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WHY IS FERTILITY SO LOW IN HIGH INCOME COUNTRIES?

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ABSTRACT

We consider why fertility has fallen in recent decades in almost all high-income countries. We begin by documenting declining total fertility and rising childlessness across cohorts, highlighting the need to focus on cohort versus period-specific fertility rates. With this motivation, we propose a conceptual model of fertility determination that augments the standard Becker model with an explicit role for social norms and cohort-specific contextual factors, including broad social and economic influences and an expanded set of consumption and lifestyle options. We posit that these forces have led to "shifting priorities," reducing the centrality of parenthood. We then review existing empirical evidence –and conclude that the decline in fertility likely reflects a complex mix of changing norms around work, parenting, gender roles, and leisure consistent with our cohort-based conceptual framework. We conclude with suggestions for future research and a brief discussion of policy implications.

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I. INTRODUCTION

Across high-income countries — and increasingly elsewhere – birth rates have fallen to historically low levels. Total fertility rates (TFR) are now below replacement rate in nearly all OECD countries, with many experiencing sustained fertility rates below 1.5, including Japan, Canada, Greece, and Italy. Some countries in East Asia, including South Korea, Singapore, and China, now have a TFR at or below one.

Such low fertility rates have far-reaching economic and social implications, with effects on population aging and declining population growth, labor force composition, economic dynamism, and the fiscal balance of social insurance systems. They also invite broader questions about what depopulation would mean for the climate, for living standards, and more generally for the welfare of humanity (Spears and Geruso 2025). In response, there is widespread interest in the question of *why* fertility rates have fallen so precipitously and so universally. We take up that question in this discussion paper.

We argue that the broad-based decline in fertility across the industrialized world—reflected in both higher childlessness and lower completed fertility—is less a response to period-specific costs or policies than a widespread de-prioritization of parenthood in people's adult lives. This de-prioritization reflects a complex interplay of changing norms around work, parenting, gender roles, and leisure, shaped by evolving social and economic influences and an expanded set of non-child activities and consumption. We refer to this set of dynamics as "shifting priorities." It does not reflect a simple change in preferences or a direct response to prices or constraints, but rather a deeper transformation in how successive cohorts are choosing to orient their lives.

The paper proceeds as follows. Section II documents fertility trends across high-income countries, highlighting the importance of observing fertility outcomes across cohorts of women rather than period-specific fertility rates. Viewing fertility through a cohort lens – an approach long emphasized by demographers – makes clear that a delay in childbearing and a rise in childlessness across the lifecycle is driving down rates of completed fertility across cohorts. We also present cohort-level data showing a decline in age-specific marriage rates across cohorts.

Section III puts forward a conceptual model of individual fertility choice that rationalizes shifting priorities across cohorts. Building on Becker's seminal framework, which emphasizes prices, income, and opportunity costs, our model explicitly allows for cohort-specific social and economic contexts to shape norms around work, parenting, gender roles, and leisure in ways that affect how young adults decide to allocate their time and money across parenting and non-parenting pursuits. As social and economic contexts evolve, the way new cohorts of young adults prioritize their allocation of time, money, and energy across child-oriented and non-child-oriented activities shift.

Sections IV and V review empirical evidence about the role of potential explanatory factors guided by this conceptual framework. Section IV considers the role of social norms around parenting, work, gender roles, and leisure and other broad contextual factors. Section V describes the evidence about the role of economic opportunities and constraints, including family income, child-related prices and costs, labor market and family policies, women's employment and earnings, and housing costs, wealth, and ownership. The evidence across these domains points to

broad cohort-level contextual changes rather than shifts in period-specific costs, policies, or economic conditions as key drivers of fertility decline.

Section VI addresses the fact that latent fertility choices do not necessarily translate into realized fertility. There are many reasons why those latent decisions might not match realized fertility, including frictions finding a desirable partner with similar views. Beyond that, when it comes to fertility, a woman might get pregnant when they do not want to or conversely, not be able to get pregnant when they would like to. We discuss the potential role of contraceptive access (to prevent unplanned pregnancies) and assisted reproduction therapies (to address infertility) in explaining recent trends in fertility.

The final section offers concluding observations for research and policy going forward. From a research perspective, we emphasize the need for economists to move beyond the typical focus on period-specific prices and income and instead explore the role of more widespread social and cultural influences across cohorts. From a policy perspective, the evidence suggests that governments are unlikely to substantially alter fertility patterns through modest cash transfers or incremental financial incentives. Fertility choices are more likely the result of long-term expectations and institutional arrangements, not transient policy shifts. A meaningful change in fertility rates is likely to happen only if the broader social and economic environment facing new cohorts evolves in ways that make parenthood a relatively more appealing and prioritized part of adult life.

II. PATTERNS IN PERIOD- AND COHORT-BASED MEASURES OF FERTILITY

Understanding fertility patterns requires distinguishing between two primary types of data measurement: period-specific and cohort-specific. Each approach offers distinct insights and limitations and provides valuable context for interpreting fertility behavior across demographic groups, time periods, and countries. In this discussion, we delve deeper into each concept, drawing on demographic theory, empirical data, and recent research.

A. Period-Specific Measures of Fertility

The General Fertility Rate (GFR) is one of the most straightforward metrics used in demographic analysis and it is commonly used in analyses of birth rates in the United States. Defined as the number of live births per 1,000 women in some age range (typically ages 15 to 44), it offers a snapshot of fertility in a given year. Its simplicity makes it highly practical, and it is readily available for the United States, as it is reported by the Centers for Disease Control and Prevention (CDC) and the National Center for Health Statistics (NCHS).

One of the major benefits of the GFR is that it can be easily disaggregated by demographic subgroup, allowing researchers to examine fertility behaviors across age groups, educational attainment, racial and ethnic categories, and nativity (whether a woman is native-born or foreign-born. In Kearney, Levine, and Pardue (2022), we present extensive data on the GFR in the US, showing that over the past two decades, the general fertility rate has fallen for all five-year age groups under age 30. There has been a dramatic, sustained decline in the US teen birth rate, which has fallen by roughly 70% since the early 1990s. In fact, in the US today, birth rates for women in their 40s are higher than birth rates among women ages 15 to 19 (Driscoll and

Hamilton 2025). Data on fertility rates in the US also reveal that women with lower educational attainment generally have higher GFRs, but that gap has narrowed in recent years. Hispanic women in the US have tended to have higher fertility rates than non-Hispanic White and Black women, but that gap has narrowed considerably, as the fertility rate of Hispanic women has plummeted.

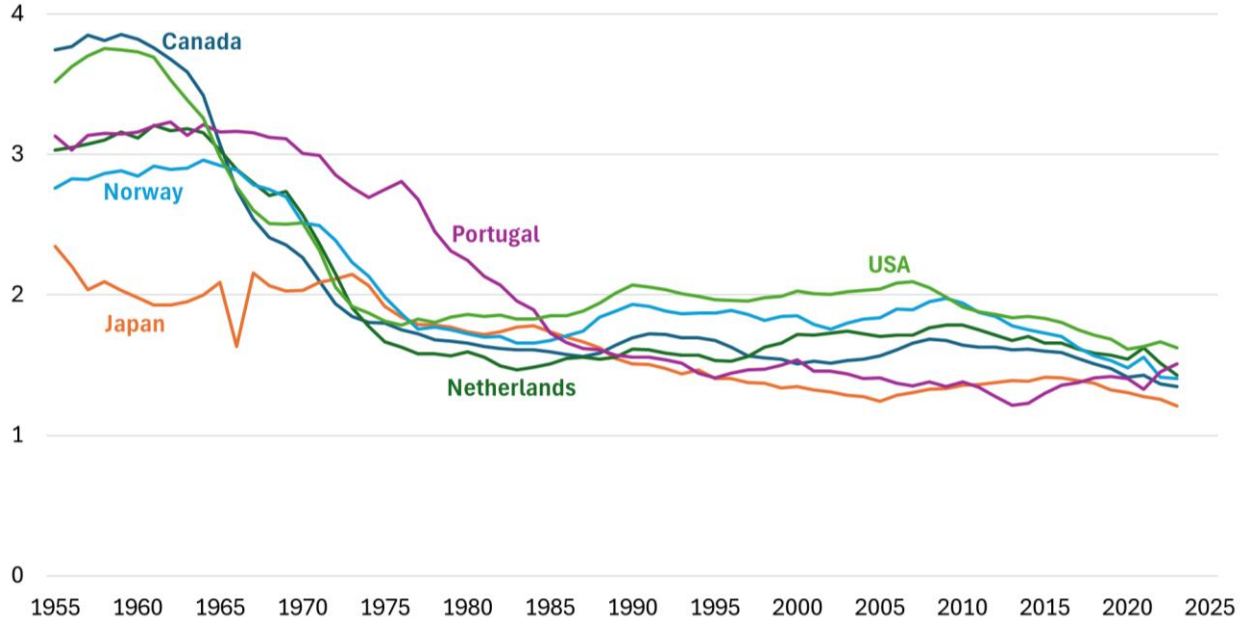
Despite the appeal of the GFR, its use is less common, and typically comparisons of fertility rates across countries rely on measures of the Total Fertility Rate (TFR). The Total Fertility Rate (TFR) is a synthetic measure that assumes women of different cohorts experience the same age-specific fertility rates observed in a specific period. It approximates the average number of children a woman would have over her childbearing years using current age-specific fertility rates observed in that period. The TFR It is a compelling and relevant statistic because a country with a TFR of 2.1 (approximately) is considered to be at replacement fertility, meaning that the native population "naturally" reproduces itself, allowing for some mortality of girls before they reach childbearing age. It is widely used by international organizations like the United Nations and the World Bank to compare fertility over time and across countries.

Figure 1 displays trends in the TFR since 1955 in six high-income countries: US, Canada, Japan, Netherlands, Norway, and Portugal. We chose to highlight these countries in large part because of the availability of data to construct both TFR and cohort measures of life-cycle fertility that we present below. This set of six countries offers the additional advantage of including two countries in North America, a country in East Asian, and three European countries. They represent a range of geographies, policy environments, and wealth levels within the broader categorization of higher-income countries. As can be seen in the figure, at the beginning part of this period, fertility was well above replacement level in all countries but Japan. This is the period well-known as the "baby boom" period and as can be seen, the TFR at the time was above 3 in the US, Canada, Portugal, and the Netherlands. Japan had the lowest birth rate among this set, already hovering around 2. (The large negative spike in births in Japan in1966 is widely attributed to the cultural belief that girls born during the "Fire Horse" year are likely to bring misfortune (Suzuki and Kashiwasi, 2019).

By 1980, the TFR in five out of these six countries (all but Portugal) dropped below replacement fertility. The TFR in Portugal fell below that mark a decade later. In the United States, the TFR rebounded to around replacement level by the early 1990s and hovered at that level until 2007. Since then, the US TFR has fallen steadily, and it is now at a lower level, more comparable to other high-income countries. Its TFR was 1.62 in 2023. Japan's TFR had fallen to a low of 1.20 by 2023. Our focus in this paper is this more recent decline in fertility – as opposed to the decline in fertility in the decades immediately following the baby boom of the mid-20th century.[1]

[1] There is no overarching consensus on the causes of the Baby Boom, but it is not very surprising that birth rates fell back to more typical rates in the 1960s and 1970s. There were dramatic changes in technology, the law, and other relevant institutional and cultural changes that occurred during those decades, including expanded access to contraception and abortion, women's economic opportunities and autonomy, that fundamentally altered the landscape of relationships and marriage. The post-1980 decline in fertility in Europe and the post-2000 decline in fertility in the US is, in our view, more of a puzzle.

Figure 1: Total Fertility Rates in Selected High-Income Countries

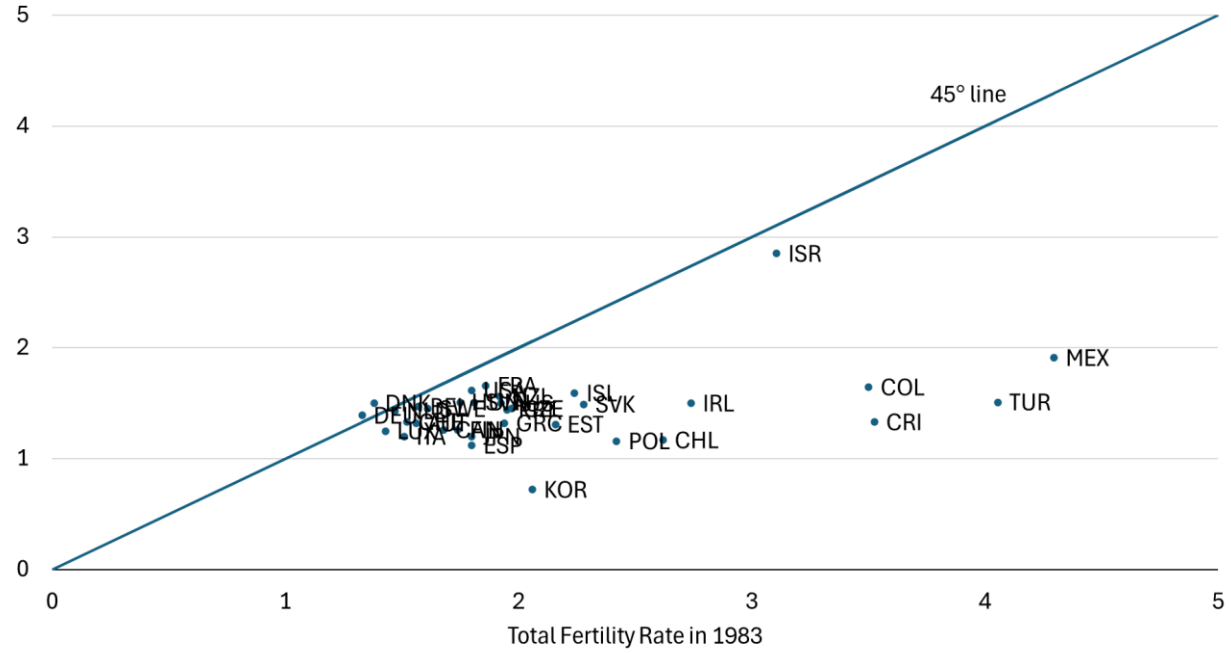


Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). "World Population Prospects 2024: Summary of Results" (UN DESA/POP/2024/TR/NO. 9).

