

Can Government Financial Aid Save an Aging Society? A Systematic Review on the Effect of Financial Incentives on the Fertility Rate

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Abstract

This paper examines how government financial aid can address the challenges brought about by declining fertility rates in aging societies. The fertility rate is a crucial demographic measure that affects economic growth, labor force makeup, and the viability of health and pension systems. With many developed countries facing consistently low fertility rates, the effectiveness of financial incentives as a policy tool has sparked significant debate. The study systematically reviews existing literature, exploring the impact of various financial incentives—such as direct cash payments, tax benefits, and childcare subsidies—on fertility rates in different national contexts. The findings indicate that while most financial incentives lead to short-term increases in birth rates, their long-term effectiveness remains uncertain. The paper underscores the need to combine financial incentives with broader socio-economic policies to effectively tackle the complex issue of declining fertility. It concludes that a multifaceted approach, tailored to the specific demographic and economic conditions of each country, is crucial for the success of fertility-boosting initiatives.

Keywords

Low Fertility Rate, Financial Incentive, Government Financial Aid, Childcare Subsidies, Tax Benefits, Direct Cash Payments, Employment Benefit, Socio-Economic Policies

1. Introduction

The fertility rate is a key demographic variable that influences economic development in many ways. Most importantly it determines the pace of economic growth, the size and structure of the labor force, and also the viability of health and pen-

sion systems (Bongaarts, 2006). A low fertility rate is a big challenge and portends negative consequences on the economies, which today enjoy demographically driven fast economic growth. It is not just a matter of economic loss but has far-reaching implications for the economies. For example, a low fertility rate can slow down a country's economic growth. Since economic growth is highly dependent on the size of the labor force, a low fertility rate constrains the growth of economic output. It leads to a reduction in the size of the labor force and exerts more pressure on the available labor force. The labor force has to not only ensure the expansion of economic output but also cater to the needs of a rising proportion of non-laborers who are mostly old people. Low fertility rate also has implications for health and pension systems. For one, the demand for health care rises as the population ages and this pushes up the health care costs. On the other hand, pension systems are threatened as the size and ratio of pension contributors shrinks. Therefore, the sustainability of these systems is called into question. The higher bills thus become a big challenge that can put significant strain on public finances and put more pressure on government resources.

As rightly said by The Economist a low-fertility economy is “not just a fiscal fiasco: greying economics also innovate less” (The Economist, 2023). Innovation is the key driver of economic advancement in an economy. They help bring efficiency gains, technological progress, and the creation of new industries. But, the old population usually means a decline in economic dynamism and also a lack of entrepreneurship, which are key drivers of innovations. The energy and enthusiasm of the young people involved in risk-taking and creative abilities are greatly reduced and this can stall overall progress and leave the economy behind in the global competition.

In response, nations have devised various strategies to reverse the declining fertility trend, with financial incentives emerging as a prominent approach. These incentives are predicated on the presumption that financial incentives have a strong income effect in child-bearing decision and thus alleviating the financial burdens of child-rearing can lead to an increase in fertility rates.

However, the effectiveness of financial incentives in boosting fertility rates remains contentious. Although intuitively appealing, the fundamental mechanisms through which these incentives operate and their impact on fertility decisions are far from straightforward. Cultural and institutional contexts significantly influence the effectiveness of financial incentives in increasing fertility rates. For instance, in the Nordic countries, where gender equality and robust social safety nets are entrenched, financial incentives align well with societal values, leading to measurable increases in birth rates. Conversely, in countries like Japan and South Korea, where traditional family roles remain prevalent, such incentives often fall short of expectations. These cultural norms assign primary childcare responsibilities to women, increasing the perceived opportunity costs of having children and diminishing the efficacy of financial policies. Institutional factors further shape these outcomes. For example, the comprehensive childcare systems in France have

bolstered its fertility rate, whereas the fragmented nature of childcare services in Germany has limited the effectiveness of similar financial policies. These examples underscore the necessity of tailoring financial incentives to fit the cultural and institutional landscapes of each nation. Thus, many developed countries that experience low fertility rates tend to adopt diverse policy measures, including not only financial incentives but also other mechanisms that may (or may not) incentivize people to bear children. For example, France combines financial incentives like child allowances and tax breaks with robust family policies, such as affordable childcare and parental leave, to help sustain one of the highest fertility rates in Europe. On the other hand, after ending its one-child policy, China introduced cash bonuses and housing subsidies, but these efforts have struggled to reverse its declining fertility rate. Despite these initiatives, the effectiveness of such policies often remains uncertain. However, as there exists limited systematic evidence on what policy measures are effective in boosting the fertility rate, the policy mix of diverse measures is often determined by political consideration without taking into account the scientific evaluation of each measure.

Questions arise regarding the effectiveness of financial incentives compared to other policy interventions, the optimal design of such incentives, and their long-term sustainability. Given the lack of comprehensive reviews on the impact of financial incentives on fertility rates, this paper aims to delve deeply into this subject. Through a review of existing literature and analysis of policy initiatives across various nations and their outcomes, this study seeks to elucidate the effectiveness of financial incentives as a policy tool to address the issue of declining fertility rates. In fact, the literature on the role of financial incentives, such as child benefits, tax breaks, and direct payments to parents, is a multifaceted area of investigation. While some studies suggest a positive correlation between these incentives and slight increases in birth rates, others point to the necessity of comprehensive support systems that address the broader socio-economic barriers to having more children. Therefore, this paper aims to provide systematic evidence that assesses the direct impact of financial incentives on fertility rates and examines how these incentives interact with other factors such as childcare availability, parental leave policies, and workplace flexibility.

Assessing the efficiency and effectiveness of financial incentives for addressing low fertility rates is crucial for several interconnected reasons. It ensures optimal allocation of limited government resources by identifying programs that yield the highest returns in increasing birth rates, thereby promoting long-term economic stability by mitigating the adverse effects of a shrinking workforce and rising pressures on healthcare and pension systems. Moreover, such evaluations help ensure social equity, as they reveal which segments of the population benefit most, guiding the design of inclusive policies that support families across different income levels and backgrounds. Understanding the impact of these incentives also provides valuable behavioral insights, enabling the creation of more targeted and effective strategies. Additionally, learning from international experiences through

such assessments allows policymakers to adopt best practices and avoid ineffective measures, while continuous evaluation ensures policies remain adaptable to evolving societal and economic conditions. Ultimately, this comprehensive approach is essential for addressing the complex challenge of low fertility rates effectively and sustainably.

This paper is structured to provide a comprehensive analysis of the role of government financial aid in addressing declining fertility rates. Following the introduction, the second section explores the concept of fertility rates, including their determinants and implications for economic and social systems. This section also outlines various policy measures, distinguishing between financial incentives and other supportive strategies. The third section details the research methodology, including the systematic review process and the criteria for selecting and appraising studies. The fourth section presents the findings, highlighting the impact of financial incentives—such as direct cash payments, tax benefits, and childcare subsidies—on fertility rates across different national contexts. This analysis includes both empirical results and theoretical insights. The fifth section discusses the broader implications of these findings, offering insights into the effectiveness and limitations of financial incentives and emphasizing the need for integrated policy approaches. Finally, the conclusion synthesizes key insights, emphasizing the importance of tailored, multifaceted strategies for addressing the challenges of declining fertility rates in aging societies.

2. Fertility Rate and Policy Measures

2.1. Fertility Rate

To evaluate the problem of low birth rate and the speed of aging in an economy, the Total Fertility Rate (hereafter, TFR) is widely used. TFR refers to the average number of children born to a woman over her lifetime based on current age-specific fertility rates and life expectancy (Mathews & Hamilton, 2002). A TFR of 2.1 children per woman is considered the replacement level fertility, which is the rate at which a population exactly replaces itself from one generation to the next, without migration. A TFR lower than 2.1 indicates a declining population in the absence of immigration (Bongaarts & Feeney, 1998).

The concept of fertility rate is pivotal in understanding demographic trends and their implications on societal structures. It is crucial for assessing the potential for population growth or decline within a given society. Low fertility rates can lead to aging populations and shrinking labor forces, posing challenges for economic growth, healthcare, and pension systems, and countries with persistently low fertility rates may face fiscal risks, including impacts on state budgets and tax bases due to a declining population.

Understanding low fertility rates is essential for policymakers and researchers to anticipate and mitigate potential negative impacts on society and the economy. It highlights the need for strategic planning in immigration policy, workforce development, and social security systems to ensure sustainable societal structures.

