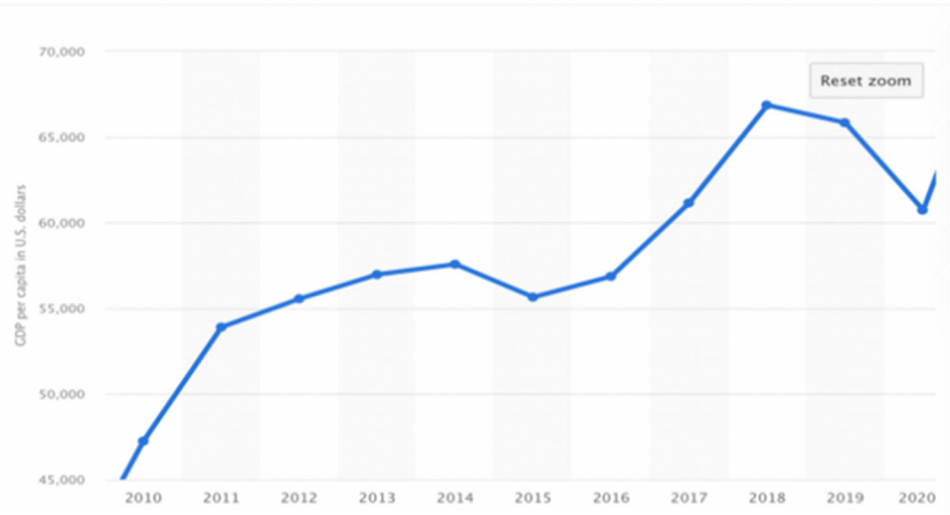

Figure 2. Singapore: GDP per capita in current prices form 2010 to 2020 (in U.S. dollars)

Comparing Figure 1 with Figure 2, Singapore's fertility rate shows a slow decline from 1.25 to 1.14 between 2010 and 2014, while its GDP per capita increased by about $10,000, indicating that a decline in population fertility does contribute a country more developed. Similarly, by comparing Figure 3 and Figure 4, the same conclusion is reached as after analyzing Singapore, that the standard of living of the British people became better in 2010-2014. Between 2014 and 2017, the falling TFR with declining GDP per capita islinked to some degree to the Brexit (the withdraw of the United Kindom from the European Nation) , as shown in figure 3 and figure 4:

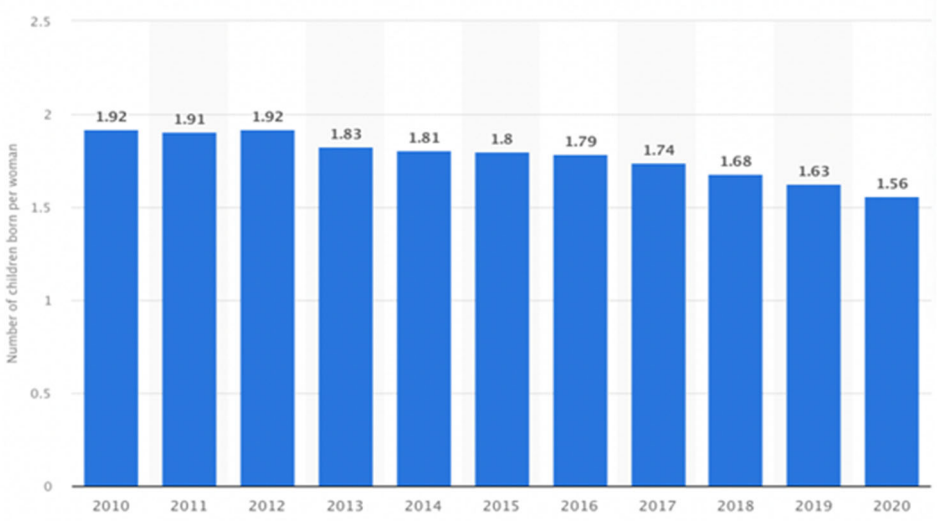

Figure 3. United Kingdom (UK): Fertility rate from 2010 to 2020

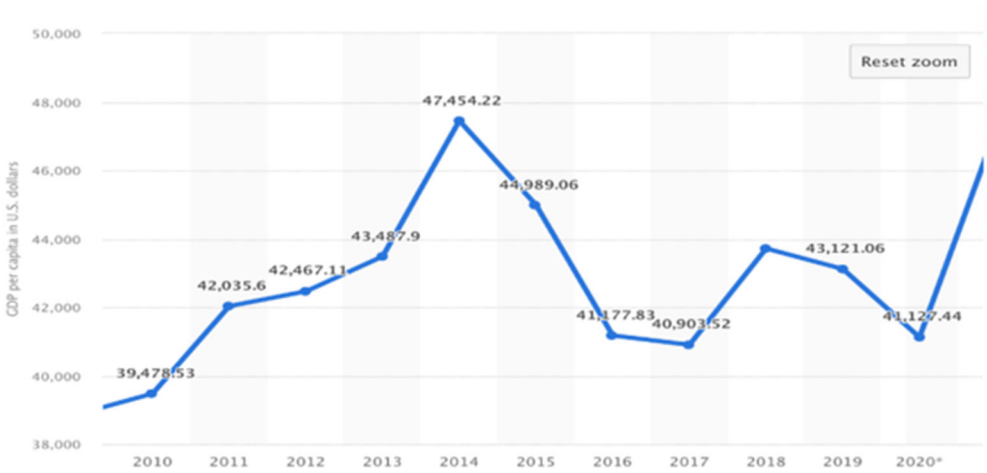

Figure 4. UK: GDP Per capita in current prices from 2010 to 2020 (in U.S dollars)

consumers faced rising prices due to the fall in the pound, while uncertainty over the future UK-EU relationship has hit business investment (Harari, 2020)[6]. In addition, outbreak of the epidemic from 2019 to 2020 is not given consideration for the global economic was in a recession, which will be explored further in the discussion. This is more of an introduction of the data and the discussion itself with proper answers will be in the discussion.

2.2. Theoretical Framework

The following paragraphs introduce several theories about second-order effect, population pyramid, and dependency ratio. Reviewing on these theories offers better understanding on the impacts of low fertility rate and implications after implementing policies and help formulae the research question, which will be answered in the further discussion.

2.2.1. Second-order Effect

Second-order effects every action has consequences, and those consequences have consequences called second-order effects. Think of a row of dominoes-a single push causes a chain of events to occur. Once the chain starts, it is difficult (if not impossible) to stop or reverse the cascade of cause and effect. In demography, in particular, the increase in the proportion of women with high educational attainment is also relevant in explaining the increase in participation. The changes in composition by marital status or fertility are second order effects (Amador et al., 2013)[7] .

2.2.2. Population Pyramid

A population pyramid is a graph that shows the distribution of ages across a population divided into centers for male and female members of the population. It is called a population pyramid because when a population is growing (more babies are being born than people are dying), the graphic forms the shape of a triangle. Population pyramids help show how populations are composed and how they are changing. As shown in figure 5.