Despite its widespread usage, the limitations of the TFR are well known. Chief among them is its sensitivity to changes in age-specific fertility rates for women in different birth cohorts. For instance, when women delay childbirth until older ages more so than earlier cohorts, they still may end up having the same number of children over their lives, but the TFR will temporarily dip, providing a misleading indicator of completed cohort fertility. Demographers refer to these timing issues using the term “tempo.” This is distinct from a drop in the total number of children women have over their childbearing years, which demographers refer to as “quantum.” These features of fertility are more reliably measured with cohort-specific measures of lifecycle fertility.

Before moving on to a more detailed examination of cohort fertility patterns in these countries, we document that a long-term decline in TFR is virtually uniform across the 34 OECD countries. Figure 2 plots the TFR in 2023 against the TFR in 1983 for each country, displaying a 45-degree line. The TFR fell in almost all countries over the period; Germany and Denmark are the exceptions, but the TFR in those countries was already under 1.5 by 1983. There has also been a convergence of the TFR to a level below 2 for almost all OECD countries, including Mexico and Turkey that had a TFR above 4 in the early 1980s. The downward trend in fertility is not specific to any subset of high-income countries.

Figure 2: Total Fertility Rates in 2023 Compared to 1983 in OECD Countries



B. Cohort-Specific Measure of Completed Fertility: Children Ever Born

While the period measures of GFR and TFR offer snapshots of fertility rates at specific points in time, cohort-specific measures track reproductive behavior over the life course of individuals from the same birth cohort. The Human Fertility Database (HFD) is a comprehensive repository of such data, developed through a collaboration between the Max Planck Institute for Demographic Research and the Vienna Institute of Demography. It provides detailed fertility outcomes for a range of countries, including those with long-standing population registries.

We use data from the Human Fertility Database to construct the measure *Children Ever Born* (CEB). The CEB measures the cumulative number of children an average woman in a given birth cohort has had by a specific age. This measure allows analysts to distinguish between quantum effects and tempo effects. For example, an observed decline in births to women under age 30 (as captured by the GFR) could indicate either a trend toward fewer children or it could reflect a postponement of childbearing to later ages. By tracking CEB over time and across age groups, we can distinguish these effects.

The problem with a reliance on CEB measures to track aggregate fertility trends is that constructing it requires that the cohorts of women being tracked have completed their childbearing years. Younger cohorts still have years to go to complete their fertility. This presents a trade-off between the necessary uncertainty around projections about likely completed fertility for cohorts still in their childbearing years and waiting until a cohort has completed their childbearing years to say anything about how fertility patterns are changing across cohorts.

As empirical economists, we believe there is considerable useful information available in cohort-level data from our selected countries to say something about how fertility is changing across

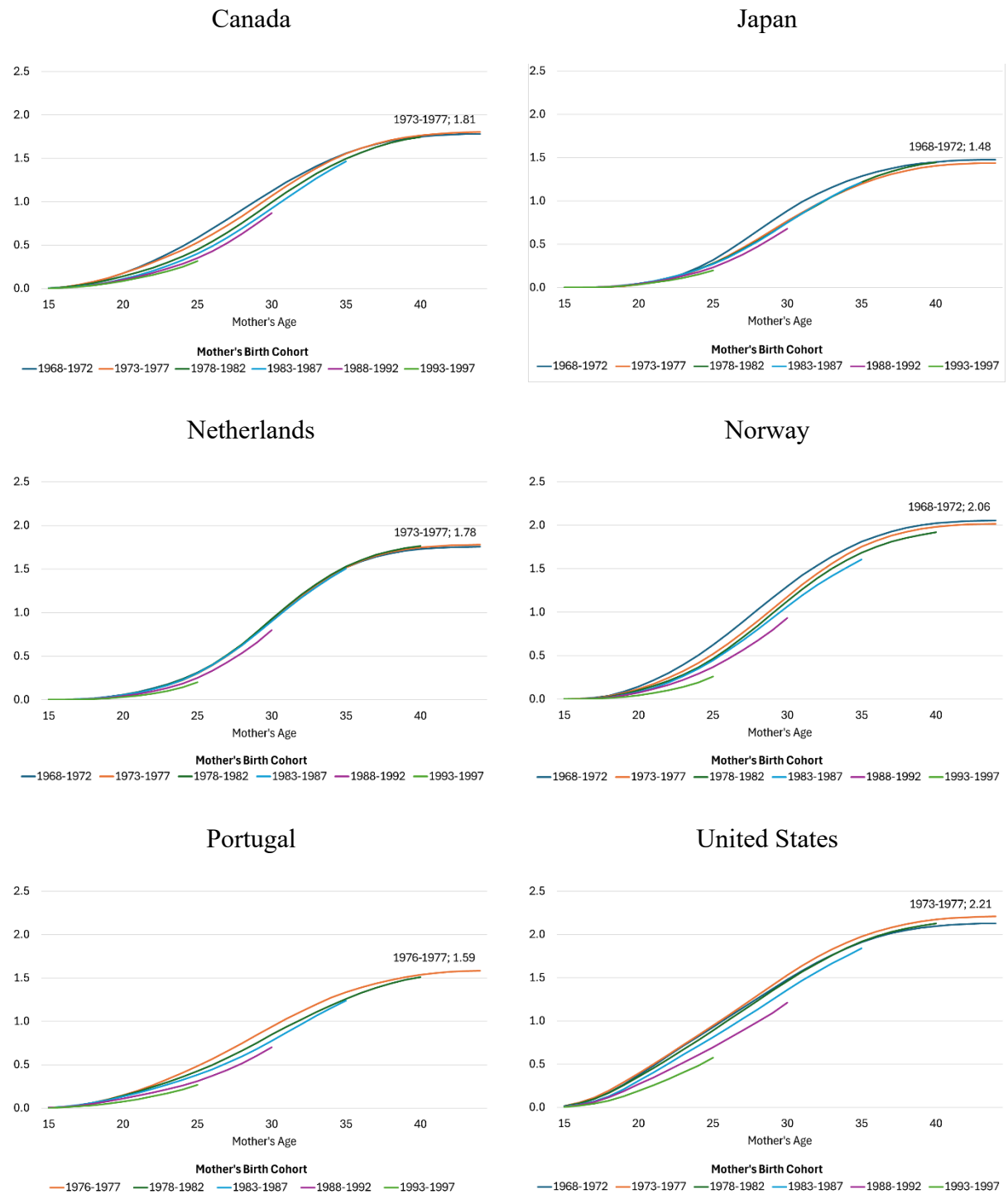
recent cohorts of women, even though some of these women are still of childbearing age. Figure 3 presents statistics on Children Ever Born (CEB) by age and birth cohort for our set of six countries. This figure reports cohorts of women born from the late 1960s through the mid-1990s (with the exception of Portugal, whose data isn't available until 1976; the 1973-1977 generalized label only reflects the last two years of that period for Portugal).

In each country over that period, CEB peaked among women in the late 1960s and early/mid 1970s birth cohorts. In the United States and Norway, these peaks were roughly at replacement levels. These women would have hit prime childbearing years roughly in the 1990s. That is consistent with the TFR in those countries during that period. In all other countries, though, these earlier cohorts of women did not hit replacement fertility. Japanese women in these earlier cohorts were an outlier even then, having around 1.5 children, on average.

A valuable feature of presenting data in this way is that it allows us to distinguish between delay (tempo effects) and reductions in total children ever born (quantum effects). We can see in these figures that among earlier birth cohorts, women in Canada, Japan, Norway, and Portugal delayed childbearing to older ages, but ultimately women in these cohorts had a similar number of children, on average, over their lifetimes.

As we move into the more recent cohorts born post 1987, who are only ages 25 or 30 in these data, their number of children ever born at a given age is even further behind that of earlier cohorts. By age 30, women have given birth to an average of 0.25 fewer children in most of these countries relative to the early cohorts. It seems unlikely that by age 44, these birth cohorts will have completed fertility on par with earlier cohorts or at replacement level. The biological constraint of childbearing means that delayed childbearing eventually turns into childlessness or fewer children ever born.

Figure 3: Children Ever Born, by Mother's Age and Birth Cohort



Source: Authors' calculations based on data from country-specific age-specific fertility rates available from the Human Fertility Database. Max Planck Institute for Demographic Research (Germany) and Vienna Institute of Demography (Austria). Available at www.humanfertility.org (data downloaded 4/15/2025).

C. Cohort-Specific Measures of Fertility: Childlessness and Higher Order Births

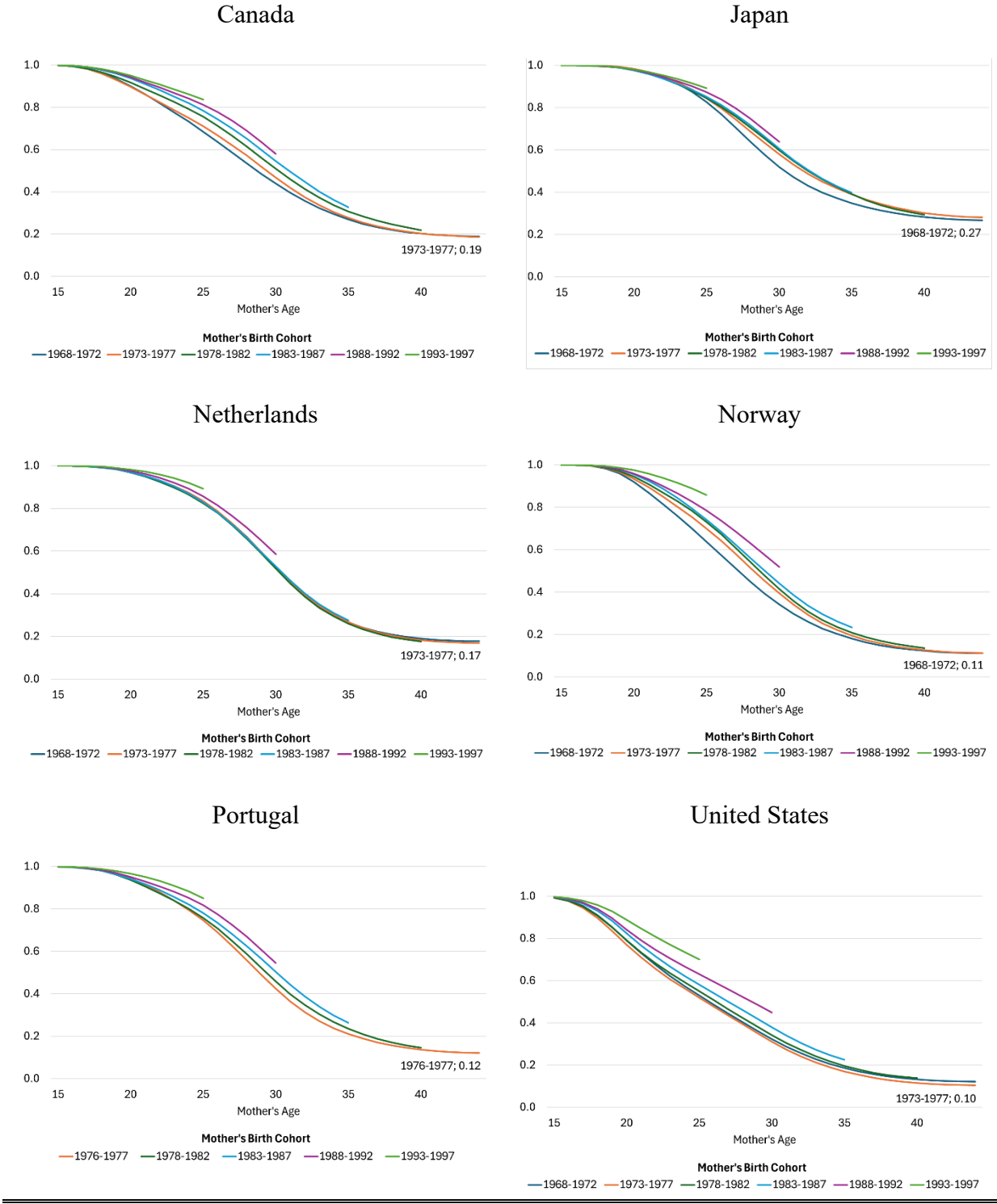
Childlessness is a key component of fertility behavior, and it is best examined through a cohort analysis. This reflects the extensive margin of fertility—whether women have children at all. The intensive margin of childbearing refers to the likelihood of higher order births among those who already have children.