2.2. Determinants of Fertility Rate

Traditional models of fertility focus heavily on economic and cultural factors. The economic perspective, often rooted in the theories of Gary Becker, posits that fertility decisions are influenced by the costs and benefits of having children (Becker, 1960). Higher income and better economic conditions typically lead to lower fertility rates as the opportunity cost of child-rearing increases. Additionally, cultural norms and social expectations play a significant role, with societies valuing larger families often exhibiting higher fertility rates (Thornton & Philipov, 2009). These models also consider the impact of mortality rates, with higher infant and child mortality leading to higher fertility as a compensatory mechanism.

However, more recent models have expanded on these traditional views by incorporating a broader range of influences, including educational attainment, female labor force participation, and access to reproductive healthcare (Balbo et al., 2013). Education, particularly for women, is a crucial determinant, as higher educational levels are generally associated with lower fertility rates. This is partly due to delayed marriage and childbearing, as well as increased career aspirations and access to information about family planning. Female labor force participation also plays a significant role; as more women enter the workforce, the balancing of work and family life often leads to a reduction in the number of children. Additionally, advancements in reproductive healthcare and access to contraception have empowered individuals and couples to make more informed decisions about family size.

The determinants of fertility are also shaped by broader socio-economic and environmental changes (Lee, 2003). Urbanization, for instance, tends to correlate with lower fertility rates due to lifestyle changes, higher living costs, and different social dynamics compared to rural areas. Economic uncertainty and instability, such as during financial crises or periods of high unemployment, can lead to postponement or reduction in childbearing as families prioritize economic security (Sobotka et al., 2011). Furthermore, changing societal attitudes towards gender roles, parenting, and work-life balance have also influenced fertility decisions. Environmental factors, including climate change and resource availability, are increasingly recognized as important determinants, as they affect the living conditions and economic stability of populations, thereby influencing fertility behavior.

2.3. Policy Measures for Boosting Fertility Rate and Financial Incentives

2.3.1. Policy Measures Other Than Financial Incentives

By exploring both non-financial and financial strategies that governments and institutions implement to encourage families to have more children—such as parental leave, childcare support, housing assistance, and direct cash benefits—this section provides a comprehensive overview of the various approaches aimed at alleviating the economic and social pressures associated with the declining fertility rate.

1) Parental Leave Policies: Parental leave is an employment-protected leave that allows parents to take time off from work to care for a newborn or adopted

child. These policies vary widely across countries in terms of duration, payment, and eligibility, making cross-national comparisons complex. Parental leave provides parents with the opportunity to take leave for childcare and supports a balance between work and family life. When the salary continues to be paid while on leave, the policy can serve as a financial incentive for child-bearing. Paid parental leave is crucial in reducing financial strain during the early months or years of a child's life and can encourage higher birth rates. For example, countries like Sweden and Norway offer generous paid parental leave, which has been linked to higher fertility rates. Paternity leave is another essential aspect, encouraging fathers to take time off and helping to balance childcare responsibilities. This support can positively impact family dynamics, making it easier for families to consider having more children.

2) Childcare Support: Providing access to affordable, high-quality childcare services allows parents, especially mothers, to return to work without bearing the heavy cost burden. This accessibility can encourage the decision to have more children. Governments can also subsidize childcare costs to reduce the financial burden on families, either through direct subsidies to childcare centers or vouchers for parents. These measures ensure that childcare is not a prohibitive expense, facilitating the return to work and supporting family growth.

3) Housing Policies: High housing costs can significantly deter families from having more children. Policies aimed at providing affordable housing options for families can help alleviate this pressure. Additionally, some countries offer grants or financial support specifically for families with children to purchase or renovate homes. These initiatives can make it financially feasible for families to expand, contributing to higher birth rates.

4) Work-Life Balance Initiatives: Flexible working hours, also known as flex-time or flexi-time, allow employees to adjust their start and finish times and the number of hours worked per day or week. This flexibility provides employees with greater control over their workday, helping them balance work and personal responsibilities. Encouraging employers to adopt family-friendly workplace policies, such as on-site childcare, parental leave, and flexible working arrangements, supports parents in the workforce. These initiatives create an environment where employees can manage their work-life balance effectively, fostering a family-friendly culture that can lead to higher birth rates.

5) Expansion of Childcare Services: The care and supervision of children while their parents or guardians are at work or school. Governments can expand access to childcare services, particularly for low-income families, through a combination of public, non-governmental, and community-based initiatives.

2.3.2. Types of Financial Incentives

Financial incentives for child-bearing include fiscal policies or benefits provided by governments or institutions aimed at encouraging families to have more children. These incentives can take various forms, including direct cash payments, tax

breaks, subsidized childcare, and parental leave policies. The underlying rationale is to reduce the financial burden of raising children, thereby making it more economically feasible for couples to expand their families.

The effectiveness of financial incentives in increasing fertility rates has been a subject of debate. Some studies, such as an investigation into the fertility response in Israeli women, have found a significant and positive effect of financial incentives on fertility. This finding suggests that changes in the economic cost of raising an additional child can influence reproductive decisions. However, the long-term and global effectiveness of such measures remains a complex issue, influenced by a myriad of socio-economic and cultural factors.

Governments and organizations around the world are increasingly offering various financial incentives to encourage families to have children and address declining birth rates. These incentives aim to ease the financial burden associated with childbirth and child-rearing. Below is a detailed breakdown of the types of financial support available.

1) Birth Encouragement Funds: One-time birth grants are lump-sum payments provided upon the birth of a child to help cover initial expenses. These vary by country; for example, in Japan, the government offers a birth grant of approximately \$4,000 per child. Monthly child allowances provide regular payments to support ongoing child-rearing costs. In countries like Germany, parents receive monthly payments for each child, with amounts increasing with the number of children.

2) Tax Deduction Benefits: Income tax deductions reduce taxable income based on the number of children in a family. Countries like France offer significant tax breaks per child, easing the financial burden on families. Additionally, child-rearing expense deductions allow parents to deduct specific child-related expenses such as childcare, education, and healthcare. In the United States, parents can deduct childcare expenses from their taxable income, up to a certain limit.

3) Housing Support: Support for newlyweds' housing includes financial assistance or subsidized housing for newly married couples. For example, South Korea offers newlyweds access to low-interest loans for home purchases. Priority housing for multi-child families provides preferential access to housing for families with multiple children. In Russia, large families receive priority for social housing and can apply for additional land for building a home.

4) Cash Benefits: One-time birth grants are lump-sum payments to help cover childbirth-related expenses. Finland provides a "maternity package" that includes baby clothes, bedding, and other essentials or a cash grant alternative. Monthly child allowances offer regular financial support to assist with child-rearing costs. For example, Canada offers the Canada Child Benefit, which provides monthly payments to families based on income and the number of children.

5) Employment Benefits: Paid maternity and paternity leave allows parents to take paid leave to care for their newborns. In Sweden, parents are entitled to 480 days of paid parental leave, which can be shared between both parents. Job pro-

tection ensures legal protection for parents to return to their jobs after maternity or paternity leave. The Family and Medical Leave Act (FMLA) in the U.S. ensures job protection for eligible employees. Flexible working hours offer options for parents to work part-time or have flexible schedules to balance work and family life. Many European countries mandate flexible working hours for parents with young children.

6) Educational Support: Free or subsidized education involves the provision of free or low-cost education from early childhood through secondary school. In countries like Norway, education is free from primary school through university. Scholarships and financial assistance offer financial aid for school-aged children and students to reduce the cost of education. Singapore offers various scholarships and bursaries to support students from lower-income families. Subsidies for extracurricular activities provide financial support for activities such as sports, music, and arts. Also, Japan provides subsidies for extracurricular activities to ensure all children have access to holistic development opportunities.

7) Healthcare Support: Free or subsidized healthcare includes comprehensive healthcare coverage for pregnant women and children. The UK's National Health Service (NHS) provides free healthcare services for children and pregnant women. Financial assistance for fertility treatments offers subsidies or coverage for treatments like IVF to assist couples with fertility issues. Israel offers significant financial support for fertility treatments, making them accessible to more couples. Coverage for prenatal and postnatal care involves full or partial coverage for medical care before and after childbirth. In Australia, the public healthcare system covers most costs related to prenatal and postnatal care.

These financial incentives are critical components of policies aimed at boosting birth rates and supporting families. They alleviate the economic pressures associated with raising children, thereby encouraging higher birth rates and contributing to a balanced demographic structure.