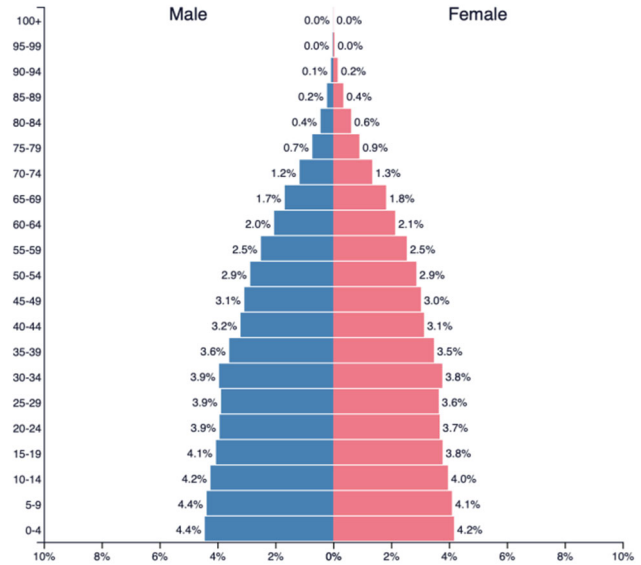

Figure 1. 2021 Generation Population Pyramid

2.2.3. Dependency Ratio

The dependency ratio allows for a comparison of the number of dependents by age in relation to the total population (Hayes, 2022)[8]. Specifically, it gauges the ratio of those aged 0 to 14 and 65+ compared to those aged 15 to 64. In so doing, it separates those who are able to work from those who are unable to work, which can indicate how the level of unemployment contributes to the economic burden. A low dependency ratio (below the U.S. ratio of 62.5) means that there are sufficient people working who can support the dependent population.

2.3. Reasons for Low Birth Rates in Developed Countries

The relationship between women and the market is believed to be a key element affecting the fertility rate. Alicia Adsera (2004)[9] has mentioned in an article that the flexibility of the market to accommodate women's exit and entry decisions, as well as the penalties imposed by particular market arrangements on truncated careers-through lost experience, delayed wage growth, and increased risk of unemployment-are key to explaining the decline. Sacerdote et al. (2008)[2] argues that the increasing status of women in the workforce and their place in the household, particularly in terms of child care and domestic production, has contributed to the decline in fertility across top-income countries. Morgan and Taylor (2006)[1] argue that in most contemporary contexts, parents incur significant direct and indirect costs in having and rearing children. Indirect costs are substantial and reflect primarily the mother's foregone earnings due to pregnancy, childbirth, and childrearing (DiPrete et al., 2003)[10]. High-prevalence births may be more disadvantageous to parents, siblings and society. Thus, we can conclude that robust family policies are necessary if governments are willing to increase the birth rate, a conclusion similar to the findings of Luci and Thévenon. They confirmed that each instrument of the family policy package (paid leave, childcare services, and financial transfers) has a positive influence on average, suggesting that the combination of these forms of support for working parents during their children's early years is likely to facilitate parents' choice to have children (2003)[3].

2.4. Consequence of Low Birth Rates

Because of the low fertility rate, which is becoming more and more widespread, population growth will be slowed down globally during the coming decades. Many economists have commented on the effects of reduced fertility as a result. When the birth rate declines, human capital grows, according to Li and Zhao's (2021)[11] analysis of the relationship between total-factor productivity (TFP) growth and breakdown at low birth rates. Low fertility is not a catastrophe of the twenty-first century—not yet, at least. It is the result of addressing a larger and more threatening social problem: the crisis of continued population growth. According to Krishman (1991)[12] , it showed that children ever born harm female labor force participation (FLFP) when socioeconomic and cultural variables are controlled for. Parallel to this, it is suggested in the article "The Expense of Low Fertility in Europe" that a decline in fertility rates will, in the near term, reduce the youth dependence ratio and raise the proportion of individuals who are working age, which will improve revenue per head. The article also discusses how the population pyramid's long-term impact will play a role in this. Over time, as more people of working age enter retirement, there will be fewer workers available to take their place. The conclusion is that whatever short-term advantages reduced youth dependency may have for European countries would ultimately be offset by the financial weight of old age

dependency (Bloom et al., 2009) [13].

2.5. Methods to Increase Birth Rate

Nargund and Gharibi have used some of the data from the survey to propose. Under 43 percent of the world's agricultural labor force of women globally risingto 70 percent in some countries that illustrates the contribution of women to the total workforce and social welfare agenda (tax and national insurance) is more than ever before and deserve to get reproductive benefits from the public purse (Gran, 2019)[14]. Nargund (2009)[15] has argued for the need for governments to provide adequate publicly funded reproductive health and social care to achieve the desired birth rates and younger populations to contribute to national and global progress. Except for the government's efforts, the amount of training and propaganda to increase the birth rate can be considered severely effective (Gharibi et al., 2020) [16]. This conclusion is based on 2016 data showing that 58% of participants did not use any reproductive health method, compared to only 9.2% in 2004. Other academics prefer to discuss policies already in place. Australia has offered support to families with children since the early 20th century. For example, a maternity allowance of £5 (over two weeks' wages for an unskilled worker) was introduced in 1912 (Daniels, 2009)[17]. Over the years, various benefit payment schemes have been introduced to help families with children. Nonetheless, the type and strength of support vary depending on which major party is in power (McDonald, 2015) . Singapore's experience with pro-marriage policies might be useful for other countries to look at. The government has also sought to promote marriage through housing policies that offer various inducements to Singaporeans who plan to marry.