Figure 4 shows rising childlessness in all these countries. By age 30, rates of childlessness have increased by 10 percent (Netherlands) to 50 percent (Norway) from the earliest cohorts to the most recent in which women are observed through that age. There is still time for women in these cohorts to close the gap, but the gap is large – and seemingly growing by cohort.

Figures 5 and 6 present empirical hazard rates of the likelihood of having a second or third birth at each age conditional on having one or two children already at that age. There are interesting comparisons of these patterns with those in Figure 3 regarding childlessness. For instance, Portugal and Japan have similar rates of children ever born for earlier cohorts that have completed their fertility, but far more women in Portugal have a first child. By the end of childbearing in earlier cohorts, only 12% remain childless compared to 27% in Japan. But women in Japan who have a child are more likely to go on and have more children than in Portugal. During their prime childbearing years, around 20% of Japanese women who already have had one child go on to have a second child each year. In Portugal, fewer than 10% do so. In the end, the two conflicting patterns balance to generate roughly the same level of children ever born.

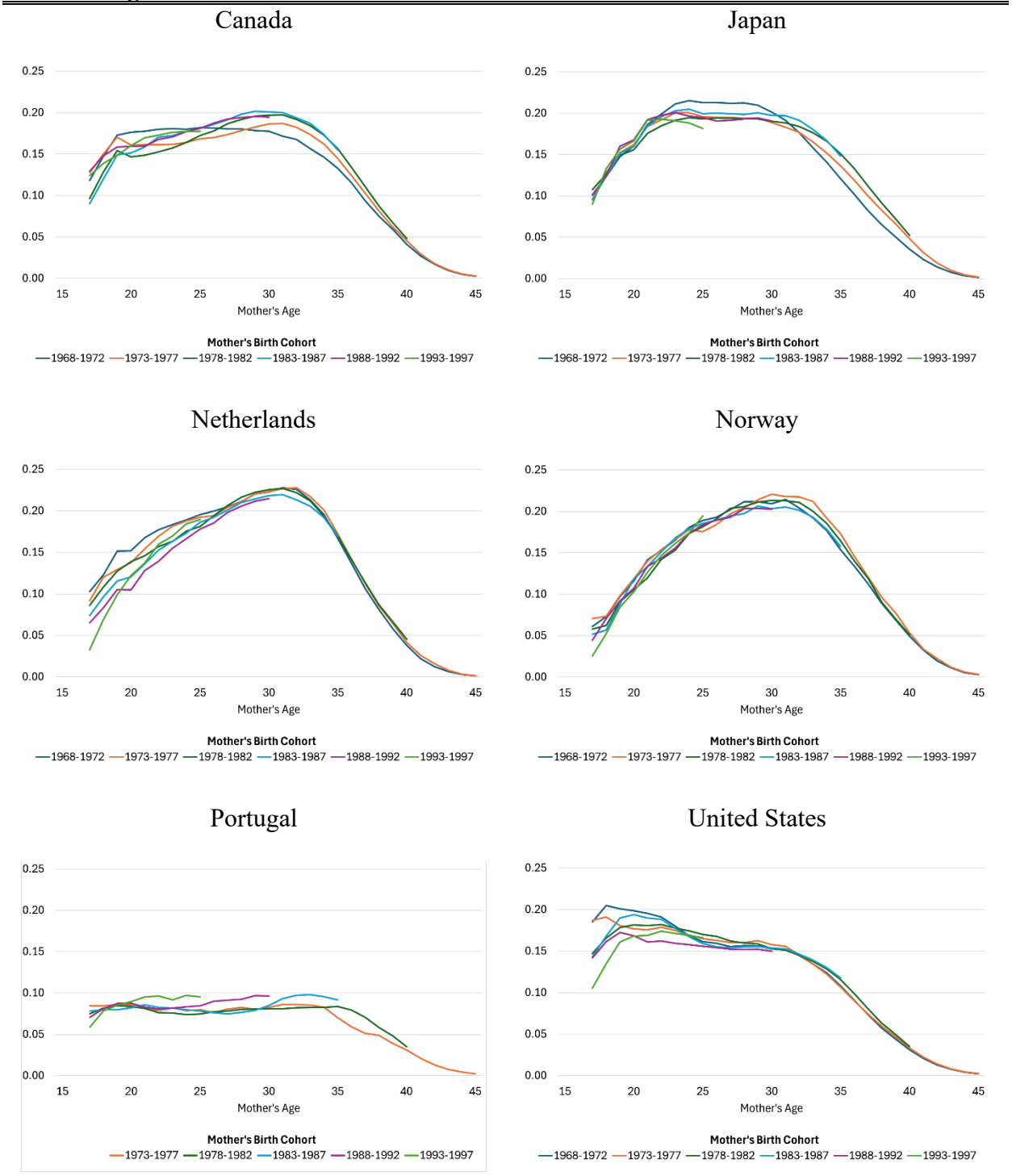
Beyond that, we see that once women have their first child, there is limited evidence that more recent cohorts are waiting longer to have higher order births. We can see in Figures 5 and 6 that across countries, for women in prime childbearing years (beyond teenage years) higher parity hazard rates by age are essentially unchanged across cohorts, with Canada perhaps being the only minor exception. In an accounting sense, these data provide an indication that entry into childbearing is likely playing a larger role in the observed delays in childbearing and potentially the overall reduction in children ever born among more recent cohorts of women. This complements a recent analysis by Geruso and Spears (2025), which shows that for earlier cohorts, both childlessness and a reduction in parity among those with children contributed to a decline in children ever born.

Figure 4: Percentage of Women with No Children, by Mother's Age and Birth Cohort



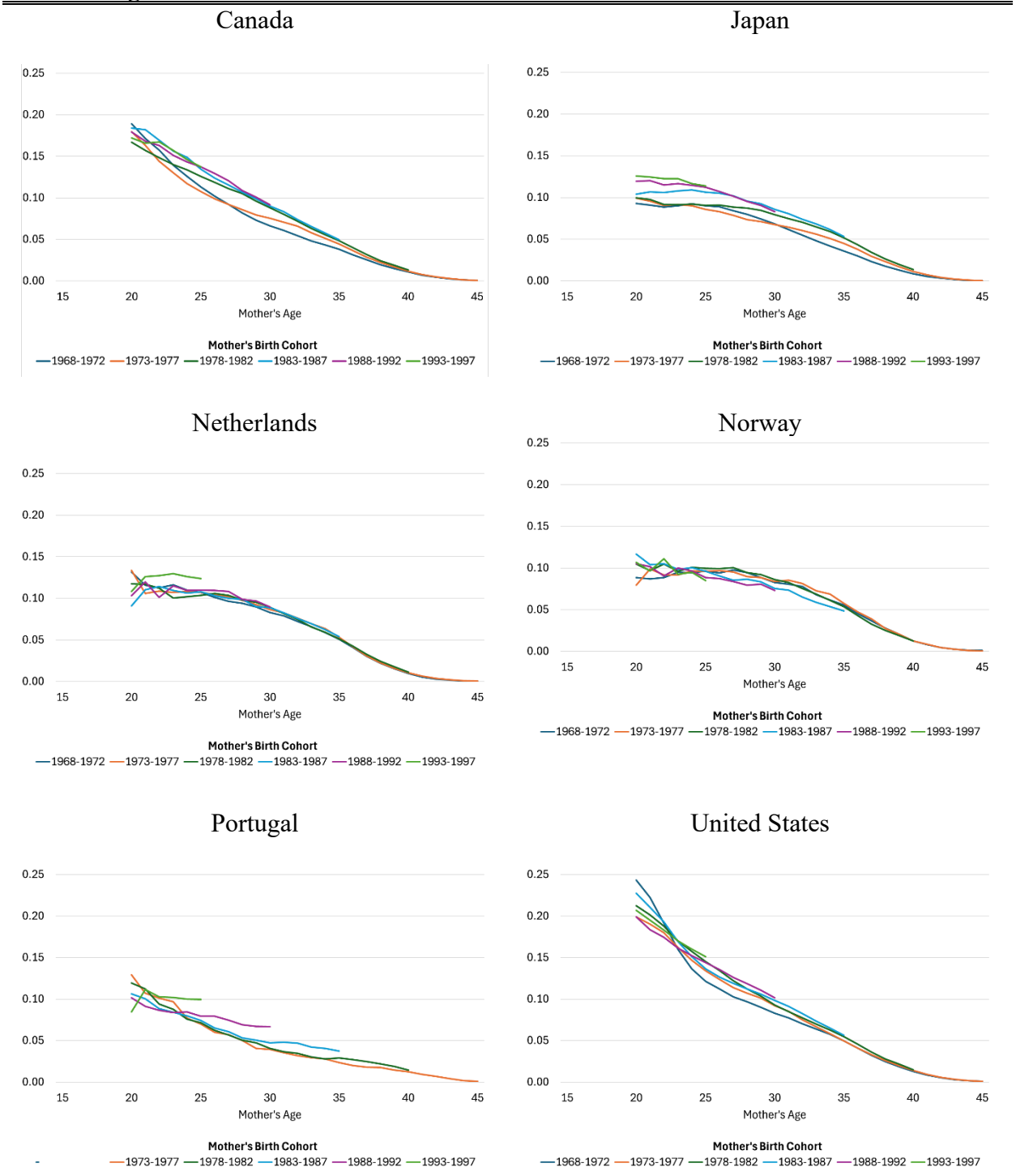
Source: Authors' calculations based on data from country-specific age-specific fertility rates available from the Human Fertility Database. Max Planck Institute for Demographic Research (Germany) and Vienna Institute of Demography (Austria). Available at www.humanfertility.org (data downloaded 4/15/2025).

Figure 5: Probability of Having a Second Child among Women with One Child, by Mother's Age and Birth Cohort



Source: Human Fertility Database. Max Planck Institute for Demographic Research (Germany) and Vienna Institute of Demography (Austria). Available at www.humanfertility.org (data downloaded 4/15/2025).

Figure 6: Probability of Having a Third Child among Women with Two Children, by Mother's Age and Birth Cohort



Source: Human Fertility Database. Max Planck Institute for Demographic Research (Germany) and Vienna Institute of Demography (Austria). Available at www.humanfertility.org (data downloaded 4/15/2025).

D. Marriage and Fertility

Marriage and fertility remain tightly linked, even in high-income countries today (Stone and James 2022). Within countries, married women have more children. Across countries, those with higher marriage rates have higher fertility rates. Though non-marital childbearing rates have increased, it is still lower than it is among married parents. This link is best interpreted as a correlation and is not necessarily causal. People tend to have children after marriage, but the inclination to marry is likely higher for people desiring to have children. The data reveal that as a descriptive matter, the decline in fertility in high-income countries corresponds to a decline in marriage.

Figure 7 plots the likelihood of remaining unmarried by women's age and birth cohort across countries. The data necessary to conduct this exercise is more limited than it is for fertility. For the countries we focus on in this paper, we were able to locate these data for the United States, Japan, and Netherlands. Across these countries, we see delayed and falling rates of marriage across cohorts, similar to the patterns observed in fertility across cohorts. Few women marry in their teens, and the likelihood of marriage rises through women's childbearing years. In each country, successive birth cohorts are more likely to remain unmarried at each age. Marriage rates among more recent cohorts may catch up as they advance through their childbearing years, but the gaps are large.

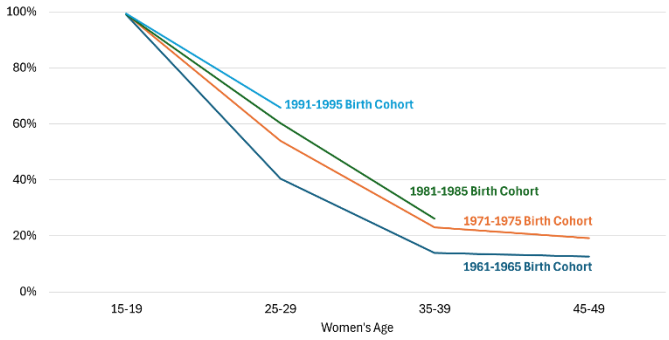
This correspondence between declining marriage and fertility has captured a great deal of attention in on-line and press discourse. For instance, Stone (2025) reports the results of a simple decomposition exercise showing that, in a mechanical sense, roughly three-quarters of the decline in fertility in the US since 2007 can be explained by a decline in marriage. Burn-Murdoch (2025) observes that the decline in birth rates corresponds to a decline in marriage and cohabitation in a wide range of countries. However, it is not clear what the causal relationship between these trends is.

There are plausible explanations that could generate a causal relationship between marriage and fertility in either direction. Perhaps marriage rates are falling because people are less committed to having children and thus find marriage less necessary or desirable. Or perhaps fertility is falling because people who would like to get married and have children within marriage are unable to find a suitable partner. These are pressing questions that require more research to answer.