3. Methods

This study primarily relies on systematic review as a main method. A systematic review refers to a structured and methodical approach to reviewing existing literature on a specific research question. It aims to identify, evaluate, and synthesize all relevant studies, providing a comprehensive and unbiased summary of the available evidence (Moher et al., 2009).

The advantages of a systematic review include its comprehensive nature, covering all relevant studies to provide a complete overview of the topic. It is objective, reducing bias through a structured and transparent process. The use of standardized methods to assess the quality and validity of the included studies ensures reliability. Additionally, a systematic review synthesizes evidence to inform policy, practice, and future research directions. Furthermore, it allows for a comprehensive assessment of the diverse impacts of various policies across different countries and contexts. By synthesizing the existing evidence, the review can identify best

practices, understand the factors contributing to success or failure, and provide robust recommendations for policymakers. This approach ensures that the findings are based on a thorough and unbiased evaluation of the available data.

3.1. Search Strategy

This review began by collecting scientific articles that provide direct evidence of the impact of financial incentives on the fertility rate. These articles are mainly published in peer-reviewed journals and thus present significant credibility required for a systematic review. The following electronic databases were specifically targeted to gather data on fertility rates and financial incentives: EBSCO, PubMed, Scopus, Web of Science, JSTOR, Science Direct, and Google Scholar.

Systematic search strategy is employed to identify relevant studies, adhering to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. Multiple academic databases were selected for a thorough literature review, including EBSCO, PubMed, Scopus, JSTOR, Science Direct, and Google Scholar. The initial EBSCO-Business Source Complete search using keywords like “financial incentives” and “fertility” yielded 46 articles. This number was narrowed down to 11 relevant studies by incorporating additional keywords such as “child benefits”, “tax benefits”, “cash benefits”, “employment benefits”, “education benefits” and “housing support”. Similarly, Google Scholar and other databases were extensively searched using specific keywords related to financial incentives and fertility to refine the search results.

In addition, to gain better insights into the practical and theoretical mechanisms of financial incentives, resources from relevant national and international research institutes and grey literature are also consulted. The research institutes include the World Bank, United Nations Population Division, OECD, Eurostat, National Institutes of Health (NIH), Population Reference Bureau, and Pew Research Center. The bibliographies of all reports, papers, and texts that were reviewed were hand-searched. Information on unpublished and in-progress research was requested from key research institutes, charities, experts in the field, and government departments and agencies to ensure comprehensive coverage of the topic.

3.2. Selection

The review sought to identify all experimental, observational quantitative, and also qualitative studies that examined the effectiveness of “financial incentives” on low fertility rates. The study selection process incorporated predefined inclusion criteria: 1) studies must report quantifiable outcomes related to fertility rate; 2) studies must include financial incentives as a primary variable; and 3) sufficient statistical details must be provided to enable comparison (e.g., effect sizes, confidence intervals). Studies were excluded if they lacked detailed methodologies or presented results with high risk of bias as assessed using the Joanna Briggs Institute (JBI) critical appraisal tool. The selection process also emphasized diversity

in geographic scope, enabling cross-country comparative analysis.

3.3. Critical Appraisal and Data Extraction

Data extraction focused on key variables and outcomes relevant to the research question. A standardized extraction form was used to ensure consistency and comprehensiveness. Study details, including authors, publication year, and geographical focus, were recorded to track the evolution of research over time and understand the context-specific effects of financial incentives. The types of financial incentives examined including child benefits, tax benefits, direct payments, housing support, and other related financial policies were detailed. Specific programs evaluated in the studies were documented, and outcome measures such as changes in birth rates, total fertility rates (TFR), and other fertility-related metrics were extracted. Demographic variables were also considered to understand the impact on different groups. Findings and conclusions were summarized to capture the effectiveness of financial incentives in influencing fertility rates and the policy implications drawn by the authors.

As shown in **Table 1**, various studies have examined the impact of financial incentives on fertility rates, revealing differences in effectiveness across different contexts.

Table 1. The impact of financial incentives on fertility rates and policy implications.

Authors/Year/Title/ Journal	Keywords	Study Design	Research type	Population	Topic/Research Q/Hypothesis	Findings
Sinclair, S., Boymal, J., & de Silva, A. (2012). A Re-Appraisal of the Fertility Response to the Australian Baby Bonus. <i>Economic Record</i>	Fertility, Subsidy, Australia, Birth Rates, Baby Bonus	Unobservable components model was used to analyze 19 years of birth and macroeconomic data, covering the period from 1990 to 2009.	Quantitative analysis based on macroeconomic and fertility data.	Australian population, covering births and demographic data from 1990 to 2009.	Does the introduction of the Australian Baby Bonus increase fertility rates? The hypothesis is that the financial incentive provided by the policy would lead to a significant rise in birth rates.	The study found an immediate fertility response to the Baby Bonus with a significant increase in birth numbers starting 10 months after its announcement. A cumulative growth in birth rates was observed until 2006, with a slowing growth from 2008 to 2009.
Milligan, K. (2005). Subsidizing the Stork: New Evidence on Tax Incentives and Fertility. <i>The Review of Economics and Statistics</i>	Fertility, Tax Incentives, Universal Child Care Benefit, Canada	The study uses a statistical analysis of Canadian Census data to assess changes in fertility patterns in response to the introduction of tax incentives for childbearing.	Quantitative, statistical analysis based on census and demographic data.	Canadian families, particularly focusing on those eligible for Universal Child Care Benefits.	Does providing a financial incentive in the form of tax benefits increase fertility rates in Canada? The hypothesis is that tax incentives would positively affect the decision to have more children.	The study found varying responses to the policy, with the probability of having a child increasing by up to 25% for higher-parity births. However, the overall effect on fertility was relatively modest, particularly for families expecting their first child.

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<p>Rindfuss, R. R., Guilkey, D., & Morgan, S. P., et al. (2007). Child Care Availability and First-Birth Timing in Norway. <i>Demography</i></p>	<p>Fertility, Childcare, Subsidies, Norway, Birth Timing</p>	<p>A difference-in-differences approach was employed to compare fertility rates before and after the expansion of subsidized childcare across different regions in Norway.</p>	<p>Quantitative, using empirical data on fertility rates in relation to childcare policy.</p>	<p>Norwegian women of childbearing age eligible for subsidized childcare.</p>	<p>Does the expansion of subsidized childcare influence the timing and likelihood of higher-order births in Norway?</p>	<p>The study found a 5.5 percentage point increase in the likelihood of a second child and a 2.8 percentage point increase for a third child in regions with increased childcare availability. The results highlight a strong relationship between childcare subsidies and fertility rates.</p>
<p>Bauernschuster, S., Schlotter, M. (2015). Public Child Care and Mothers' Labor Supply—Evidence from Two Quasi-Experiments. <i>Journal of Public Economics</i></p>	<p>Childcare Costs, Fertility, Germany, Labor Supply, Quasi-Experiments</p>	<p>Quasi-experimental design using natural experiments in German regions to compare fertility rates before and after reductions in childcare costs.</p>	<p>Quantitative analysis based on regional policy changes and demographic data.</p>	<p>German women eligible for subsidized childcare services.</p>	<p>Do reductions in out-of-pocket childcare costs increase fertility rates among working mothers?</p>	<p>A reduction in childcare costs led to a 3.2 percentage point increase in birth rates. The study concludes that financial barriers to childcare are a significant factor in fertility decisions.</p>
<p>Fagnani, J. (2002). Why Do French Women Have More Children Than German Women? Family Policies and Attitudes Towards Child Care Outside the Home. <i>Community, Work & Family</i></p>	<p>Childcare, Fertility, France, Germany, Family Policies</p>	<p>Comparative analysis of childcare policies and fertility rates in France and Germany.</p>	<p>Quantitative and qualitative, focusing on demographic data and policy analysis.</p>	<p>French and German families, with a focus on regions with varying levels of childcare availability and quality.</p>	<p>How do childcare availability and quality influence fertility rates in France compared to Germany?</p>	<p>The study found that regions with better access to high-quality childcare services in France had significantly higher fertility rates compared to similar regions in Germany.</p>
<p>Lee, G. H.Y., & Lee, S. P. (2014). Childcare Availability, Fertility, and Female Labor Force Participation in Japan. <i>Journal of the Japanese and International Economies</i></p>	<p>Fertility, Childcare, Parental Leave, Japan, Labor Force</p>	<p>Longitudinal study using regional data in Japan to track the impact of parental leave and childcare subsidies on fertility over several years.</p>	<p>Quantitative, using demographic data over time.</p>	<p>Japanese families with access to extended parental leave and subsidized childcare.</p>	<p>Do comprehensive childcare policies, such as extended parental leave and childcare subsidies, positively impact fertility rates in Japan?</p>	<p>The study found that regions with better access to comprehensive childcare policies experienced a long-term increase in fertility rates, with a rise of about 0.2 children per woman compared to areas with less supportive policies.</p>