2.6. Conclusion

The reason why the relatively low birth rates in developed countries exists is that fe-male labour participation (average age of mother), biological fertility (affected by age of parents), attitudes to children (survey data reliability), average income vs costs of raising children. And the consequence of a low birth rate is that it will slow population growth at the global level, with a tiny share of the working age population in the absence of large immi-gration inflows. To address this serious problem, the role of governments is as indispensable as their capacity to provide adequate public services and education. On top of this, the scholars evaluated the policies implemented in different countries, such as China and Australia, to a significant extent.

There is limited research on my topic policy on birth rate in USA, thus this paper intends to deal with the following research question 'to what extent would raising low birth rates in developed countries affect the economy?'

3. Discussion/ Development

3.1. Positive Impacts of Low Birth Rates

3.1.1. Enhance the quality of household lifestyle (Micro-level)

To begin with, the impact of the current low fertility rates on developed countries' development differs in the short and medium term. Discussed in the literature review, a fer-tility rate below 2.0 is considered relatively low so it is argued that households with one or two children in developed countries will largely improve the standard of living.

For a household, a low fertility rate implies that the family allocates more funds to personal finance rather than to the upbringing of their children, accompanied by a financial-ly superior revenue. Even when parents are similar in a variety of characteristics (e.g. educa-tion, income, race), they still provide more resources per child in small families than in large families (Downey, 1995)[18] . As a consequence, one-child families deliver improved educa-tional opportunities for their children, resulting in better quality education and reduced ex-penses, hence helping them achieve career goals, such as making more money, entering their current career or starting in another. Those with a master's degree can expect to earn double than that of a high school education (Carnevale et al., 2020)[19]. Thus, in the short run, chil-dren in low-fertility families are more apt to secure quality educational resources to pursue an advanced degree and possess a relatively successful life.

3.1.2. Positive Employment Impacts for Women (Micro-level)

Even if in the short term, the effects of low fertility on men and women are in part very dissimilar. Low fertility means that women are with more smooth careers without raising children. Pregnancy causes women to enter a period of disengagement from work, and returning to work can be intellectually and psychologically demanding (Maxwell et al., 2018)[20] . Furthermore, mothers struggle to leave their babies behind when rejoining work, which becomes less productive due to the distraction of the child. In addition, those who interrupt their careers may not be capable of performing the same position due to the time required to adjust to the previous pace of operation. If a female is not conceiving, she experiences fewer of those challenges, which leads to a smoother workplace. Meanwhile, men are still expected to be breadwinners, regardless of their education level or their spouse's employment status. So the low fertility outcome matters marginally for men, who approach breadwinning as an obligation. In conclusion, a low dependency ratio delivers an improvement in household finances and national productivity in the short run, while in the long run, a potential risk of a labor shortage is associated with a decline in national competitiveness. Moreover, a low dependency ratio has essentially neutral effects on men, while generating more social benefits for women. The incompatibility of employment and motherhood would seem to have become seriously weakened in recent decades, through the growth of part-time work and the increasing availability of institutionalized child care. From a feminist perspective, it may be argued that the incompatibility of work and motherhood is mainly a consequence of existing gender structures in society and the ensuing power relations within marriage. To the extent that it is childbearing and child-rearing that prevent a woman from being in the labour-force, and not marital status per se, not having children will of course contribute to the likelihood that a married woman will be working outside the home.