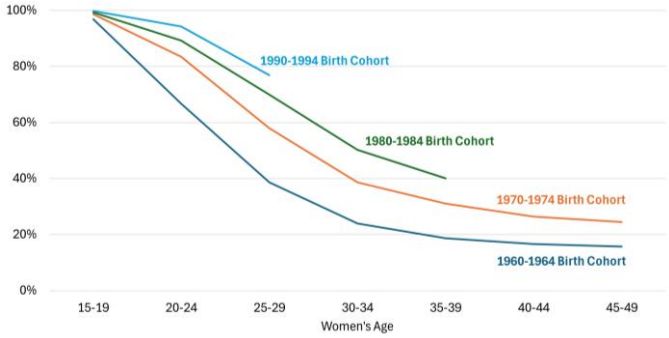
Another interesting question is the extent to which any link between the decline in marriage and the decline in fertility is reflective of social norms around having and raising children outside marriage. For instance, the norms against non-marital childbearing are much stronger in Asian countries than in Western countries. Consider the case of Japan, where in 2021, only 2.3 percent of births were outside marriage. Meanwhile, between 2000 and 2020, the share of women who had never been married by age 50 tripled, rising from 6 percent to 18 percent. Given a strong prevailing convention against non-marital childbearing in Japan, it would not be surprising if any exogenous factor driving a decline in marriage led to a decline in fertility. This is less likely to be true in places like France or the US, where approximately 60 and 40 percent of births are outside of marriage, respectively. Exploring the role of social norms in shaping the causal link from a decline in marriage to a decline in fertility would be a productive area for research inquiry.

Figure 7: Percentage of Never-Married Women, by Age and Birth Cohort

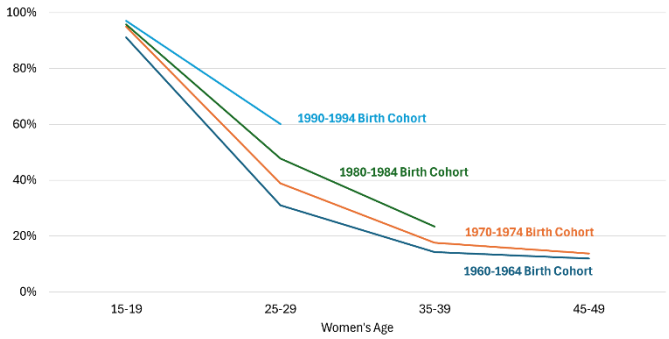
Japan



Netherlands



United States



Sources:
Japan: National Institute of Population and Social Security Research, *Population Statistics of Japan, 2023*. Available at: https://www.ipss.go.jp/p-info/e/psj2023/PSJ2023.asp
Netherlands: Statistics Netherlands (Centraal Bureau voor de Statistiek, or CBS). *Population; sex, age and marital status, January 1; 1950-2019*. Available at: https://opendata.cbs.nl/#/CBS/en/dataset/7461eng/table
United States: UNECE Statistical Database, available at: https://w3.unece.org/PXWeb2015/pxweb/en/STAT/STAT__30

E. Takeaways

A key point made in this section is that understanding the recent decline in fertility requires a focus on understanding changes in fertility across cohorts. The data presented in this section also specifically reveals the practical importance of a rise in childlessness at observed ages in driving the recent decline in fertility. The need to examine cohort patterns of fertility to meaningfully understand fertility trends has long been recognized by demographers (see, for instance, Bongaarts and Feeney 1998 and Frejka and Calot 2001). However, as will become clear below, economists' empirical strategies within the context of modern economies are more typically targeted at tracking changes in behavior at a point in time or perhaps within women's lifetimes. They are often better suited to investigating the impact of period-specific factors on period-specific fertility rates. This disconnect provides an opportunity for modeling developments and for new empirical research into the causes of the decline in fertility across cohorts.

III. CONCEPTUAL CONSIDERATIONS

The preceding discussion motivates the need for a framework for modeling fertility behavior that can account for large shifts in fertility outcomes across recent cohorts. In this section we propose a conceptual model of fertility determination that explicitly allows for changing contextual factors and expanding choice sets across cohorts. This approach builds on a hypothesis we put forward in previous work (Kearney, Levine, and Pardue, 2022), speculating that the widespread reduction in fertility across recent cohorts reflected shifting priorities.

A. Economic Framework: Fertility Choice That Yields Shifting Priorities Across Cohorts

Beginning with the seminal work of Becker (1960), economic models of fertility determination have emphasized the role of family income, child-directed prices, and the opportunity cost of women's time as drivers of the demand for children. This standard neoclassical model of fertility determination assumes static preferences and models the demand for children in a constrained optimization framework. Becker and Lewis (1973) incorporated a quality/quantity trade-off with regard to the demand for number of children into this standard framework to explain the empirical regularity of declining fertility as societies got richer. The tradeoff between quality and quantity, which emphasized improvements in the health and education of children, is less relevant to understanding declines in fertility in the modern era than it was in the past, as observed by Doepke et al. (2023). We thus propose a new extension that can rationalize shifting priorities away from parenthood in the late 20th century/early 21st century in high-income countries.

We augment the standard neoclassical model with the explicit recognition that cohort or group level contextual factors and choice sets affect the demand for children. Our proposed framework recognizes that an individual's demand for children is not simply a reflection of fixed personal preference or a straightforward response to prices and income but also reflects the set of available options to choose from and endogenously evolving social norms around those options.

1. Basic set-up

Formally, we consider the choice over the number of children n of an individual i in cohort t. We deliberately abstract away from the question of whether the individual making the choice is

acting as an individual agent, a person with a spouse or partner with identical preferences and parameters, or a couple that has bargained to consensus over the fertility problem. (In our review of empirical evidence below, we discuss the issue of couple disagreement over fertility desires.)

For simplicity, we consider a two-cohort set up. Let an individual in cohort $t \in \{1,2\}$ maximize:

$$U_t = U(C_t, n_t, \boldsymbol{\theta_t}, \boldsymbol{\gamma_t})$$

subject to the budget and time constraints:

$$p_t^c C_t + p_t^n n_t = Y_t, \qquad T_t^c + T_t^n = \bar{T}$$

In this set up, n_t is the number of children and C_t is a composite index of non-child consumption and activities, and $\boldsymbol{\theta_t}$ captures the influence of prevailing social norms, and $\boldsymbol{\gamma_t}$ captures the influence of broad social influences and economic conditions that vary across cohorts. Social norms are understood to evolve endogenously with choices – though we leave any attempt to formalize that endogeneity to future work – while social and economic influences ($\boldsymbol{\gamma_t}$) mostly change exogenously across cohorts. Both C and n are produced with combinations of time (T^c and T^n) and purchased goods (X^c and X^n), such that $C = C(X^c, T^c)$, and $n = n(X^n, T^n)$. The terms p_t^c and p_t^n capture the relevant prices, which can vary across cohorts; Y_t represents total resources for an individual in cohort t; and $\bar{T}$ reflects total time available.

This setup is intended to generate predictions across cohorts, while incorporating the standard predictions of the Becker model of fertility choice. All else equal, increases in the relative price of child-directed goods and activities (captured by p_t^c relative to p_t^n) are expected to reduce the demand for children. Increases in household resources Y_t are predicted to increase the demand for children. In the remainder of this conceptual discussion, we focus on more novel cohort-level factors. In our review of empirical evidence below, we consider both typical price and income factors as well as broader contextual factors.

2. An expanded choice set

One potentially important reason why that $U_t(\cdot)$ might change across cohorts is an expansion of feasible and valued alternatives to parenthood. In this cohort-oriented model. We allow this set of options to expand across cohorts such that

$$C_2 = C_1 \cup \Delta C,$$

where ΔC represents consumption and lifestyle options that are only available or widely socially acceptable for the later cohort. For instance, among more recent cohorts of adults, there has been a rise in the availability and social acceptability of consumption-oriented lifestyles emphasizing leisure and travel. There has also been a proliferation of digital media, high-quality gaming, on-line pornography, social networks, and self-development, among other non-child (and more generally, non-family) centered adult activities. (Alternatively, one could model the expansion of the feasible choice set as a reduction in the price of alternative pursuits, with some previously having an infinite price.) These new choice elements may enter the utility function directly –

because they provide intrinsic satisfaction – or indirectly – because they generate social status, identity, or belonging.

The expansion of feasible and valued alternatives to parenthood increases the marginal utility of time and resources spent on non-child activities. Consequently, as the consumption choice set broadens, the opportunity cost of children rises because time and resources devoted to children requires foregoing an increasingly diverse set of other valued pursuits. When viewed through this lens, it is clear the reduction in fertility across recent cohorts need not imply a change in preferences toward children per se; rather, it could reflect a substitution effect within a larger and more socially sanctioned set of options.

In this framework, the fertility response to an expanded choice set depends critically on the elasticity of substitution between children and alternative uses of time and income. The stronger the substitutability between $C$and n,—meaning the greater degree to which adults can derive more comparable satisfaction, identity, or purpose from non-family activities –the stronger the substitution away from childbearing in response to the introduction of new options in ΔC. Conceptually, this notion is related to the explanation put forward by Aguiar et al. (2021) regarding the decline in labor supply among young men. They propose that improvements in video gaming technology have increased the value of leisure time, leading young men to shift their hours away from work toward recreational gaming.

3. Contextual factors

The elasticity of substitution across consumption options also varies with prevailing social norms ($\boldsymbol{\theta}_t$) and external social and economic contextual factors that shape choices ($\boldsymbol{\gamma}_t$). The relevant social norms that we highlight include those around work, parenting, gender roles, and leisure. We conceptually separate out the role of norms – which are endogenous to choices – and social and economic influences that are more likely to be exogenous to individual choices. For example, the introduction of email, the iPhone, and social media were exogenous shocks that changed major facets of work and socializing across cohorts. Economic conditions that have changed across cohorts, such as rising inequality and deindustrialization, have also affected the perceived net benefits of having children versus pursuing other activities. These external influences affect choices both directly and indirectly through their role in shaping norms.

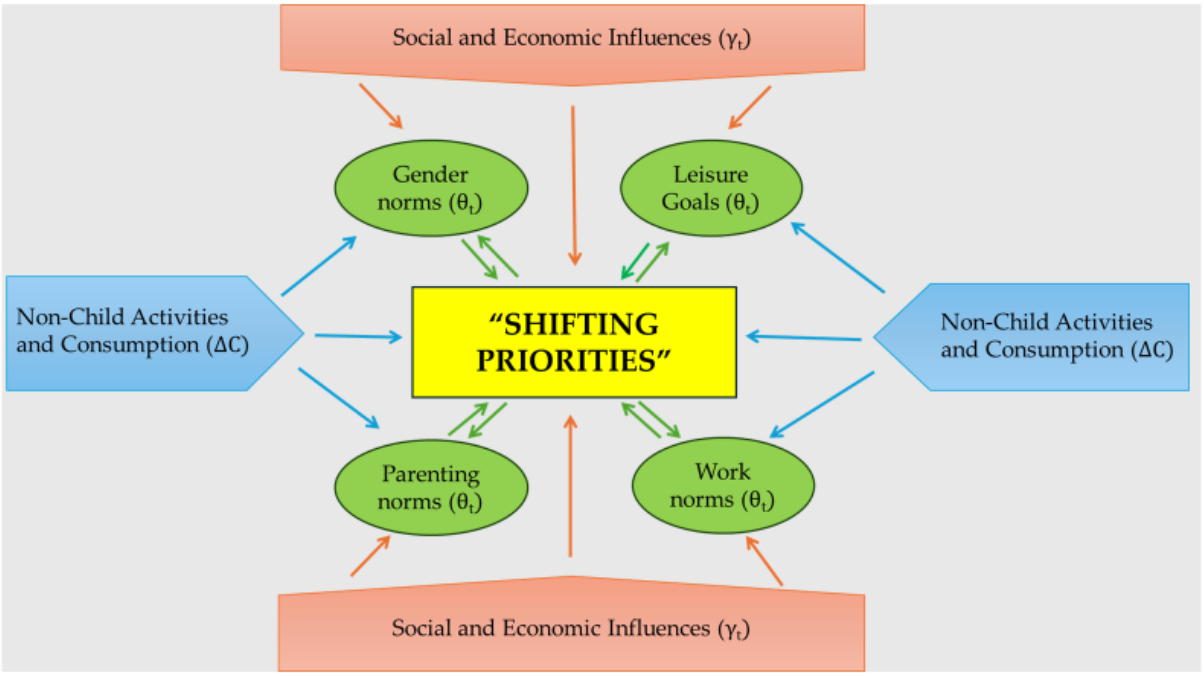
B. An Equilibrium Outcome of "Shifting Priorities"

As more people choose alternatives to parenthood and a child-focused life, society increasingly comes to be characterized by smaller families and an increase in childlessness, and social norms endogenously evolve. This can lead to contagion or multiplier effects that establish and solidify new norms around work, parenting, gender roles, and leisure. These norms then affect the elasticity of substitution between children and non-child pursuits, enhancing the shift in priorities, such that parenthood is further deprioritized against other uses of time and resources.

Figure 8 presents a visual depiction of these concepts and the evolution of shifting priorities. In this conceptualization of fertility choice, the observed fertility decline across cohorts can be understood as an equilibrium outcome of the prevailing economy and culture. A general equilibrium feedback arises through the evolution of norms and expectations. The social meaning

of adulthood, partnership, and fulfillment shifts: choosing not to have children – or delaying parenthood – becomes increasingly accepted, perhaps even aspirational. In this sense, the fertility decline that has occurred across cohorts as non-family alternatives have proliferated is not simply a response to prices or constraints, but an equilibrium cultural adjustment. The model thus helps explain both the persistence and social diffusion of fertility decline in advanced economies.