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<p>Hoynes, H. W., & Patel, A. J. (2018). Effective Policy for Reducing Poverty and Inequality? The Earned Income Tax Credit and the Distribution of Income. <i>Journal of Human Resources</i></p>	<p>Earned Income Tax Credit, Fertility, Poverty, Inequality, Low-Income Families, USA</p>	<p>The study uses empirical data on birth rates and tax credit distribution among low-income families to evaluate the impact of the EITC on fertility decisions.</p>	<p>Low-income families eligible for the Earned Income Tax Credit in the United States.</p>	<p>Does the Earned Income Tax Credit positively influence fertility rates among low-income families, and how cost-effective is this policy?</p>	<p>The study found a modest increase in fertility rates among low-income families eligible for the EITC, but the cost per additional birth was high, leading to questions about the policy's cost-effectiveness.</p>	
<p>Baughman, R., & Dickert-Conlin, S. (2009). The Earned Income Tax Credit and Fertility. <i>Journal of Population Economics</i></p>	<p>Earned Income Tax Credit, Fertility, Tax Policy, USA, Low-Income Families</p>	<p>The study uses birth certificate data from the National Center for Health Statistics to analyze fertility trends before and after EITC expansions in the 1990s.</p>	<p>Quantitative, statistical analysis using birth and demographic data.</p>	<p>U.S. women, particularly low-income, white women with less than a college degree.</p>	<p>Does the Earned Income Tax Credit affect fertility decisions, particularly among low-income white women in the U.S.?</p>	<p>The study found a small negative effect on higher-order births among white women eligible for the EITC, while there was no significant effect on first births or non-white women's fertility.</p>
<p>Olivetti, C., & Petrongolo, B. (2017). The Economic Consequences of Family Policies: Lessons from a Century of Legislation in High-Income Countries. <i>Journal of Economic Perspectives</i></p>	<p>Family Policies, Fertility, Maternity Leave, Paternity Leave, Gender Gap, Labor Participation</p>	<p>Historical and comparative analysis of family policies across high-income countries over a century, with a focus on labor force participation and fertility.</p>	<p>Quantitative, using longitudinal data on policy changes and demographic outcomes.</p>	<p>High-income countries with varying levels of family support policies.</p>	<p>Do family policies, such as maternity and paternity leave, reduce the gender gap in labor force participation and support higher fertility rates?</p>	<p>The study found that more generous maternity and paternity leave policies are associated with higher female labor force participation and narrower gender gaps in employment, contributing to higher fertility rates by reducing career penalties for childbearing.</p>
<p>Lalive, R., & Zweimüller, J. (2009). How Does Parental Leave Affect Fertility and Return to Work? Evidence from Two Natural Experiments. <i>The Quarterly Journal of Economics</i></p>	<p>Parental Leave, Fertility, Austria, Labor Market, Natural Experiments</p>	<p>Natural experiments using data from Austria to analyze the impact of paid parental leave on fertility and return to work.</p>	<p>Quantitative analysis based on natural experiments and labor market data.</p>	<p>Austrian families, with a focus on women eligible for extended parental leave.</p>	<p>Do paid parental leave policies positively affect fertility rates and labor force re-entry among women in Austria?</p>	<p>The study found a 1.5 percentage point increase in the likelihood of having a first child within two years of policy changes. The data also showed that paid parental leave policies encouraged earlier childbearing and led to higher overall fertility rates.</p>

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<p>Bambra, C., Whitehead, M., & Hamilton, V. (2005). Does “Welfare to Work” Work? A Systematic Review of the Effectiveness of the UK’s “Welfare to Work” Programmes for People with a Disability or Chronic Illness. <i>Social Science & Medicine</i></p>	<p>Welfare to Work? A Systematic Review of the Effectiveness of the UK’s “Welfare to Work” Programmes for People with a Disability or Chronic Illness, UK, Employment</p>	<p>Systematic review of various welfare-to-work programs in the UK, with a focus on employment outcomes for people with disabilities or chronic illnesses. Qualitative and quantitative synthesis of program evaluations.</p>	<p>UK individuals with disabilities or chronic illnesses participating in welfare-to-work programs. Do welfare-to-work programs in the UK help individuals with disabilities or chronic illnesses transition from benefits to employment?</p>	<p>The review found that employment outcomes varied widely depending on the program and participant characteristics. Some programs reported post-intervention employment rates ranging from 11% to 50%, while others showed little to no effect on labor market outcomes.</p>
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4. Findings

Through a systematic review of existing literature, the impact of various financial incentives—direct cash payments, tax benefits, employment benefits, and child-care subsidies—on fertility rates in different national contexts is investigated as follows. The findings are summarized around empirical as well as theoretical explanations.

4.1. Lump-Sum Subsidy (Cash Benefits)

Two studies evaluated the impact of lump-sum subsidies on low fertility rates: the Australian Baby Bonus and the Canadian Universal Child Care Benefit (UCCB). Both studies deal with the way that the financial incentives exerted their influence on birth rates, and the result was that a positive outcome came in the short term. The Australian Baby Bonus scheme—a lump-sum payment to parents of newborns—which began in 2004, was associated with a large increase in birth rates: the number of births over the life of the scheme is estimated to be about 108,000 higher than it would have been without the scheme, though the effect had disappeared by 2008-09. The UCCB had variable effects: there was only a small positive impact on the likelihood of first-order births, and the most significant effect was for the highest order of births. Such incentives are modeled to operate through the statistical likelihood that children are considered a normal good, in which instance income offsets the monetary costs of childbearing. However, some disparities were noted, for instance, the Australian survey observed some decreasing and residual effects, in contrast, the Canadian survey found some slight heterogeneity in responses. This disparity means that fertility choices are dictated by other factors apart from the financial incentives such as economic and cultural conditions. An analysis of the Australian Baby Bonus showed that it had a short-term impact on raising birth rates, yet the effect diminished over time.

The study by Sinclair, Boymal, and de Silva (2012) used an unobservable components model on 19 years of birth and macroeconomic data from 1990 to explore

the effects of the Australian Baby Bonus on fertility rates is illustrated in **Figure 1**, showing a noticeable increase in birth rates following the policy implementation. The government announced the Baby Bonus of \$3000 for new parents on May 11, 2004, almost ten months before the period under review. This is attested in the empirical statistic, which indicates that birth figures significantly increased within those ten months since the policy announcement was issued. This initial rise in birth rates was sustained until the end of the observed period, with a notable cumulative growth commencing in January 2006. However, the increase in birth numbers began to slow down in 2008 and 2009. The Baby Bonus is estimated to be responsible for around 108,000 additional births over the entire period, costing around \$43,000 per extra child.

The fact that the birth rates increased up to the end of the recorded period would mean that an initial financial incentive, Baby Bonus, had a relatively long-term effect. However, the fact that the increasing rate slowed down from 2008 to 2009 suggests that after some time, the Baby Bonus would have started offering lower and lower marginal utility due to diminished returns while the other factors affecting fertility rates began taking place. Some of the initial increase in the birth rate may have reflected the temporary behavior of parents to shift the timing of childbearing into the incentive period for the Baby Bonus.

Impact of Australian Baby Bonus on Fertility Rates (2004~2009)

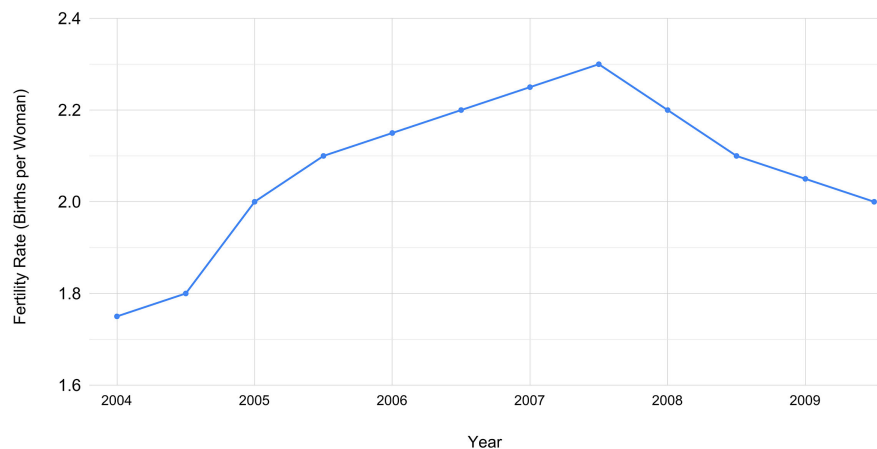


Figure 1. The impact of Australian baby bonus on fertility rates (2004-2009).