3.1.3. Accelerate the process of capital accumulation (Macro-level)

Focusing on one nation's economy as a whole, as fertility rates decline and the quality of education improves, the burden of education subsidies eases and more government spending can be channeled into critical industries. Also, technology in security and infrastructure tends to be somewhat more effective than in education, which means that policymakers ought to allocate more expenditure on health and infrastructure than education. Elites have a

disproportionate impact on development outcomes (Amsden et al., 2014)[21] . While a country's trajectory is shaped by the actions of elites, the cultivation of more quality talents also have a second-order effect, that is, promoting the country's progress to some extent fundamentally. Developed countries, with a relatively low fertility rate, are likely to enjoy a faster capital accumulation as well as economic growth.

3.1.4. Driving Productivity Transformation

The reduction in birth rates results in a surge in disposable income per capita, propelling the country to productivity transformation. According to the labor market theory, a vanishing demographic dividend means that the supply of labor decreases, which increases the wage rate of labor. As a result, industry uses more capital to produce goods, so capital becomes more dominant. To elaborate, Japan is an example that has successfully transited to a machine-led economy. With a shrinking workforce and a low female participation rate, Japan has had to rely on productivity as its primary catalyst for growth. Therefore, it accelerated the progress of technological innovation. Moreover, Japanese technological implementation has proven to make a statistically significant contribution to productivity improvements (Fukuda, 2020)[22] . About 40% of the total factor productivity (TFP) growth rate of 5.02% was due to increases in the quality of capital (Fukao et al., 2020)[23] .

3.2. Negative Impacts of Low Birth Rates

In the medium-term, low fertility rates not only exacerbate the tendency for an aging population which exerts significant strain on social security but also influence government revenue streams.

3.2.1. Demographic Pressure on the Elderly in the Medium Term

Taking the USA, a typical developed country as an example to illustrate those two arguments, by the year of 2050, the proportion of population aged 65 and above is projected to rise to an estimated 85.7 million by 2050, roughly 22% of the overall U.S. population, compared to 14.4 million in 2009, indicating a rapid growth in aging population (Mather et al., 2019)[24] . An aging population creates increasing pressure on Social Security and public health services. As older people and retirees begin to draw more from Social Security and contribute relatively little by 2020, the program's expenses will begin to exceed its revenues, which is also associated with the current decline in fertility rates. The government will be forced to fill the current gap with contributions from contemporary generations, yet the gap will continue to widen. According to current projections, Social Security will not have enough money to pay for promised by the mid-to-late 2030s (Huber, 2022)[25] .

3.2.2. Pressure on Government Revenues

In addition, low fertility is likely to affect several major revenue streams in the com-ing decades. Because women are having fewer children than women in previous years, even-tually there could be fewer workers paying income taxes. A paper published by the Federal Reserve Bank of Kansas City estimated that projected demographic changes would collec-tively reduce per capita state individual income tax revenue by 2.4% nationally, with the effects on future sales tax collections projected to be less severe (Chapman, 2022)[26] . But sales tax reductions as a consequence of reduced fertility still pose a long-term risk in states that rely heavily on sales taxes, which account for nearly half of states' total tax revenue. Trends in fertility will also influence property taxes, a major source of revenue for many school districts and local governments as smaller households to also lower the assessed val-ues of larger homes, reducing property tax revenue funding for education (Chapman, 2022)[26].

3.2.3. Rising Class Entrenchment and Inequality

Nevertheless, the deepening of capital will be accompanied by more people being unemployed and the concentration of prosperity in the possession of a few capitalists. With a widening disparity between wealth and poverty, the size of the middle class shrinks, creating a "solidified" structure among social classes. As long as working people are constrained by the income earned solely through the wages of laboring workers, they trailed behind by the continued draw of economic bounties to the top 1% from whom the system is rigged to prof-it. Laborers and the middle class will continue to stagnate, creating a stagnant consumer economy. In essence, the withdrawal of the demographic dividend has promoted a consoli-dation of the national capital and a transformation of the factors of production, simultane-ously accompanied by an intensification of the issue of social unemployment and inequality. As the need for labor decreases and the power and leverage of productive capital increases, the gap between labor workers and capital owners will increase, which will result in turmoil and upheaval, if not revolution.