Figure 8: Pathways to a Social Equilibrium of Shifting Priorities



Our concept of shifting priorities embeds all these influences. Priorities toward childbearing may change across cohorts because of greater availability and social acceptability of non-child activities and consumption (an expansion of the choice set). They may also shift in response to changes in the social and economic environment that individuals and families face (γ). Both sets of influences directly affect choices and indirectly by altering social norms (θ) regarding parenting, work, gender roles, and leisure.

They are shaped by cohort level social and economic factors, along with an expanded set of non-family consumption alternatives. These broader contextual factors can also have a direct impact on shifting priorities by affecting the perceived net benefit (and therefore marginal utility) of various pursuits. Period-specific prices and income always exist in the background, directly affecting fertility choice.

The various influences identified in the diagram produce an equilibrium of "shifting priorities" across cohorts. Across recent cohorts, we have seen outcomes consistent with individuals placing relatively less weight on parenthood and more on other domains of identity and fulfillment. This dynamic captures how fertility decline can emerge not merely as a response to prices and

income, but as the product of evolving choices and social and economic contexts that affect norms and the relative ranking of various options.

C. Additional Considerations

In this section we present some additional considerations related to the framework presented above.

1. Within versus across cohorts

Our focus on explaining declining fertility across cohorts has led us to focus on cohort specific factors, captured by $\boldsymbol{\theta_t}$, $\boldsymbol{\gamma_t}$, and ΔC. But our proposed model allows for standard effects within a cohort, or within a woman's lifetime. To be sure, the economics of fertility literature includes many important contributions considering the dynamics of fertility choice determination within one's life (cf. Hotz, Klerman, and Willis, 1997).

In terms of explaining shifts across cohorts, period-specific changes are likely to have a smaller impact than broader changes in the social and economic context within which decisions are made at the start of their adult years. A change in the availability of a child tax credit, for instance, when a woman is 30 years old could affect whether she goes on to have a child or another child after that age. But a change in the prevailing social and economic context that a woman faces at age 20, when she is making lifetime decisions about education, a career path, and family formation goals, is likely to have a much larger effect on her completed fertility. As others have observed, there is a path-dependence to such decisions that shape lifetime fertility (Adda, Dustmann, and Stevens, 2017).

2. Patterns across places and different groups

The model as presented is focused on explaining cohort trends in fertility. We use the label, $t \in \{1,2\}$, to distinguish between successive birth cohorts. But this modeling approach could just as readily be applied to different places, instead of different cohorts. For instance, we could add a term $g \in \{1,2\}$, where g indexes geographic locations and allow for different social and economic contexts across places.

This extension goes beyond the scope of the paper, but it is noteworthy that it can potentially be applied to the variation in fertility rates across locations. For instance, Israel routinely tops the list and South Korea shows up at the bottom in international comparisons (see Figure 2). This framework could be used to consider features that would explain those large geographic differences. It could also be used to consider variation within countries, like those that exist between urban and rural areas (see Ely and Hamilton, 2019, for evidence from the United States), or the growing divide in the US between people with different reported political affiliations. For instance, Dahl, Lu, and Mullins (2022) document higher birth rates in Republican relative to Democratic districts following the 2017 election of Donald Trump, potentially explained by differences in economic optimism or pessimism.

Furthermore, the model could be easily extended to allow for differential trends in fertility across cohorts among different demographic groups. For instance, one could imagine that individuals

with higher education and earnings potential face both a higher shadow price of time and greater access to the goods and experiences that comprise ΔC—international travel, leisure consumption, or career advancement, for instance. For these groups, the opportunity cost of childrearing rises steeply, amplifying the substitution effect. Certainly, there are elements of the expanding set of choices that are more broadly available, like social media or video games, so this need not be the case, but it could be explicitly modeled, and future work could empirically explore such heterogeneity.

3. The role of social interaction

A focus on behaviors across groups would bring into focus the specific issue of how group norms affect fertility, as in the model of social distance and social conformity put forward in Akerlof (1997). Such effects can also lead to dynamic effects: a reduction in fertility among members of one's reference group can influence their decision to become a parent, both through the establishment of norms, which shape preferences, but also through a direct effect on costs and benefits. For instance, whether the members of one's peer group are having children or multiple children will affect whether one's peers are available to help with or share in child-oriented activities versus engaging in child-free adult activities. One recent paper finds that workers who are exposed to reduced fertility among their coworkers have fewer births themselves (De Paola et al. 2024). This possibility of peer effects amplifying individual choices and leading to a dynamic decline in aggregate fertility rates should be explored in future research.

4. Low and declining fertility isn't necessarily an absorbing state

This model does not imply that shifting priorities across cohorts will continue to lead to a de-prioritization of parenthood across future cohorts. As documented in section II, more recent cohorts have chosen to have fewer children and remain childless at higher rates than past cohorts. But it is possible that subsequent cohorts will choose to re-prioritize parenthood, even with the availability of an expanded set of choices. This could happen if, for instance, the aging of these lower-fertility cohorts is associated with increased social isolation and diminished life satisfaction. This could lead subsequent cohorts to alter their views in ways that lead to further changes in norms, and a new equilibrium in which parenthood again plays a more central role.

In this way, the predictions of our model depart from those of the Second Demographic Transition (SDT) theory proposed by demographers Lesthaeghe and Van de Kaa (1986). The SDT posits that following the first demographic transition—marked by declining mortality and fertility—advanced societies entered a new stage characterized by persistently below-replacement fertility, delayed marriage and childbearing, increased cohabitation, higher divorce rates, and more diverse family forms. These changes are attributed to a broad cultural shift emphasizing individual autonomy, self-realization, gender equality, and secularization. The SDT is generally interpreted as implying that as societies become more developed and individualistic, fertility remains low because underlying values and preferences have permanently changed (Zaidi and Morgan 2017). Our framework interprets shifting norms not as permanent shifts, but rather as adaptive responses to social and economic contexts.

5. Endogenous preference formation

Though outside the scope of the framework we have laid out above, the possibility that individual preferences toward fertility evolve endogenously with childbearing is something that needs to be taken seriously. It is also important to grapple with when considering the welfare consequences of declining fertility. Having a child is a transformative experience that cannot be properly anticipated before being experienced (Paul 2014). That implies that the utility associated with parenthood is subject to ex ante incomplete information. This raises the possibility that people are making rational choices to restrict their fertility to avoid subsequent costs, like potential career consequences or limited leisure time, but the rationality of this choice is conditional on a pre-choice utility function that would not hold in the presence of children. The possibility, even likelihood, of endogenous utility and preference ranking complicates welfare analysis and standard choice modeling. A thorough consideration of this possibility is outside the scope of this paper, but this is an area ripe for further exploration.

D. Survey Evidence on Shifting Priorities

In the next two sections we provide a detailed review of the empirical evidence on the effect of various factors that may lead to what we have referred to as a shift away from the prioritization of childbearing: social norms, social influences, and economic contexts. Before we do that, though, here we mention some descriptive survey data from the United States and other high-income countries that support the general idea that parenthood is no longer viewed as central for adult happiness. (We do not know of comparable survey data from previous decades.) To be clear, these survey data findings are not intended to be dispositive, but they are descriptively consistent with the notion of shifting priorities.

In a Pew Research Center survey conducted in 2023, only about one-in-four US adults say having children (26%) or being married (23%) is extremely or very important to live a fulfilling life. Many more say that having a job or career they enjoy is extremely or very important (71%) and having close friends is extremely or very important (61%) (Parker and Minkin 2023). A survey of South Korean adults between ages 20 and 49 also finds that the majority place greater importance on their careers than on marriage or having children (Jung 2025). Similarly in Canada, a recent national poll found that people report having an enjoyable career being more important to leading a fulfilling life than having children (Ipsos 2024).

In terms of the reasons childless adults give for not having children, many indicate that it was a choice. In the United States, among childless adults under age 40 in 2012, 60% said they “just don’t want to have kids” (Brown 2021). A 2018 survey of U.S. adults who reported not wanting children or being unsure, the leading reason cited was a desire to “have more leisure time” (Miller 2018). A survey of unmarried Japanese men and women without children conducted in 2025 found that only 40% of respondents in their twenties would like to have children (Nippon 2025). In the Netherlands the majority of childless women indicated that children don’t fit their lifestyle (Lubbe 2024).

IV. EVIDENCE ON THE ROLE OF SOCIAL NORMS AND CONTEXTUAL FACTORS

In this section we describe empirical evidence about the role of various social norms and contextual factors. This is not meant to be an exhaustive consideration of all norms and contextual factors that might fit into the above framework of shifting priorities. Rather, it is intended as a discussion of existing evidence about the role of factors that fit more clearly in this categorization of explanations, as opposed to the more standard focus on prices, income, and opportunity costs.

A. Evolving Norms Around Parenting

A widespread societal change in recent decades that may have contributed, and continue to contribute, to young adults' views about having children is that parenting has become much more resource- and time-intensive, both in the United States, as well as in many other high-income countries. This trend toward more time-intensive parenting is documented in the time use studies of Bianchi (2011), Ramey and Ramey (2010), Dotti Sani and Treas (2016), and Doepke and Zilibotti (2019), among others. Carney (2024) makes a qualitative case that Americans have made parenting more intense and demanding than it needs to be, and that this is contributing to the move toward smaller families and childlessness.

Changing norms regarding the intensity of parenting might change people's views toward how many children to have or whether to have them at all (as in Mahler et al. 2025). Such changes are particularly relevant in an era in which parents, including mothers, work longer hours outside the home, clashing with career aspirations or a desire for more leisure time. More research is needed into the questions of how norms around intensive parenting causally shape intended and realized fertility, as well as how they might be changed to make parenting less stressful and more compatible with other life goals.

B. Evolving Norms Around Work

A model that presumes women drop out of the labor force to care for children is less likely to explain modern day fertility patterns than is a model that highlights the tension between pursuing market work and raising children. Most women in high income countries, including married women and women with children, now work for pay outside the home.

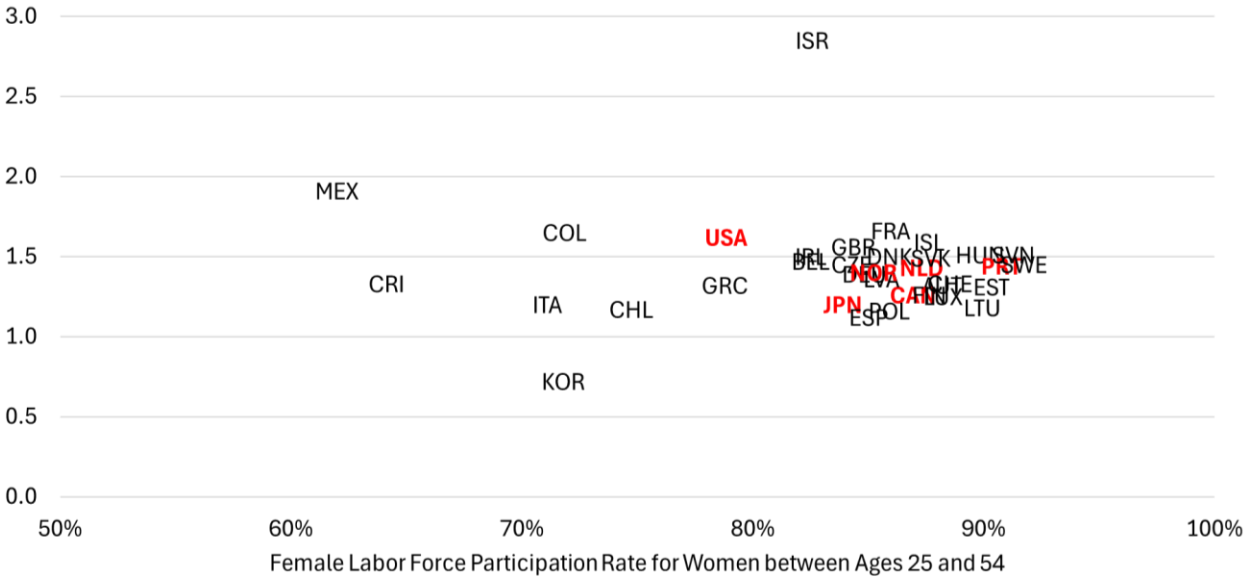
In a recent review of the economic approach to modeling fertility, Doepke et al. (2023) observe that the economic analysis of fertility has necessarily entered a new era. They observe that early economic models -- including Becker 1960, Becker and Lewis 1973, and Butz and Ward, 1979 – put forward two key ideas (the quality-quantity trade-off in children and women's opportunity cost of time) to account for two empirical regularities – a negative link between income and fertility and a negative link between female labor force participation and fertility. The authors show that neither of those empirical regularities exist in high-income countries today – at a country level, there is no longer a negative relationship between income and fertility nor between female labor force participation and fertility. They thus conclude that new models are needed. They emphasize the importance of considering the compatibility of family and career as a key determinant of fertility in high-income countries today.

Doepke et al. (2023) report data showing that between 1980 and 2000 the cross-country relationship between total fertility rates and female labor force participation switched from being negative in 1980 (with a correlation of -0.34) to being positive by 2000 (with a correlation of 0.59). However, as we have previously shown, that correlation fell considerably after 2000 (Kearney and Levine 2022). As we show in Figure 9 below, by 2023, the relationship between these two variables in OECD countries is almost nonexistent, with a correlation of -0.06. In most of them, female labor force participation rates are between around 80 to 90 percent, despite substantial variation in total fertility rates. The two variables are just not meaningfully correlated (in either a positive or negative direction) across countries.