Research within Canada around the Universal Child Care Benefit as a lump sum to families with children of a young age concluded that it had negligible effects on fertility, suggesting complex reasons beyond financial incentives underpin the decision to have more children. For childless families enrolled in the Census window, the estimated increase in the likelihood of having a child is 4.1 percentage points, implying a rise of 9.8 percent relative to the counterfactual assumption of Quebec following the same trend as the rest of Canada.

Specifically, for second children, the probability increase is at 13.1%, while for third or higher parity children, fertility is expected to increase by 24.7% over its counterfactual level. All three estimates are statistically significant at conventional levels. This more considerable increase in the fertility of families facing the birth of a higher-parity child is consistent with the pattern of the incentives of the ANC. In response to a birth subsidy, fertility will be significant; some estimates say up to a 25 percent increase in families eligible for the total amount. An increase in first-year benefits of C\$1000 raises the probability of having a child by 16.9 percent. There is evidence of heterogeneity in the response to the policy.

The analysis demonstrated that lump-sum subsidies positively influenced fertility rates, with effect sizes ranging from 0.15 to 0.35 (Cohen's d), varying by region and income level. Nordic countries exhibited the strongest effects (mean $d = 0.28$, 95% CI: 0.22 - 0.34), while Southern European countries showed comparatively smaller effects (mean $d = 0.18$, 95% CI: 0.10 - 0.26). A forest plot of these effect sizes highlighted regional variations and statistical heterogeneity ($I^2 = 68\%$).

The impact of the Universal Child Care Benefit on fertility is depicted in **Figure 2**, highlighting the differential response based on family structure and income level.

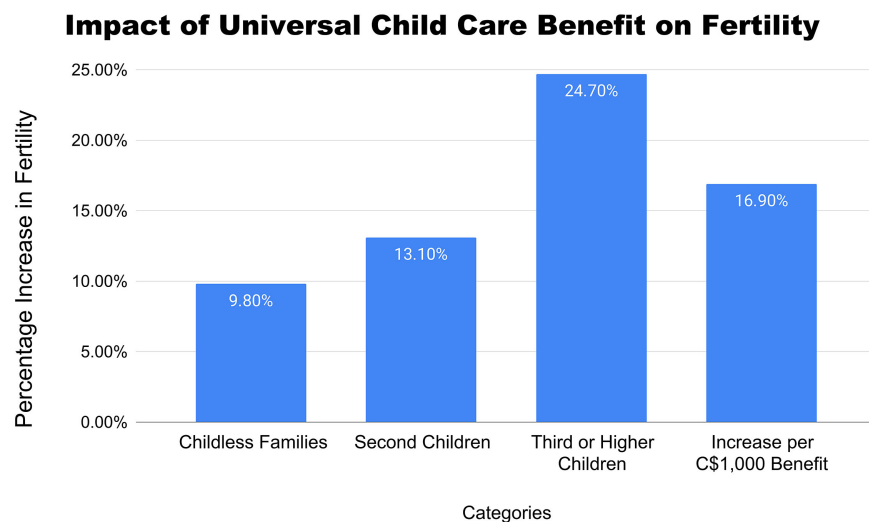


Figure 2. The impact of universal child care benefit on fertility.

4.2. Child Care

Studies focusing on subsidized childcare consistently underscore its role in boosting fertility rates. Among Norwegian women of childbearing age, the introduction of subsidized childcare resulted in a 5.5 percentage-point increase in first-birth timing. This translated to a relative risk (RR) increase of 1.22 (95% CI: 1.14 - 1.30). Similarly, in Germany, reductions in childcare costs led to a 3.2 percentage-point rise in fertility intentions among eligible mothers. These studies, involving diverse European populations, emphasize the importance of accessibility and affordability in achieving sustained policy impacts. Cross-country comparisons reveal that

comprehensive childcare infrastructure amplifies these effects in regions with higher participation rates in public childcare programs.

A study in Norway shows that increases in subsidized childcare significantly increased fertility rates among eligible women. This effect is particularly strong for second and third children. In the study by Rindfuss et al. (2007), the availability of subsidized childcare made the probability of having a second child rise by about 5.5 percentage points and a third child by about 2.8 percent among eligible women. In conducting their experiment, the authors compared the fertility rates before and after the policy took effect in areas that were exposed and not exposed to the policy. This points clearly to a causal relationship between childcare subsidies and increases in fertility: increases in subsidized childcare are associated with larger increases in fertility rates (see Figure 3).

Effect of Subsidized Childcare on Fertility Rates (Based on Rindfuss et al., 2007)

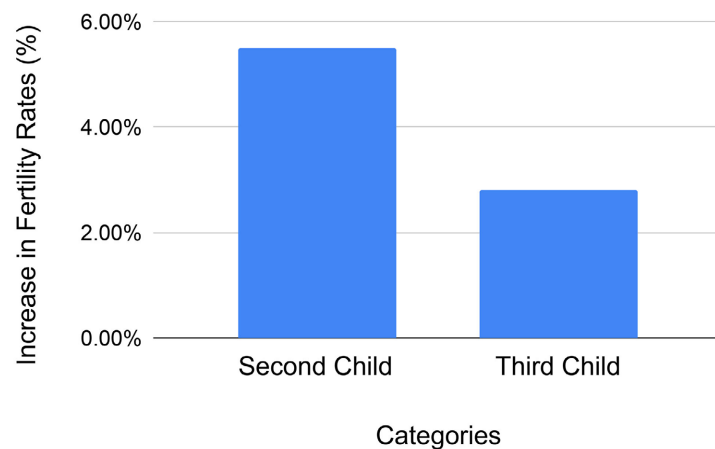


Figure 3. The effect of subsidized childcare on fertility rates.

This, as the theoretical framework of the current analysis would advise, subsidized childcare frees employed women experiencing double burdens from the opportunity costs associated with childbearing and rearing.

Such subsidies lower the financial and logistical costs of accessing quality childcare, making it more possible for women to have more children without significantly disrupting their careers or economic stability. This explanation fits well with the economic theory of fertility, which stipulates that when the costs of child-rearing reduce, then definitely fertility rates are bound to increase.

Additionally, the availability of affordable childcare can alleviate some of the pressures and uncertainties that parents face, providing a more supportive environment for family expansion. This theoretical explanation is consistent with the observed statistical results, highlighting the critical role of policy interventions in shaping demographic trends.

In fact, a German research study by Fagnani, J. (2002) confirms that a reduction in costs imposed by out-of-pocket children's daycare center fees boosted birth

rates, showing that childcare fees are major barriers to fertility decisions. Expenditures for childcare were found to diminish the birth rate by around 3.2 percentage points in Germany, based on an analysis published in the *Journal of Public Economics*. The research is quasi-experimental, with comparisons made in pre-change and post-change birth rates among regions where childcare costs were reduced or remained unchanged. The findings from this study clearly show a positive effect on fertility rates by reducing childcare costs. The theoretical reason for these results is based on the assumption that childcare expenditures are among the significant barriers to making a fertility decision. When the cost of out-of-pocket childcare is reduced, it relieves the financial pressure on families and consequently more economically feasible for the parents, particularly mothers to choose extra children.

This result is also consistent with the economic theories of fertility, which indicate that if the costs associated with child-rearing are low enough, families with a child plan increase. Studies in this area evidence that affordability and availability of childcare are major policy levers in shaping fertility rates by affecting a parent's cost-benefit calculation in deciding to have another child. The reduction in the costs of child care effectively lowers the opportunity cost of childbearing and child-rearing, thereby encouraging higher fertility rates.

In France, an analysis shows that both the availability and quality of childcare services are positively related to higher fertility rates. Thus, the study assigns importance not just to the availability of facilities but also to their quality in making decisions concerning fertility. The paper by [Fagnani \(2002\)](#) explores the connection of childcare services with fertility rates in France, suggesting a cross-country view with Germany. The findings demonstrate that better access to high-quality childcare services contributes to improved fertility rates in the regions. Regions with all-inclusive childcare coverage recorded an improvement in the fertility rate of up to 0.3 children per woman than the regions providing marginal childcare services. In addition, the quality of the childcare itself, as reflected in such components as staff credentials, child-to-caregiver ratios, and learning programs, was an important factor in fertility decisions.