3.3. Policies to Raise Low Birth Rates

Low fertility rates not only provide children with access to premium resources and allow more women to succeed in the workplace but also facilitate capital deepening and technological innovation. Yet it also carries some pitfalls in the medium term, such as the polarization of society and elderly population pressure. Therefore, the government will ad-just its policies to accommodate the low dependency ratio. The following section will focus on three policies, childcare policy, encouraging the inflow of foreigners, and automating production respectively.

3.3.1. Childcare Policy by Government

(1) Introduction to the Childcare Policy: The government can address declining fertility and negative population growth by adopting new population policies, especially with the Pre-school Childcare Policy. Even though women have more educational and labor market opportunities than ever, gender inequality at home, which places the burden of car-ing for children and household chores on women, results in very high opportunity costs of childbearing and hence very low fertility (McDonald, 2006)[27] . Hence, it is relatively easy for women to outsource childcare and housework if governments are heavily involved in the provision of low-cost and high-quality formal childcare. Empirical evidence shows that childcare provision is more likely to influence the fertility behavior of highly educated women, who are more active in the labor market. Henau (2022)[28] estimated that an increase in childcare coverage for children aged 0-2 from around 10 percent to 50 per cent in 15 ana-lyzed countries of the European Union would increase the completed family size of highly educated women from slightly above 1.4 to 1.9 births per woman. However, the provision of childcare is not the only aspect that is important to parents and parents-to-be in their deci-sion to have children. Other components of a "good childcare system" that may encourage births include the level of care provided, the cost, and the hours of operation. Only when it is clear that daycare will benefit their child (or at the very least not harm him or her) will par-ents choose to use

one. Providing high-quality care is essential for a child's development.

(2) Effect on Economy: A close connection occurs between child care and eco-nomic growth and development at the state and local levels. In addition, the child care in-dustry generates spillover effects (additional economic activity such as the purchase of commodities and services and the creation or support of employment in the community) be-yond the employees of child care or the business income of the operating center or family program. In North Carolina, child care services had quite a $3.15 billion dollars economic impact (direct income of $1.47 billion and indirect revenue of $1.67 billion from other in-dustries in the county and city). The total number of jobs created by child care programs in the state was 64,852, including 47,282 persons working in daycare centers or running home businesses and an additional 17,570 spillover jobs that were generated by the activities of running child care programs (Basloe, 2019) [29].

3.3.2. Immigration Policy

(1) Advantages of Immigration Policy: The ultimate objective of raising fertility is to improve social productivity, thus developed countries are allowed to adopt immigration policies to boost the labor force population, which is a sort of a double solution to the ageing problem so the effect on the economy would probably be quite large. Replacement migra-tion is the kind of international migration that a nation would require to counteract popula-tion aging and decline brought on by fertility rates below the replacement level. By lowering immigration restrictions and allowing foreign employees to enter the country, it may be pos-sible to counteract the decline in the working-age population. To emphasize, immigrants support the demographics of advanced economies because their fertility rate is higher than that of natives. In the United States, the total fertility rate of natives was 1.76 children per woman in 2017, whereas that of immigrants was 2.18. The presence of immigrants helps to keep U.S. fertility at levels closer to the replacement rate (Peri, 2020) [30] .

Moreover, the foreign population is important to the central and local governments because they possess skills, qualifications and foreign networks that are scarce. Immigration would also address to some extent the shortfall in pensions and government revenues men-tioned above. It is also increasingly difficult to maintain pay-as-you-go pension systems in these rapidly aging countries, which have gone from having 10 working people per retiree to only 3 or 4 in just a few decades (Peri, 2020) [30]. Immigration, especially in rapidly aging coun-tries, would help slow the growth of age dependency rates. While immigrants will eventual-ly age out, a large inflow of younger working-age people in the years of the worst native de-cline would allow for a gradual and more manageable transition. Similarly, a larger propor-tion of working-age immigrants may reduce the age dependency ratio (the number of people aged 65+ divided by the number of people aged 15 to 64), which is growing rapidly in de-veloped economies. In the United States, this rate has increased from 0.126 in 1950 to 0.260 in 2022 (Tradingeconomics, 2023) [31].