We propose that it is now more appropriate to consider and model labor force participation as the default option, and fertility as the discretionary activity. This reflects a major shift in societal norms and practices over the past several decades. Women in earlier cohorts were more likely to have children and less likely to work. Back then, it is reasonable to consider having children as a widespread priority for women, perhaps reflecting societal norms and expectations, and sustained participation in the paid labor force as the more "optional" choice.

That presumptive ranking quite possibly has reversed. If market work is now the norm, the labor market norms and practices, including the expectations of "greedy jobs" as described by Goldin (2014), may alter fertility behavior. The tradeoff between market work and childbearing is now about the tension between a lifetime career and the way motherhood interrupts or alters that lifetime career progression, rather than about whether women work at all after they are married or have had their first child.

Figure 9: Total Fertility Rates in 2023 and Female Labor Force Participation Rates in 2023 for Women between the Ages of 25 and 54 in OECD Countries



Sources:
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United Nations Population Division (2024). *World Population Prospects: 2024 Revision* (available at: https://population.un.org/wpp/, accessed June 4, 2025).

LFPR
OECD (2024). Employment and Unemployment by Five-Year Age Group and Sex (Indicator). *OECD Data Explorer* (available at: https://data-explorer.oecd.org/, accessed June 4, 2025)

C. Evolving Norms Around Gender Roles

A related issue is the role of evolving norms around gender roles and expectations for household and parenting responsibilities. An emerging body of evidence suggests that women and men are increasingly likely to hold differing views about gender roles, the appropriate distribution of household chores, and even the ideal number of children to have. As women today are more likely than women in previous generations to expect and even demand a more egalitarian division of household and childcare responsibilities, there is likely to be conflict that leads to both less marriage and lower fertility.

Social norms around gender roles are also likely important for shaping decisions that fit within a model that emphasizes the tension between work and parenting, and more generally, the importance of motherhood to women's identity. Research has established that the historical cultural transmission of social norms and expectations around women's role in society and fertility can have long lasting effects (Alesina, Giuliano, and Nunn 2013; Spolaore and Wacziarg, 2021; Beach and Hanlon, 2023).

Doepke and Kindermann (2019) use data from the Gender and Generations Programme (GGP) to examine how couple preferences relate to fertility outcomes. They document that a birth is likely to occur only if both parents desire a baby, and that in many instances couples disagree about having babies. Furthermore, the authors document that in low-fertility countries women are much more likely than men to be opposed to having another child. They show that these patterns are consistent with a model of household bargaining in which the distribution of the burden of childcare between mothers and fathers is a key determinant of fertility. Descriptive evidence is consistent with such a model. In countries where men do less childcare, women are more likely to not want to have another child.

Briselli and González (2023) propose that men's resistance to increase their contribution to home production is an important factor holding back fertility, as well as female employment, in high-income countries. They document that while women give an increasing amount of importance to the sharing of childcare and housework, men's views remain unchanged over time, leading to a growing gap in attitudes. This trend contrasts with the trend in views regarding women's participation in the labor market, which have evolved in parallel for men and women. The authors further show that this divergence in attitudes is strongly correlated with fertility rates and with female labor participation rates, in cross-country and cross-cohort regressions using data from European countries. Fertility declines and female employment is relatively lower in countries and cohorts where men report a stronger reluctance to share childcare and housework.

At a country level, Goldin (2024) observes that in countries where gender roles around raising children have not evolved as quickly as economic growth, women are still expected to shoulder a larger share of household and childcare responsibilities despite having high rates of labor force participation, which could be contributing to lower fertility. Goldin's observation is based on the historical experience of 12 countries. It relates to the idea suggested by Feyrer, Sacerdote, and

Stern (2008) that there is a U-shape relationship between female employment (and income per capita) and fertility by country. Nations at a lower level of economic development feature low female employment, high fertility, and high division of labor in the home; as economies advance, female employment rises, but there is still a high division of labor in the home and fertility falls; ultimately, as economies advance further, there is the potential for a new equilibrium of high female employment, low division of labor in the home, and moderate fertility. Goldin suggests that some countries in Europe and Asia – specifically, Greece, Italy, Japan, Korea, Portugal, and Spain – experienced very rapid economic growth in the post-1950s but maintain traditional belief systems around gender roles and family, heightening the conflict between women's work and childcare responsibilities, and causing especially low fertility.

D. Effects of Media

Media and social media influences have potentially contributed to the widespread decline in fertility. We can't say definitively the extent to which this is true because to the best of our knowledge, nobody has (yet) documented whether media portrayals of parenthood tend to be negative, or more negative than in the past; or relatedly, whether media portrayals of a child-free life are especially appealing, or more appealing than in the past.

But what we do know is that social science research has clearly established that media content can affect marriage, fertility, and family formation. For instance, economists have documented that the introduction of telenovelas, which featured smaller families and divorce as part of their plot lines, to television programming in Brazil led to a drop in fertility and a rise in divorce and separation among Brazilians exposed to the programming (La Ferrara, Chong, and Duryea 2012 and Chong and La Ferrara 2009). Jensen and Oster (2009) found that the introduction of cable television in rural Indian villages led to a change in attitudes toward women, with decreased acceptance of domestic violence and increased school enrollment among girls. In the US context, the depictions of the difficulties associated with being a teen mom as shown on the MTV reality television show *16 and Pregnant* have been causally linked to a decline in rates of teen childbearing (Kearney and Levine 2015).

These studies demonstrate that social norms around relationships and childbearing are malleable and responsive to implicit messaging absorbed through media, or what has been referred to as "edutainment." It is an important and open question how media portrayals of marriage and parenthood in recent decades – not just on television, but also on popular social media platforms like Instagram and TikTok – have affected people's attitudes toward family formation and ultimately to fertility outcomes.

E. Religious Influences

It is possible that declining religious observance has contributed to declining fertility across recent cohorts. Religious observance and participation in religious communities potentially contribute to fertility choice through a messaging effect, the establishment and enforcement of social norms, and community support for families. Cross-sectional data routinely show that people who identify as religiously observant have more children and that places that are more religious have higher fertility rates (e.g. McQuillan 2004 and Frejka and Westoff 2008). The time series correspondence between declining religious observance and declining marriage and

fertility suggests a link between these two factors. Again, though, it is unclear why religiosity has declined and more research into the causality of these trends is needed.

A set of studies has documented a causal influence of Papal messaging on fertility. Bassi and Rasul (2017) and Farina and Pathania (2020) examine the role of Papal visits on fertility in Brazil and Italy, respectively, finding contrasting results. Bassi and Rasul (2017) document a short-term increase in fertility resulting from a decline in contraception, while Farina and Pathania (2020) find a decline in abortion with no increase in fertility. Iyer, Lopez de mesa Moyano, and Moorthy (2025) show that the visits of Pope John Paul II to 13 Latin American countries between 1979 and 1996, which reinforced Catholic Church teachings, led to significant and positive long-term effects on fertility. They find that effects are driven by first births and are larger when the Pope gave a speech in the corresponding area that specifically mentioned marriage or admonished abortions and contraception.

F. Takeaways

There are compelling conceptual and empirical reasons to think that factors other than the standard explanations of prices, income, and opportunity costs are largely responsible for the decline in fertility that has occurred across high-income countries in recent decades. A growing body of evidence supports the notion that evolving norms around parenting, work, and gender roles have contributed to the decline in fertility across high-income countries. There is also evidence that social and cultural influences coming from media and religious leaders have an effect on fertility outcomes. Additional work into the role of these types of influences would advance our understanding of the drivers of large-scale changes in fertility across cohorts, and potentially also across different groups.

V. THE ROLE OF PRICES, INCOME, AND WOMEN'S WAGES

In this section we review the evidence on the role of prices, income, and the opportunity cost of women's time (often measured in terms of women's wages) in driving fertility rates, which are more commonly considered in the economics literature on fertility. This emphasis follows the standard neoclassical approach dating back to Becker (1960). In our review, we attempt to distinguish between changes within a cohort versus across cohorts. This conceptual distinction is useful and helps link the empirical evidence to the overarching question about fertility declines across cohorts. It can also help inform discussions about the potential impact of commonly proposed pronatalist policies.

A. Changes in Individual and Household Income

It is well documented that as societies get richer, fertility rates fall. As societies have developed economically, economic opportunities for women have expanded, educational aspirations for children have increased, and fertility has fallen. These macro, aggregate trends might lead one to inappropriately conclude that children are "inferior goods." But micro-level causal analyses of income shocks in a variety of modern high-income contexts have documented that unconfounded increases in income lead to an increase in birth rates, supporting the view that children are, in fact, "normal goods." In this section we highlight a few such studies, noting if a study observes changes in lifetime completed fertility, or just short-term changes in birth probabilities.

In one such study, Lindo (2010) estimates the fertility impact of a husband's job displacement, which generates a large and persistent negative income shock. His analysis finds that the income loss reduces total completed fertility, indicating that household income has a positive causal effect on the number of children couples have over their lifetime. His estimates imply an income elasticity of fertility on the order of 0.15.

Two other studies focus on the impact of income changes generated by changes in the energy market. Black et al. (2013) document that the rise in world energy prices in the 1970s led to an increase in men's earnings in the Appalachian coal-mining region, leading to an increase in births to married couples. Women in coal counties had higher fertility rates than women in the noncoal counties at every age 27 through 34. Kearney and Wilson (2018) similarly document that the localized fracking booms in the early 2000s led to an increase in the earnings of non-college educated men and an increase in birth rates at that time (they do not look at completed fertility). They note an interesting contrast between the impact of the 1970s coal price boom and the early 2000s fracking boom. In the former, marriages and marital births increased whereas in the latter, both marital and non-marital births increased, with no effect on marriage rates. This illustrates the potential importance of prevailing social norms around fertility and marriage, which changed between the two events.

Direct cash transfers have also been associated with modest increases in fertility. For instance, Wyndham-Douds and Cowan (2024) and Yonzan, Timilsina, and Kelly (2024) analyze the Alaska Permanent Fund Dividend, a program that provides annual cash payments to residents. Both studies find that these payments led to increased birth rates in Alaska, suggesting that expanding a household's budget constraint encourages childbearing, particularly in the short term. Bulman, Goodman, and Isen (2022) examine the impact of larger windfalls of cash, using U.S. tax data to examine the effects of state lottery winnings from 2000 to 2019. They find that lottery wins increase homeownership, marriage rates, and the likelihood of giving birth in the year after the win. However, they observe no significant effect on total births within five years. This finding underscores the importance of separately considering changes in short-term increases in fertility, which might just reflect shifts in timing, and changes in completed fertility.

Together, these studies provide ample evidence that exogenous increases in income tend to raise birth rates. They demonstrate how economic shocks that expand household budget constraints lead people to have more children, either in the sense of affording births in the near term (moving up timing) or having more children overall (increasing lifetime completed fertility).

However, despite the evidence supporting a positive link between shocks to income and fertility, it does not yield much, if any, insight into the decline in fertility across cohorts. First, personal and household-level income has not been falling across cohorts. Second, the income shocks examined are very different than the potential impact of broader increases in societal wealth or economic opportunities.

B. Child Benefits and Tax Credits

Child benefits and tax credits are frequently implemented pro-natalist policies. These policy measures target parents' budget constraints through a reduction in the "price" of children or an increase in income conditional on having a child. In general, causal studies of these policies find

that these incremental changes lead to positive, but modest increases in fertility, often driven by higher-order births. Some studies find that the increase in annual births observed after the introduction or expansion of a child benefit reflects timing effects, but other studies do find an increase in completed fertility.

Others have provided extensive reviews of the large number of studies that aim to identify the causal impact of pro-natalist child benefits and tax credits in many countries throughout Europe and Asia, as well as the United States and Canada. These reviews include Sobotka, Matysiak, and Matysiak (2019), Stone (2020), and Bergsvik, Fauske, and Hart (2021). These reviews conclude that specific pro-natalist policies that have been implemented in recent decades tend to be associated with positive but modest increases in fertility. We mention just a handful of studies here and refer the interested reader to these other sources for more comprehensive reviews of the evidence on child-specific benefits and tax credits and fertility. Beyond the recent studies on child benefits and tax credits highlighted here, there is an extensive literature on the link between US welfare programs and birth outcomes. That literature generally finds very small, if any, effects of cash welfare on birth rates (Lopoo and Raissian 2018).

Cohen, Dehejia, and Romanov (2013) is one such example of an analysis of cash subsidies on fertility. They examine the fertility effects of Israel's substantial child allowance over the years 1999 to 2005. They find a significant positive causal effect of child allowances on births, driven by women in the bottom half of the income distribution and present for all religious groups. They further find that the unanticipated reduction in child allowance amounts in 2003 had a substantial negative impact on subsequent births. González (2013) studies the fertility effects of the introduction of a sizable child benefit in Spain in 2007 (2,500 euros per family), finding that annual births increased by 6 percent and eligible mothers stayed out of the labor force longer after childbirth. Riphahn and Wiynck (2017) find that the introduction of child benefits in Germany in 1996 led to a positive effect on annual births, with larger effects for second births and women from higher-income households. Bokun (2024) studies Poland's implementation of a "Family 500+" child benefit program, which provides families with a sizable monthly cash transfer for each child. She finds that the cash transfer is associated with small increases in annual births in the years immediately following implementation, driven by women in their 30s and women in lower income households. Studies from Norway (Aassve and Lappegård 2009 and 2010), Canada (Milligan 2005), France (Laroque and Salanie 2008), and South Korea (Kim 2024) also report positive short-term fertility effects.