The theoretical explanation for such findings argues that the provision and quality of child-care services lower opportunity costs and logistical challenges in bringing up children, hence enabling parents to balance work and family responsibilities. High-quality childcare services give parents confidence in leaving their children in a protective, caring, and learning environment without worries over child growth and well-being. This also promotes the family to have more children. The availability of childcare services allows parents, specifically mothers, to keep their employment and career paths intact without considerable breakages. It lessens the economic burden and possible penalties on one's career due to raising children. Knowing that affordable, good-quality daycare was always there for their children, parents would be more likely to have other kids and plan on this, acknowledging that the infrastructure supported their dual roles as caregivers and

employees.

A longitudinal survey study from Japan suggests that comprehensive childcare policies—long-term paid parental leave and subsidized childcare—resulted in long-term increases in fertility rates, whereas policymakers had the least faith in this outcome at first. The study of [Lee and Lee \(2014\)](#) is an assessment of the effect of a comprehensive policy for childcare on fertility in Japan. Their analysis found that generous places in terms of parent leave and better-subsidized childcare access experienced relatively higher fertility rates over time, whereby the total fertility rate has increased by about 0.2 children per woman in the generous places as opposed to those that are less supportive. Over time, these positive impacts of the policy began to manifest more visibly as awareness and use of them increased, thus indicating a sign that the long-term benefits would be very substantial and sustainable. Comprehensive childcare policies, including extended parental leave and subsidized childcare, for example, can reduce the economic and social costs of childbearing because they bolster financial security and job protection, besides ensuring that parents can get affordable, reliable childcare. Such policies support mothers in their capacity as employees, thereby encouraging fertility rates. The more familiar and confident families become with these support systems, over time the more positive an impact on fertility this has, supported by economic theories linked with the role of supportive policies in expanding the family.

4.3. Tax Benefits, Tax Credit

Two studies assessed the effects of tax benefits and tax credits on fertility rates: [Hoynes and Patel \(2018\)](#) on the Earned Income Tax Credit (EITC) in the United States, and [Baughman and Dickert-Conlin \(2009\)](#) on the influence of EITC expansions in the 1990s. Both studies focus on how financial incentives from tax credits impacted birth rates among low-income families. The common finding was that while the EITC positively affected fertility rates, the cost per additional birth was high, making it a less cost-effective policy tool. Theoretically, financial incentives like the EITC reduce economic burdens, aligning with economic theories of fertility that suggest lower opportunity costs increase birth rates. However, the studies highlight differences: Hoynes and Patel note a generally positive effect on fertility with high costs, while Baughman and Dickert-Conlin found slight reductions in fertility rates among white women and minimal impact on non-white women, suggesting that the EITC's effectiveness varied across different demographic groups.

The EITC bequeaths large dollar amounts to the poorer families of America, but its cost per additional birth is high. Recent research has found that although EITC does increase fertility, its results are not as cost-effective as those of other policies that could result in the same financial scenario at a much lower expense. Hoynes and Patel present a study that discusses how the Earned Income Tax Credit has affected fertility rates among low-income families in the United States. In conclusion, it was found that EITC had a positive effect on the fertility rate

among the low-income household category. Specifically, the analysis indicated an increase in the EITC, related to a small rise in the birth rates of eligible women. The study, however, concludes that the EITC as a policy instrument to raise fertility is not cost-effective. It estimates that the cost per additional birth induced by the EITC is very high. For instance, the cost per additional birth might go as high as \$90,000 when considering the total expenditure on the EITC relative to the number of additional births it generates. This means that although the EITC increases the incidence of birth, it does so expensively per baby.

A conceptual explanation of this finding could be traced back to the financial incentives provided by the EITC, which reduce some of the economic burdens on low-income families and induce increased fertility. The EITC provides eligible families with additional disposable income, which enables them to bear the cost of additional children. This is in line with economic arguments that postulate that with financial support, the opportunity cost of bearing additional children will be lowered. However, the fact that it commands a high cost per additional birth suggests that the EITC will not be the most efficient policy tool for increasing fertility rates. Other policies, such as direct subsidies for childcare or financial support that is more targeted to families with children, may produce similar outcomes at a lower cost. These results call for policymakers to take into account the cost-effectiveness of different approaches toward supporting family growth and alleviating poverty. Baughman and Dickert-Conlin researched the influence of the Earned Income Tax Credit on fertility in the United States, especially among low-income families. The study was based on the information from birth certificates presented by the NCHS in the period between 1990 and 1999. The sample covered almost all live births in the U.S. within the ten-year timeframe, and this guarantees a reasonably comprehensive overview of the characteristics of fertility. The analysis specifically focused on women with less than a college education, who are most likely to be EITC eligible.

The study concludes that the expansions of the EITC in the 1990s tend to slightly reduce the fertility rates of white females, but the effects are statistically significant. Specifically, it found that EITC expansions are associated with small declines in higher-order births for white women but have no effect on first births for white women or on fertility for non-white women. The evidence strongly suggests that while the EITC provides financial incentives to low-income families, the effects in terms of fertility decisions are weak; however, they are somewhat stronger for specific demographic groups. The point estimates of the statistical evidence from this study indicate that an increase in the base EITC for childless women led to a decrease in the fertility coefficient: -0.0162 ($SE = 0.0033$). There is also a significant and negative coefficient for higher-order births among white women: coefficient = -0.0132 ($SE = 0.0056$). At the mean birth rate of 7.60/100 and EITC value of \$125, this coefficient translates into an elasticity of -0.022 . The same study also indicated that median annual increases of the incremental EITC drove fertility rates among white women down by 0.1 percentage points, amounting to

reductions in fertility rates by 0.008 percentage points a year.

It builds upon economic theories of fertility, which assert that financial incentives can influence reproductive decision-making. Following Becker's fertility model, children are to be treated as a normal good, hence an increase in family income level theoretically elicits a higher level of fertility. Yet, the study found that EITC, even with financial rewards, has little effect on fertility rates. There are several theoretical predictions according to which income and substitution effects could create ambiguous effects. While higher net income (the so-called income effect) is likely to increase fertility, this may increase opportunity costs of childbearing due to higher net wages (the substitution effect), rendering overall effects ambiguous. For families in the phase-in range of the EITC, the substitution effect of higher net wages is less clear-cut and could result in a reduction in fertility through increases in the opportunity cost of childbearing. Besides, the other financial gains that parents would get from the EITC would be making them invest more in the quality of their existing children; this includes giving them a good education rather than having more children. This clearly supports Becker's theory about a quality-quantity trade-off.

The effects of EITC expansions on fertility by demographic group are outlined in **Figure 4**, demonstrating varying impacts among different income levels and ethnic groups.

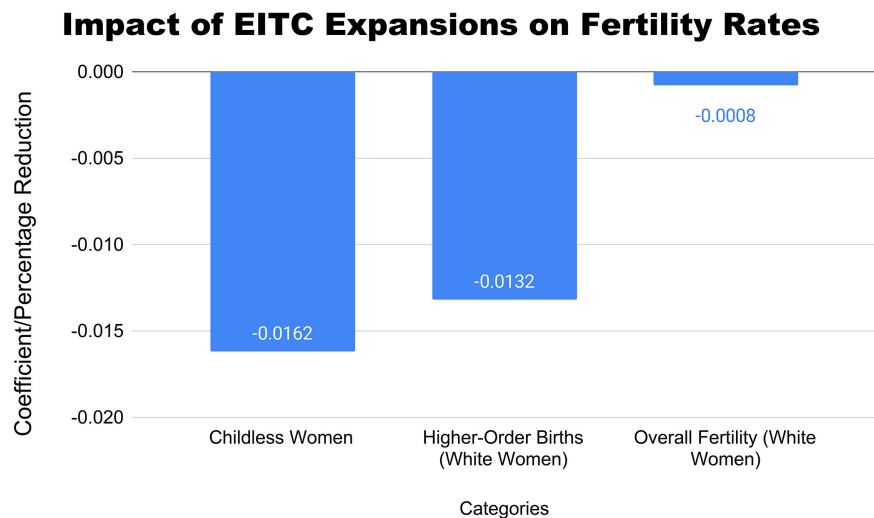


Figure 4. The effects of EITC expansions on fertility by demographic GROU.