(2) Assessment&Improvement of Current Immigration Policies: Still, more im-migrants may deteriorate their economic integration, as more competition among such workers with comparable credentials will be intensified given that available resources de-rived from governments are restricted. It is no coincidence that immigration raises issues of cultural conflict and political strife, but for those who place less importance on children (Fokkema & Esveldt, 2008)[32] and favor a less traditional lifestyle (Sobotka & Testa, 2008)[2] of childlessness, immigration-focused population policies may be more acceptable than fer-tilityism as a solution to the problem of population aging. The government can introduce incentives for migrants to relocate to areas with a high population density of such individu-als. Moreover, the country should take into account the customs of different regions and en-courage more residents of nations with relatively high fertility indices to settle in developed countries. Such families would provide nations with multiple children, increasing fertility as well as productivity. Meanwhile, the influx of more immigrants takes away employment and triggers social conflicts. The government should optimize its immigration laws to provide social benefits to highly skilled and fertile immigrants and to promote ethnic harmony.

3.3.3. Advances in Automation and Robotization

This strategy is not directly associated with raising the fertility rate. However, it re-mains evident that the purpose of increasing the fertility rate is to increase the demographic dividend and thus increase social productivity. The promotion of automation contributes di-rectly to the increase of social productivity, which is called the "invisible fertility rate", and therefore is discussed. Advances in automation and robotization in manufacturing are anoth-er trend that may reduce the negative impact of an aging population. First, automation di-minishes the requirement for workers in a given sector by boosting productivity. Second, the relative cost of goods produced through automation decreases, raising the overall material standard of living. Rather, as automation reduces the resources needed to produce one set of goods, these resources are shifted elsewhere, resulting in an increment in the manufacture of other commodities. While higher productivity is generally positive for it enables companies and economies to do more with less. But any big jump in productivity can be highly disrup-tive and take a heavy toll on employment. Frey and Osborne (2013)[33] argue that 47% of jobs are at high risk of being automated in the next two decades. To ensure support for com-puterization and reduce the social tensions derived from it, governments and societies need to plan and coordinate training activities (Swan, 2017) [34] . To summarize, automation drives down the cost of manufacturing commodities and utilizes resources more efficiently. And yet it inflicts serious damage on employment, which also necessitates government-directed retraining of staff at risk of unemployment.

3.4. Overall effect of raising low birth rates in developed countries

The demographic dividend is a phenomenon whereby as birth rates and life expec-tancy rise for the next generation, this may lead to an increase in lifetime savings to finance consumption in old age, enhancing investment potential. The growth in per capita income is theoretically likely to increase in proportion to the increase in life expectancy since aging is anticipated to produce an incremental increase in capital per worker over time.

Also, a rise in fertility helps to ensure the elderly have a high quality of life. This is due to the fact that it addresses the pension gap, which helps to mitigate long-term risks, as well as the acknowledged medical care shortfall, as hospitals are increasingly in need of competent long-term care facilities and specialized medical personnel to accommodate the aging population. Moreover, moderate population growth would

contribute to a demograph-ic equilibrium by raising the percentage of young, active adults. Current fertility rates may be seen as consistent with maintaining a relatively satisfactory balance between the compet-ing goals of a manageable population age structure and a manageable growth rate.

The arrival of children brings new economic pressures and increases the value of pa-rental leave. In addition, in societies, higher birth rates also increase population growth and therefore may increase urban congestion, biodiversity loss and carbon emissions.

4. Conclusion

In the discussion session, it describes the positive and negative effects of low fertility and evaluate three policies, child care services, immigration policy, and accelerating the au-tomation process. Of the three policies, one directly affects fertility, known as child care services, and two are regarded as invisible fertility that propels productivity, namely immi-gration policy and the automation process.

Within a household, having up to two children allows children to enjoy better educa-tional resources and thus earn more money. For women, fewer children lighten their burden and will be in a position to work more smoothly. In addition to this, low fertility speeds up the process of capital accumulation and enables economic growth, which is also largely at-tributable to the capital transition.