Stone (2020) identifies nearly two dozen academic studies published since 2000 that credibly identify the causal effect of a specific pro-natalist policy like a child benefit, a child tax credit, a baby bonus, or a maternity payment, and provide sufficiently detailed estimates of effect sizes that he can calculate implied elasticities across studies. From this Stone concludes that an increase in the present value of child benefits equal to 10 percent of a household's income can be expected to produce between 0.5 percent and 4.1 percent higher birth rates.

This evidence does not rule out the possibility that an extremely large and sustained transfer of child-linked income to parents, say through a very large annual child tax credit, could potentially lead to an increase in fertility. Such a transfer would have to be much larger than the types of incremental reforms that have been tried to date. Its effectiveness would result from its ability to

change the prospective views of women at early stages of their childbearing years regarding their future path should they have any or more children.

C. Female Labor Force Participation and Earnings

As we previewed above, changing work norms across cohorts are potential contributors to changing fertility. In Kearney, Levine, and Pardue (2022) we found no correlation between female/male wages from 2004 to 2018, but that doesn't mean that changes in labor force opportunities for women across cohorts haven't been important to the decrease in fertility across cohorts. In this section, we discuss female labor force participation in a broader sense than is typically considered in a period-specific analysis.

In this section, we appeal to a conceptual emphasis on the practical tension parents face between allocating time and energy between market work and professional pursuits versus raising children. When we refer to "tension," we have in mind a potential decrease in the utility of having children in a context where work obligations make parenthood less enjoyable, as well as an increase in the price of children in a context where work obligations make parenthood more professionally costly. This is a broader notion of the price of children than a focus on period-specific direct prices, such as childcare or housing outlays.

The tension between spending time in the paid workforce and spending time raising children is apparent in earnings data. Considerable empirical evidence shows that mothers experience a drop in earnings immediately after the birth of a child that is larger than any drop in earnings experienced by fathers (e.g. Angelov, Johansson, and Lindahl 2016 show this in Sweden; Bailey et al. 2025 show this in the US). The drop in earnings for women after having a first birth reflects changes on both the extensive and intensive margins of labor supply. For instance, using Danish administrative data from 1980 to 2013, Kleven et al. (2019) document that the post-birth drop in earnings for mothers is explained in roughly equal proportion by a decline in labor force participation, hours of work, and wage rates.

More broadly, the drop in earnings around the onset of motherhood is universally observed across countries, as documented by Kleven, Landais, and Leite-Mariante (2024) in their "Child Penalty Atlas." They rely on pseudo-event studies of the birth of a first child using cross-sectional data on earnings. In most countries, the earnings of men and women follow parallel trends before parenthood, but they diverge sharply and persistently after parenthood. Although this pattern is pervasive across countries, there is massive variation in the magnitude of the relative earnings loss experienced by mothers across world regions. More advanced economies feature a wider gender divide in earnings post parenthood. Doepke et al. (2023) interpret this evidence as supporting the role of "country specific factors such as family policy, the gendered division of childcare duties, social norms, and labor market institutions." We have addressed many of these issues earlier.

Whether this earnings drop would affect fertility depends on the reasons it occurs. It could reflect constraints that make it hard for mothers to continue working at the level they would like. If so, then the earnings drop might discourage fertility. Alternatively, it could reflect mothers' relative preference for stepping back from work to spend time with their children. If so, then the earnings drop would reflect an endogenous choice and likely not discourage fertility. The large earnings

drop mothers experience after giving birth is often labeled a "penalty" in the literature, but it is not clear to what extent it is the result of externally imposed forces, as opposed to reflecting a mothers' "willingness to pay" for time with one's child.

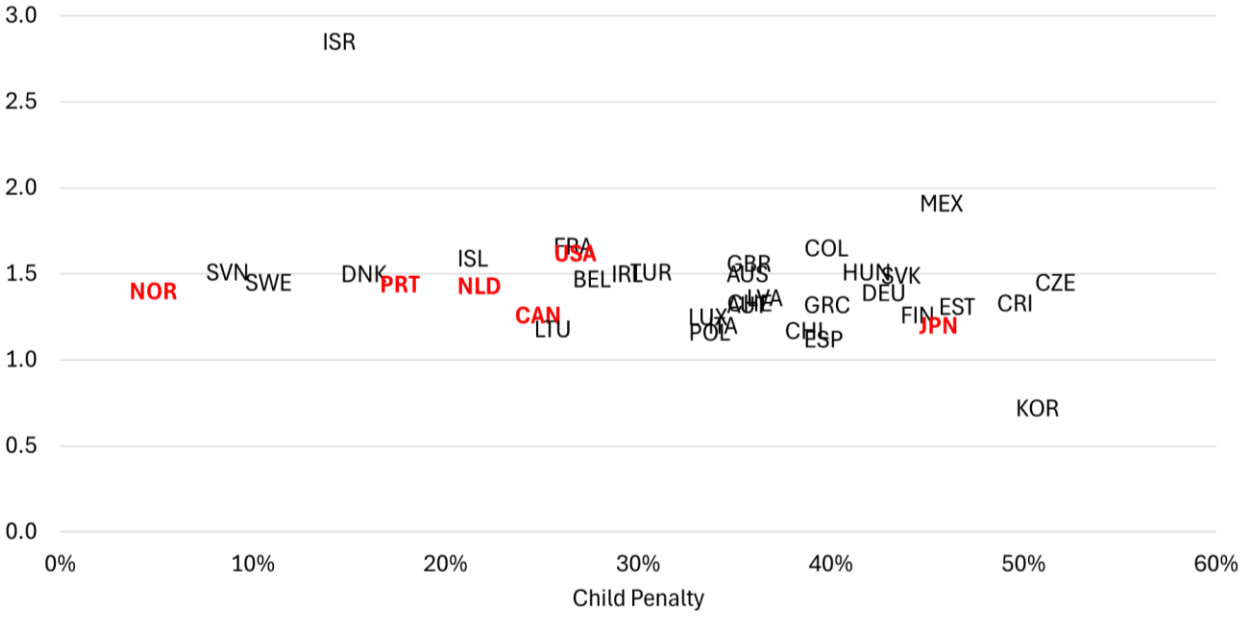
Evidence from other work by Kleven and coauthors suggests that social norms and intergenerational preferences are important drivers of mothers' drop in earnings post-birth than are policies. Kleven, Landais, and Søgaard (2019) show, using Danish administrative data from 1980-2013, that maternal reductions in earnings are strongly related to the labor supply history of the maternal grandparents. Women whose mothers worked little compared to their fathers experience a larger drop in earnings when they become mothers. These findings are consistent with an influence of nurture in the formation of women's preferences over family and career. In the context of the US, Kleven (2022) documents a large degree of geographic variation in the earnings drop among new mothers. This variation can be explained by regional differences in gender norms and cultural expectations. Places with a higher gender progressivity index – as captured by data from General Social Survey data from 1972-2018 – show a smaller reduction in employment among mothers. In addition, women who have moved across state lines between the time they were born and gave birth themselves face a larger "child penalty" if that penalty is larger in their state of birth. Similarly, the so-called child penalty for foreign immigrants is strongly related to the so-called child penalty in their country of birth.

Cross-national comparisons further suggest that factors outside the scope of labor market policy may play an important role in determining fertility rates. Figure 10 plots the simple cross-sectional relationship between child penalties (as measured by Kleven et al., 2024) in OECD countries and total fertility rates. There is a downward sloping relationship with a correlation of -0.34, but it is almost entirely driven by Israel and South Korea. Omitting those countries lowers the correlation to -0.14. Except for those two countries, TFRs are generally clustered in the vicinity of 1.2 to 1.6 regardless of the size of the wage penalty.

We should be clear that it would be inappropriate to draw too strong conclusions from this simple correlation. Perhaps the lack of a relationship between these variables is because the so-called child penalty measured from earnings data does not sufficiently capture the relevant tension between market work and parenting as it contributes to fertility choice. It may miss other aspects of that tension, like the logistical hassle and high degree of stress caused by combining work and parenting. We leave this question for future research.

As a conceptual matter, institutions that alleviate that tension, such as high-quality, accessible childcare and paid leave, should, all else equal, lead people to choose higher fertility. Institutional factors or social norms that worsen the tensions, such as inflexible or "greedy" jobs (Goldin 2014) should, all else equal, lead people to choose lower fertility. If the bargaining resolution between mother and father over parenting responsibilities falls more heavily on the mother, that may also reduce fertility (Doepke and Kindermann 2019). These observations relate to our discussion about evolving social norms above.

Figure 10: Total Fertility Rates in 2023 and "Child Penalties" in OECD Countries



Sources:
TFR: United Nations Population Division (2024). *World Population Prospects: 2024 Revision* (available at: https://population.un.org/wpp/, accessed June 4, 2025).

Child Penalties: Kleven, Landais, and Leite-Mariante, 2024

D. Paid Leave and Childcare

Several high-quality studies using well-identified, quasi-experimental methods have been conducted examining incremental policy reforms that lower the costs of children through paid leave and childcare provision or subsidies. They focus on paid parental leave and the provision of childcare services on fertility. For the most part, these studies conclude that these policies have limited effects on completed fertility.

Several studies focus on parental leave. Bailey et al. (2025) examine the impact of California's 2004 Paid Family Leave Act; they find no evidence of an effect on fertility. Dahl et al. (2016) similarly find that expansions to existing paid maternity leave policies in Norway in the late 1980s and early 1990s had no discernible effect on fertility rates. Andersson, Hoem, and Duvander (2006) find that the lengthening of paid parental leave in Sweden led many women to have their subsequent child before the end of the parental leave. This was a transitory timing effect, though, and led to no increase in completed fertility. In one exception to this pattern, Malkova (2018) finds that Russia's 1981 expansion in parental leave and a small cash transfer had sizable effects on fertility in the 12 months following the policy's introduction and that these effects persisted for its 10-year duration. The increase, though, largely reflected increases in higher-order births to older women who already had children before the program started.

In related research, Kleven et al. (2024) focus on the earnings loss associated with childbearing in a similar manner to their research described above. They show that the enormous expansion of

parental leave and childcare in Austria had virtually no impact on the gender convergence in earnings for mothers and fathers. They also replicate the findings of Lalive and Zweimüller (2009) showing that the 1990 paid leave reform in Austria had a positive and persistent effect on the likelihood of a second birth, but that impact was small. Moreover, they show that there is no impact of the policy on the more relevant fertility outcome of completed fertility.

In terms of child care alone, Havnes and Mogstad (2011) exploit the staggered rollout of subsidized child care in Norway in the 1970s. They find that increased access led to a modest increase in higher-order births. Cross-national studies further support the notion that comprehensive child care policies are associated with higher fertility rates in low-fertility contexts. Olivetti and Petrongolo (2017) use panel data methods applied to cross-national data over time to estimate the relationship between childcare spending and fertility. Although they find a positive relationship, their estimates indicate that it would take a one percentage point increase in GDP spent on early childhood education and childcare to increase the TFR by around 0.02 units. This means the United States would need to spend $280 billion in 2025 to increase the TFR from 1.62 to 1.64.

E. Housing Costs and Housing Wealth

Housing is a major expense associated with having children, and it is also a major wealth asset for homeowners. In this section we highlight studies that use causal identification methods to estimate how housing costs and housing wealth affect fertility outcomes.

Dettling and Kearney (2014) document that exogenously determined increases in area-level house prices leads to a reduction in birth rates among non-homeowners, but an increase in birth rates among homeowners. Specifically, they find that a $10,000 increase in house prices in the United States in the 2000s led to a 5 percent fertility increase among homeowners at that time, consistent with a positive effect of increased housing wealth or equity on birth rates, and a 2.4 percent decline among non-owners, consistent with a negative price effect for non-owners. The disparate effects for homeowners and nonhomeowners are consistent with the existence of negative price effects and positive wealth effects of house prices on period-specific fertility. Lovenheim and Mumford (2013) similarly find that MSA-level increases in house prices, which constitute a positive wealth shock, lead to an increase in birth rates among homeowners. Daysal et al. (2021) find similar evidence of a positive housing wealth effect among homeowners in Denmark.

Other studies find birth effects from changes in mortgage costs that affect the liquidity of homeowners. Hacamo (2021) finds that young adults exposed to mortgage market deregulation and lower mortgage costs in the US in the mid-2000s were more likely to purchase a home and have a child. Cumming and Dettling (2024) study the impact of mortgage interest rates on birth rates in the US and the United Kingdom around the time of the Great Recession, finding that lower mortgage interest rates due to monetary policy actions raised birth rates among homeowners with adjustable rate mortgages. This study adds to our understanding of the cyclicality and timing of births, confirming that cyclical monetary policy can affect birth rates by affecting homeowners' liquidity. But note that many young adults today are not homeowners, so the positive effects on the fertility of homeowners does not necessarily lead to large increases in the aggregate population.