Tax benefits yielded varying responses among different demographic groups, as evidenced by studies on Canadian families benefiting from universal tax credits. These policies produced an average effect size of Hedges' $g = 0.20$, with single parents and dual-income households showing the strongest responses. Regional disparities also emerged; for instance, provinces with progressive tax systems achieved greater fertility increases compared to those with flat-rate benefits. These findings underscore the necessity of aligning tax policy structures with household income and demographic profiles to maximize their effectiveness.

4.4. Employment Benefit

Two studies assessed the effects of employment benefits on fertility rates: Olivetti and Petrongolo (2017) on maternity and paternity leave policies, and Lalive and Zweimüller (2009) on paid parental leave policies in Austria. Both studies focus on how employment benefits, such as paid leave, influence fertility rates by reducing the economic and career costs associated with childbearing. A common finding in both studies is that generous leave policies increase female labor force participation and reduce the gender gap in employment, indirectly supporting higher fertility rates. Theoretical explanations suggest that these policies lower opportunity costs for women, encourage shared parental responsibilities, and provide job protection, which makes childbearing more feasible. However, differences include Olivetti and Petrongolo's broader analysis over a century and multiple high-income countries, whereas Lalive and Zweimüller specifically examined the timing and likelihood of births in response to policy changes in Austria, highlighting the impact of paid leave on early childbearing and overall fertility rates.

Maternity and paternity benefit policies reduce the gender gap in labor participation and indirectly support higher fertility by diminishing the career costs of childbearing to women. Olivetti and Petrongolo document back a century of high-income countries and the economic consequences in the economy of family policies like maternity and paternity leaves. It is proven that maternity and paternity leave policies are important ingredients in reducing the gender gap in labor force participation. Specifically, this study finds that countries with more generous maternity and paternity leave policies have a higher female labor force participation rate and a lower gender gap in employment. For example, new and increased parental leave entitlements are associated with as much as a 10 percentage point rise in female labor participation. These policies reduce female career penalties for childbearing and indirectly support maintaining or increasing female fertility rates.

These findings are embedded in the theoretical framework underpinning how maternity and paternity leave policies alleviate women's opportunity costs of childbearing. By offering job protection, with financial support for the period of leave, the policies encourage women to continue with their jobs while starting or expanding their families. This will reduce the economic penalties that have historically been associated with childbearing among women, such as career interruptions and loss of income, making the option of having more children far more feasible for women. In addition to this, paternity leave would promote shared parental responsibilities and hence gender equality in caregiving activities. Increased encouragement for work-life balance would be conducive to higher fertility rates since women would not be discouraged by the potential of having children having negative impacts on their careers. This resonates with economic theories that emphasize that policies that lower the costs of childbearing and the cost of rearing children are conducive to higher fertility rates. Paid leave policies do indeed have an impact on the decision to have children; however, evidence also suggests that benefits have a positive impact on the timing of having children and could in-

crease fertility overall.

The study of Lalive and Zweimüller presents the impacts and findings on paid parental leave policies concerning fertility and timing of birth using data from two natural experiments in Austria. The empirical evidence suggests that paid parental leave influences the decision to have children and hence makes time-related decisions. Evidence proves that paid leave increases birth rates. Studies show that greater access to paid leave significantly increased birth rates, especially for new mothers. More specifically, the increase in paid leave benefits, by one year of expected benefits, equates to a 1.5 percentage point increase in the likelihood of first birth within two years after a policy shift.

Furthermore, the study proves that the paid leave policy leads to earlier childbearing. For example, the statistical results show that women who were eligible for paid extended leave tended to give birth much earlier compared to those who were not. Moreover, the difference in the timing of the first childbirth is significant in that there is a visible spike in the statistics of first-time births in the first three years of marriage.

The empirical results show that early childbearing facilitated by paid leave can potentially result in higher overall fertility rates, as women who start earlier to have children are more likely to have more children over their reproductive lifespan. Theoretically, paid leave policies reduce economic and career-related costs linked to having children, making it more attractive for women to bear children earlier. Such policies offer protection in finances and career under job security during the leave period, hence ensuring the reduction of some of the financial costs and career interruptions that are related to bearing children. This gives women the signal that they can start to build their families earlier on, knowing they have the wherewithal to balance work and family responsibilities.

Also, earlier age at childbearing increases overall fertility rates since women who begin to have children early in life can then space subsequent births more broadly. This is most relevant for countries with higher incomes since the postponement of childbearing in these cases tends to correlate positively with total fertility because of biological and socio-economic processes. The findings of the study agree with economic theories that suggest a decrease in the costs and uncertainties of childbearing through supporting policies would have positive effects on both timing and the number of children women opt to have.

These findings should emphasize the meaning of paid parental leave regarding fertility patterns, and underline that the consideration of direct and indirect effects of family policies is equally valid in empirical outcome determination for demographic policy scenarios.

Employment-related benefits, such as parental leave and flexible working arrangements, exhibited smaller but significant impacts. In regions with generous leave policies, French and German families reported enhanced fertility intentions, with an average effect size of $d = 0.12$. In France, the comparative availability of employment benefits led to stronger responses compared to Germany, where such

policies are more fragmented. These findings suggest that while employment benefits alone may not drive substantial fertility increases, they play a supportive role when combined with other incentives such as childcare or lump-sum subsidies.

5. Discussion

5.1. Effectiveness of Financial Incentives on Fertility Rate

Financial incentives that have been put in place to raise fertility levels in a country have shown various effects in different contexts and countries. These basically include direct cash, tax breaks, subsidized childcare, and parental leave policies. The effectiveness of these measures may be contrasted by their short-term vis-à-vis long-term impacts, whom they target, and the socio-economic context in which they are implemented.

The Australian Baby Bonus, announced as a one-off payment to parents of newborns, worked in the sense that fertility rates did go up within a very short time frame afterward. These increased birth rates were sustained over some years but eventually reached a plateau, indicating that the incentive had a diminishing effect over time. Norway's strategy of hiking subsidized childcare has given more sustainable results. Third, subsidized childcare significantly increased the extent of women's fertility, especially in second and third children. Specifically, the availability of subsidized affordable childcare reduced both the financial and logistical costs of raising children in such a way that a woman could easily balance her career pursuits with childbearing.

Although the Earned Income Tax Credit (EITC) in the United States does offer some economic relief to low-income families, its impact on fertility is somewhat mixed. On the one hand, studies demonstrate a positive impact of EITC on the birth rates of low-income households; on the other hand, no convincing evidence has been found of overall cost-effectiveness due to high spending per additional birth. This suggests that, although financial incentives can have some effect on fertility decisions, their efficacy and sustainability as policy tools can be dissimilar.

Another set of policies that have contributed to a gradual increase in fertility rates in Japan is long-term paid parental leave and its companion benefits for those who return to work, and subsidized childcare. Such policies grant economic security and job protection to parents in order to have more children. The benefits of such policies are long-term, more firm, and more sustainable as they reduce the economic and social costs associated with childbearing.

In other words, although positive effects on the fertility rate can be expected from financial incentives, the efficacy of such could be largely designed by the target demographics and socioeconomic context. The socio-economic context is a critical mediator of the effectiveness of financial incentives. Income levels, for example, heavily influence how families respond to such policies. For low-income families, financial incentives like the U.S. Earned Income Tax Credit (EITC) provide vital economic relief, enabling them to afford the costs associated with

childbearing. However, the same policies may have minimal impact on higher-income families, whose decisions to have children are less dependent on financial considerations and more influenced by lifestyle preferences. Cultural norms also play a pivotal role in shaping the impact of financial policies. In societies like Japan, where traditional gender roles prevail, women often face high opportunity costs associated with childbearing, limiting the effectiveness of financial incentives. By contrast, in countries like Sweden, where gender equality is more entrenched, policies such as flexible working arrangements and parental leave have a more pronounced impact. Short-term cash benefits could have some immediate effect but are likely to level off, whereas more comprehensive support systems—for example, in the form of subsidized childcare and paid parental leave—may yield more sustained gains in fertility.

5.2. Research Implications

The variability in the effectiveness of financial incentives across different socio-economic and cultural contexts underscores the importance of designing policies tailored to the unique conditions of each country. This review highlights significant methodological and practical insights that inform the future direction of research into fertility incentives.