However, the effects of low fertility are significantly dissimilar in the short and long run. As shown in the above paragraph, in the short run the impact is biased positive, both at the micro and macro levels. In the medium term, as the population ages and birth rates de-cline, Social Security would have insufficient reserves to deliver the promised benefits and costs, leaving a gap that would grow wider if not filled. In addition, a declining population affects government revenues due to a reduction in consumption and personal income taxes. Also, the capital deepening mentioned in the short term leads to inequality and solidification of classes, making it harder for the population to leapfrog. Therefore policies are required to be implemented to ensure that these serious negative effects are weakened.

The childcare policy raises the fertility rate by reassuring parents, especially mothers, to engage in work. And the policy would have a multiplier effect, adding more positions and thus accelerating the increase in national income. Since the fertility rate of immigrants is higher than that of developed countries, the immigration policy would provide the country with high-quality personnel and to some extent fill the pension gap. However, the political and cultural background of the foreign population is diverse, thus the government provides the necessary policies to accommodate foreign residents. While automation is a direct influ-ence on productivity, the transformation of companies may result in structural unemploy-ment, so the government requires the organization of worker training activities and the crea-tion of new jobs.

Maintaining the infant bonus makes perfect sense as increasing fertility rates are fol-lowed by a demographic dividend and ensure a higher quality of life for the older population. It also brings new demographic pressures, such as urban congestion and environmental pol-lution.

This paper provides a more comprehensive analysis of low fertility in developed countries, and offers some suggestions for discussion and consideration regarding the causes, effects, and policy recommendations of low fertility. Because the theoretical recommenda-tions provided in the paper have not been fully implemented, some of the pros and cons re-main to be evaluated over time, with feasibility to be examined in the future.

The feasibility of different policies need to be further studied, possibly also with more data and more empirical basis in order to determine which policies should be imple-mented. Other than policies implemented in America, the further research would evaluate the impacts of those policies in more diverse countries, not only those most typical devel-oped counties, but those with high birth rate and willing to lower the population growth as well.

5. Evaluation

My research on demography commenced last summer as I was completing a research paper on the evolution of China's fertility policy. In the process of searching relevant litera-ture, I found that articles studying the pros and cons of low fertility in developed countries were scarce, so I decided to write a dissertation on increasing fertility in developed countries.

While numerous researchers have already provided a thorough knowledge of the causes of low birth rates, I will first explain the positive and bad effects that result from them before determining whether the disadvantages exceed the benefits. The discussion of consequence accounts for a substantial percentage of the consequences of rising reproduc-tion rates because of the different factors I discussed, including capital deepening and fe-male status, and is therefore more conclusive than comprehensive. Some of the solutions I proposed, such as those involving immigration and automation, are thought to be novel and noteworthy topics for discussion because they try to raise the overall demographic dividend rather than immediately improve the situation.

In the writing process, I used examples based mostly on the situation in the United States, the most typical developed country, largely because the data available in the United States are more convenient to locate. However, due to the slightly different policies and sit-uations in developed countries, I ignored the context of other developed countries, thus a large portion of the recommendations are not compatible with each country. The conclu-sions are rather biased and somewhat targeted (mainly for the US).

In future more in-depth studies, I will not only treat the US as an example, but data from other developed countries will also be discussed. As I study the economy more thor-oughly, I will attempt to programmatically construct models to demonstrate whether the pol-icies I suggest in this article are actually effective.

My planning for the pre-writing process did not work as expected, resulting in a more intense and rushed post-writing process. For example, my literature review took a whole se-mester to complete, while the later part of the discussion only occupied a month to complete the first draft. In the future, I strive to finish the first draft ahead of time and leave more time for revision.

In order to more easily transition to my future academic life, I have learnt through writing the dissertation how to more effectively search for information relating to the topic and which economic journals are generally considered authoritative. Also, the dissertation's discussion of concepts like the demographic dividend, population pyramid model, and de-pendence ratio broadened my grasp of demography and sparked my interest in learning more about it.

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