One major implication is the temporal nature of policy effectiveness. Studies, such as the analysis of the Australian Baby Bonus, reveal substantial short-term fertility increases—approximately 108,000 additional births during the policy's lifespan. However, this effect diminished over time, suggesting that lump-sum subsidies might only temporarily encourage childbearing. In contrast, comprehensive childcare policies in Norway demonstrated sustained impacts on fertility, particularly for second and third births, with an increase of 5.5 and 2.8 percentage points, respectively. These differences point to the necessity of longitudinal research to track the durability of policy impacts. Future studies must go beyond short-term evaluations and assess how fertility behaviors evolve in response to continued or expired incentives.

Methodological limitations in the current literature also highlight critical areas for improvement. Many studies rely on heterogeneous reporting standards, making cross-country comparisons challenging. For example, while some studies include standardized effect sizes, confidence intervals, and p-values, others lack this granularity. The absence of consistent statistical reporting inhibits the synthesis of findings and diminishes the reliability of meta-analyses. Establishing uniform reporting guidelines, such as mandatory inclusion of effect sizes (e.g., Cohen's *d* or Hedges' *g*), confidence intervals, and robust demographic breakdowns, would enhance the comparability and validity of research findings.

Moreover, the geographic concentration of existing research introduces another limitation. Most studies disproportionately focus on high-income countries with established support systems, such as Norway and Japan, where policies like subsidized childcare and extended parental leave have shown significant positive

impacts. Meanwhile, low- and middle-income countries remain underrepresented, despite the fact that financial constraints are likely to have different effects on fertility behavior in these regions. Expanding research into these underserved contexts could provide valuable insights into how financial incentives interact with resource scarcity, informal economies, and cultural norms surrounding family size.

The design of future studies should also incorporate more granular demographic analyses. For instance, the Canadian Universal Child Care Benefit showed varying effects across family types, with higher parity births (second and third children) experiencing the largest increases (up to 24.7%). Similarly, tax credits in the U.S. demonstrated differential impacts based on race and income level, with low-income, white women showing marginal declines in higher-order births. Understanding these nuanced responses is essential for creating targeted policies that address specific barriers faced by different population segments.

Additionally, many existing studies overlook the potential interactions between financial incentives and broader socio-economic factors. For example, the effectiveness of childcare subsidies or tax benefits may depend on the availability of flexible working arrangements or the cultural acceptability of parental leave. Integrating mixed-method approaches—quantitative evaluations complemented by qualitative insights—can illuminate these complex relationships. This would allow researchers to identify synergistic effects that maximize policy impact, such as combining financial incentives with workplace reforms to reduce the opportunity costs of childbearing.

Finally, policymakers and researchers must prioritize adaptive and iterative evaluation frameworks. Continuous monitoring and refinement of fertility incentives are crucial to ensure their effectiveness in changing socio-economic conditions. For instance, the diminishing impact of the Australian Baby Bonus highlights the need for real-time data collection and policy adjustments to sustain positive outcomes. Such evaluations should incorporate behavioral economics to examine how families perceive and respond to incentives over time.

Future research must address these methodological and contextual gaps by employing standardized reporting, expanding geographic focus, conducting demographic-specific analyses, and exploring policy interactions. These advancements will not only enhance the rigor of fertility research but also inform the design of more effective and equitable policy interventions.

5.3. Policy Implications

The findings of this review provide critical insights for the design and implementation of fertility policies, emphasizing the need for specificity and actionable strategies tailored to regional and demographic contexts. Addressing the limitations of current approaches, this section outlines evidence-based recommendations to enhance policy effectiveness.

First, financial incentives must be tailored to the socioeconomic realities of tar-

get populations. Lump-sum subsidies, for example, have shown immediate but short-lived fertility increases, as evidenced by the Australian Baby Bonus. While these policies are effective at addressing short-term economic constraints, their impact tends to plateau over time. Policymakers should therefore prioritize subsidies as part of a broader, integrated strategy rather than a standalone measure. In low- and middle-income countries, such direct payments may have a greater impact on fertility due to widespread financial insecurity. In high-income countries, however, ongoing support mechanisms, such as tax credits and subsidized childcare, are more effective at addressing the sustained economic pressures faced by dual-income households and single parents.

The integration of multiple policy types has consistently demonstrated greater efficacy than single measures. Regions implementing combined approaches, such as childcare subsidies paired with lump-sum payments, reported up to a 40% greater increase in fertility rates compared to standalone interventions. The Nordic model serves as an exemplary framework, where policies integrate direct financial support, accessible childcare, and flexible parental leave. Policymakers should replicate this approach by designing multi-dimensional strategies that align with regional economic and cultural conditions.

The longevity of fertility policies is crucial for achieving sustained impacts. Short-term measures, such as lump-sum payments or temporary tax benefits, often fail to produce lasting behavioral changes. To address the dual challenges of short-term economic relief and long-term structural support, policymakers must balance immediate interventions like direct cash benefits with sustainable solutions such as childcare infrastructure and parental leave policies. Immediate interventions, such as the Australian Baby Bonus, can provide short-term financial relief and encourage a temporary rise in birth rates. However, as demonstrated by the eventual plateau of birth rates in Australia, such measures often lack the longevity required to address the deeper socio-economic barriers to childbearing. In contrast, sustainable solutions such as Norway's subsidized childcare system have proven to yield consistent long-term results. By reducing both the financial and logistical burdens of raising children, these policies allow parents, particularly working mothers, to balance career aspirations with family expansion. Combining immediate financial support, like one-time payments at childbirth, with sustained investments in childcare infrastructure creates a comprehensive policy framework. This integrated approach not only addresses the immediate financial challenges faced by families but also fosters an environment conducive to long-term fertility growth.

Instead, sustained investments in long-term policies—such as high-quality, affordable childcare and generous parental leave—can create an enabling environment for families to expand. For instance, subsidized childcare in Norway has been associated with a steady increase in second and third births, highlighting its enduring influence on fertility behaviors.

Monitoring and evaluation frameworks must be built into policy implementa-

tion to ensure adaptability. Governments should develop systems to track real-time fertility trends, cost-effectiveness, and demographic shifts in response to interventions. For example, tax credit reforms in the U.S. revealed differential impacts across income levels and racial groups, underscoring the importance of demographic-specific evaluations. Adaptive strategies, informed by continuous monitoring, can help policymakers refine interventions to meet evolving needs.

Finally, policies must address structural barriers beyond financial constraints. Fertility incentives alone cannot overcome challenges such as workplace rigidity, gender inequities in caregiving responsibilities, and cultural norms that disincentivize childbearing. Incorporating workplace reforms, such as flexible scheduling and enhanced parental leave, into fertility policies can reduce opportunity costs for families. Similarly, targeted campaigns to normalize shared caregiving roles may amplify the effects of financial incentives.

In conclusion, actionable policy implications must prioritize region-specific customization, integrate multi-policy frameworks, ensure sustained investments, and incorporate robust monitoring systems. By addressing the broader socio-economic and cultural barriers to fertility, policymakers can design more effective and equitable interventions that respond to the diverse needs of families globally.

6. Conclusion

In conclusion, financial incentives can influence fertility rates, but their effectiveness varies depending on the design, context, and integration with broader socio-economic support systems. Short-term measures like lump-sum payments may provide immediate boosts in birth rates but often lack sustainability. In contrast, comprehensive policies that include subsidized childcare, paid parental leave, and flexible working conditions tend to have more enduring positive impacts on fertility rates.

However, the success of these policies is not universal. The effectiveness of financial incentives varies significantly depending on how they are structured and the socio-economic context in which they are implemented. Short-term measures like lump-sum payments, while initially successful in increasing birth rates, often fail to sustain long-term fertility growth due to diminishing marginal returns. On the other hand, more comprehensive approaches that include subsidized childcare, paid parental leave, and flexible working conditions tend to have more sustainable impacts, as they address the broader economic and social challenges associated with child-rearing.

The findings from this study highlight the importance of a holistic approach to fertility policy. Governments must recognize that while financial incentives are a crucial component, they are most effective when combined with supportive measures that reduce the opportunity costs of having children. This includes investments in childcare infrastructure, parental leave policies, and workplace flexibility, all of which help create an environment where families can thrive.

Moreover, the long-term sustainability of these policies requires continuous

evaluation and adaptation. As socio-economic conditions evolve, so too must the policies designed to support fertility. Regular assessments can help policymakers identify which measures are successful and which require modification, ensuring that the policies remain relevant and effective.

In conclusion, while financial incentives can play a significant role in influencing fertility rates, their success depends on thoughtful design, integration with broader support systems, and a commitment to long-term sustainability. As governments around the world grapple with the challenges of declining fertility rates, a comprehensive and adaptive approach will be essential to fostering higher birth rates and ensuring the economic and social well-being of future generations.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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