F. Home Ownership

Beyond the effect of house prices, we raise the possibility that there is potentially an effect of access to home ownership on fertility – and cohort level fertility in particular – that is greater than just the income or price component of housing. Specifically, we acknowledge the possibility that owning a home – or the perception of being able to afford and own a home – affects the choice among young adults to start a family or have children in a way beyond a typical income or price effect. In the "shifting priorities" framework we described above, the accessibility of home ownership might be a relevant contextual factor that affects cohort level fertility.

Though societal expectations for family housing differ across places and people, survey data from US adults reveals a preference for more space, including bedroom space, when they have or are considering having children (Cox and Stone 2025). The fact that home ownership has generally fallen among young adults raises the possibility that a decline in access to home ownership – potentially due to limited supply of family-oriented housing, a decline in access to credit, and other factors – among young adults have contributed to the decline in fertility.

Establishing a causal link between home ownership per se and fertility is complicated by the joint determination of home ownership and family formation preferences and outcomes. But two new papers credibly establish a sizable positive causal link between access to home ownership at a younger age and fertility. Fazio et al. (2024) examine the impact of randomized access to housing credit awarded through a lottery system affects fertility rates in modern day Brazil. Their estimates suggest that individuals in their early 20s who receive access to housing credit have twice the completed fertility as compared to others who do not obtain that credit until their early 30s.

Dettling and Kearney (2025) study the impact on fertility of the introduction of low down payment, government-guaranteed mortgages in the 1930s and 1940s. The government mortgage programs introduced in those decades led to dramatically higher rates of home ownership among young couples. Using newly digitized data on loan issuance and births by state-year and an instrumental variables (IV) strategy, the authors find a statistically significant and economically meaningful causal effect of government-backed mortgages in a state and year on births in that state the following year. Their estimates imply that these low downpayment mortgages can causally explain about 10 percent of the rise in annual birth rates during the Baby Boom period. They provide additional evidence suggesting that cohorts exposed to these mortgages had an earlier age at marriage, an earlier age of first birth, and ultimately higher completed fertility.

In their paper, Dettling and Kearney (2025) speculate that a possible interpretation of their results in the context of aggregate birth trends over the last 100 years is that they could fit into a variant of the seminal work by Easterlin (1966) on the "relative income" hypothesis in which a cohort's material aspirations form not around income *per se* but instead around visible consumer goods, most notably home ownership. They observe that in this framework, the one-time upward shift in home ownership rates that occurred in the mid-twentieth century could have established an expectation of home ownership for future generations of would-be parents. The stalling out or reversal of home ownership trends might thus lead to a reduction in fertility. The authors note that in the US, the post-Great Recession period featured a precipitous decline in home ownership rates among younger adults, which corresponds to the precipitous decline in US birth rates. For

recent cohorts, their material aspirations for home ownership were not realized and this might have led to decreased childbearing.

G. Takeaways

The research reviewed in this section provides support for the notion that prices, income, and the opportunity cost of women's time in terms of labor market opportunities and earnings affect fertility outcomes. However, the empirical evidence also implies that changes in these factors are unlikely to explain a substantial share of the recent decline in fertility in high-income countries.

In terms of policy implications, we conclude that providing income transfers or highly subsidized or free childcare could potentially lead to an increase in fertility, but to have sizable effects, any such interventions would have to be much larger than the types of incremental pro-natalist policies that have been tried to date. Large expansions in access to home ownership might have meaningful effects, as that type of change could potentially alter the family formation and fertility decisions of future cohorts of young adults. Similarly, while incremental increases in paid leave are unlikely to have large effects on fertility, meaningfully addressing the multi-year conflict between work and parenting that parents face might affect the lifetime decisions of future cohorts. These possibilities warrant further investigation.

VI. CAUSES OF FRICTIONS BETWEEN INTENDED AND REALIZED FERTILITY

Our discussion of fertility determination up until this point has largely ignored the uncertainty around fertility outcomes. Modeling fertility determination in a standard choice optimization framework is useful and appealing, but that approach abstracts away from the important issue of uncertainty. Someone might make the choice to have a certain number of children over their lifetime and decide on the optimal lifecycle timing of childbearing, but there are many factors that may lead them to deviate from their plans. The uncertainty around childbearing comes from many sources and can lead to either a higher or lower level of individual fertility than planned, or earlier or later childbearing than planned.

Some of that uncertainty comes from the biology and technology of getting pregnant. From a period-specific perspective, an enhanced ability to prevent a pregnancy or birth through more effective contraception should result in fewer births in that period. Greater access to abortion at a point in time may lead to fewer births among women with an unintended pregnancy, though there is evidence that in some contexts, expanded abortion access leads to an increased probability of pregnancy and consequently births (Levine 2003). Greater access to fertility treatments at a point in time may lead to more births in that period among people struggling with infertility, but it may also lead some people to delay attempts to get pregnant and have an offsetting negative effect on period-specific birth rates.

From the perspective of completed lifetime or cohort fertility, it is *ex ante* unclear how period-specific changes in access to contraception, abortion, or fertility treatments will alter completed fertility. Does an additional pregnancy prevented at age 25 or achieved at age 35 change the number of children ever born to a woman by age 40, or does it just shift the time path of

childbearing? To what extent does intentional delay lead to fewer children ever born? If women purposely delay childbearing to older ages, difficulties conceiving at older ages may lead to lower completed fertility than desired (Geruso et al. 2023).

Overall, changes in the ability to control if and when a woman gets pregnant and gives birth can contribute to changes in the birth rate. In this section, we review evidence from the economics literature on the role that these forms of uncertainty play.

A. Survey Evidence About Shifting Preferences and Priorities

Before moving on to the impact of this uncertainty, we first consider what survey data reveal about fertility desires, intentions, and ideals, and how they differ from realized fertility.

A recent muti-country study by Aassve et al. (2024) use a vignette design to elicit preferences about family ideals among study participants in urban China, Japan, South Korea, Singapore, the United States, Italy, Spain, and Norway. Participants were asked to evaluate vignettes describing families whose characteristics vary on ten dimensions, allowing researchers to identify the relative importance of each dimension. They find that parenthood remains a positive ideal, but the number of children they have is less important. This suggests that people may have moved away from the conventional two-children ideal. The authors note that differences in family ideals vary somewhat across countries, they also find a good deal of consistency in their preferences.

The results of this multi-country vignette study are noteworthy in revealing that across countries, people today generally consider having at least one child as an ideal. This suggests that the rise in childlessness documented above cannot completely be explained by a shift away from the desire to have any children.

Some long-running studies attempt to measure fertility ideals, desires, and intentions using direct survey questions. A major limitation in interpretating these survey data is that it is not clear how to precisely interpret what is being measured. As noted by Miller (2011), the research literature has struggled to adequately model and interpret fertility desires and intentions because these constructs have been measured differently by different investigators and not all surveys attempt to separately measure desires and intentions. For our purposes, we take the measured concept in a survey as given and compare it to realized fertility, recognizing that any gap between realized fertility and the measured concept reflects a deviation between realized fertility and some measure of desire, intention, or ideal.

This type of survey data reveals two interesting facts. First, people tend to state higher desired or intended fertility than they have. Second, survey respondents in more recent cohorts tend to report that they desire or intend to have fewer children than earlier cohorts.

Data from the 2011 OECD family database reveal that on average, across OECD countries with available data, the mean personal ideal number of children reported by adults ages 25 to 39 is higher than the actual mean number of children people have (OECD 2016). Men report an ideal of just under 2.2, on average, and for women it is 2.3. There is substantial variation in the average reported ideal across OECD countries, with the highest in Ireland (2.6 for men and 2.8 for women) and the lowest in Austria (below 1.5). However, for all countries, the stated ideal

exceeds realized fertility by a sizable gap. Data from Statistics Canada's General Social Survey reveal that reported fertility intentions have been decreasing since 2011, along with the country's TFR. These data also reveal that intended fertility remains above TFR (Laplante and Blouin 2024).

Similarly in the US, fertility intentions have declined in recent years and across cohorts, but they remain above the realized TFR. Hartnett and Gemmill (2020) examine data from the 2006-2017 National Survey of Family Growth (NSFG), finding that intended total number of children declined from 2.26 in 2006-2010 to 2.16 children in 2013-2017, and the proportion intending to remain childless increased slightly. This decline in intended number of children is modest, and average intended parity remains above two children, exceeding realized fertility. Guzzo and Hayford (2023) also examine trends and patterns in intended fertility using NSFG data. They find that although more recent cohorts exhibit lower achieved fertility at younger ages than earlier cohorts at the same age, intended parity remains around two children, and intentions to remain childless rarely exceed 15 percent. They conclude from their exploration of the data that "declines in U.S. fertility thus seem to be largely driven not by changes in early-life fertility goals so much as either a decreasing likelihood of achieving earlier goals or, perhaps, shifts in the preferred timing of fertility that depress period measures."

The fact that people across countries and age groups consistently report a higher level of desired or intended fertility than what they experience raises the distinct possibility that the widespread decline in fertility does not entirely reflect a change in deliberate choices. It might also reflect a meaningful and growing wedge between desires and realizations. This wedge could reflect a failure to find a suitable spouse or partner or obtain some threshold level of economic security by a certain age. It could also reflect the biology and technology of reproduction. We return to these topics below.

B. Access to Highly Effective Contraception

Contraceptive methods have improved over the past half century in ways that make it easier to prevent pregnancy. The introduction of the birth control pill in the 1960s in many countries provided the first "modern" form of contraception. When used as prescribed, it is highly effective in reducing the likelihood of getting pregnant. More recently, there has been an increase in the availability of long-acting, reversible contraception (LARC). These include intrauterine devices (IUDs, now with updated designs) and subdermal hormonal implants. They have been available in many countries for roughly the past 30 years. These approaches to birth control are even more effective than birth control pills, partly because they do not require the user to take active steps ("set it and forget it").

The introduction and expansion of the use of these methods are well-timed to the declining birth rate. Previous research has explored the role that the introduction of birth control pills had on US fertility, showing large effects at that time (Bailey 2013). It also reduced lifetime fertility among married women in the US (Bailey 2010). Similar evidence from other countries is limited.

But that technology change well pre-dates the more recent decline in birth rates, certainly in the U.S. Japan was the exception; it did not legalize access to birth control pills until 1999. Pill use is

still quite uncommon there even to this day (Yoshida et al. 2016) and still it is among the countries with the lowest fertility rate.

Expanded access to LARCs also led to a reduction in births among select economically disadvantaged subgroups. One quasi-experimental study shows that the Colorado Family Planning Initiative launched in 2009 with the goal of helping low-income women gain access to LARCs led to a meaningful reduction in teen births, especially in poor counties (Lindo and Packham 2017). A randomized controlled trial study of a voucher program run in Michigan Planned Parenthood clinics in 2019 found that vouchers that covered half to all of the cost of a LARC led to increased LARC take-up and a reduced likelihood of pregnancy among low-income women reproductive health care (Bailey et al. 2024). In our own past work, we found that the differential diffusion of LARC usage across states in the U.S. is not highly correlated with differential rates of decline in fertility among all women (Kearney et al. 2022).

Other research has explored the impact of governmental policies that alter access to available methods of contraception primarily for lower-income women. Bailey (2023) reviews this evidence, finding support for a causal link between contraceptive access and childbearing for them. In our own research (Kearney and Levine 2009), we found that an expansion of Medicaid coverage for family planning services to a greater share of women led to a statistically significant reduction in births.

It is important to note that these studies focus on this narrow population subgroup, not the broader female population. The estimated magnitudes of impacts for them are not large enough to translate into large aggregate effects. In other words, expanded access to highly effective contraception in the US in recent decades cannot explain much of the large overall decline in births. Furthermore, these studies are also period-based. It is unclear whether any short-term impact represents delay or a reduction in completed fertility. Overall, it would be difficult to conclude that greater contraceptive access has played much of a role in the recent decline in fertility, at least in the U.S., which is the focus of much of this research.

C. Abortion Policy

Abortion access is another way in which government policy can affect birth rates. For instance, the legalization of abortion in the U.S. in the early 1970s led to a roughly five percent decline in the general fertility rate (Levine et al. 1999). Ananat, Gruber, and Levine (2007) also show that the immediate impact of abortion legalization resulted in permanent reductions in the number of children ever born, not delay, to women exposed to legalized abortion. Meyer, Srinivasan, and Sabharwal (2021) provide an extensive review of research on the broader impact of abortion access in the U.S., concluding that abortion legalization altered women's fertility patterns and their subsequent economic and social lives. International evidence also points to the impact of large effects of abortion policy on births (Levine and Staiger 2004).

In general, abortion laws in high-income countries have been relatively stable over the last few decades. Abortion policy is thus not likely to be a major driver of the decline in fertility in the past two or three decades. The U.S. is a very recent exception, with the Supreme Court's 2022 decision in Dobbs v. Jackson Women's Health Organization, which decided that individual states can constitutionally enact restrictions on abortion access. Recent research has found that the

Dobbs decision led to a small increase in births (Dench et al. 2024), but not enough to slow the overall decline.

D. Infertility and Fertility Treatments

Over the past few decades, the number of births resulting from assisted reproductive therapies (ART) has increased considerably. IVF is the most common form of ART, but there are others, including intrauterine insemination and surrogacy. This is true in the the US, as well as in many European countries (U.S. Department of Health and Human Services, Assistant Secretary for Public Affairs 2024); Goisis et al. 2024). However, despite the large percentage increase, the share of births conceived through ART is still very low. In 2021, 86,000 births resulted from assisted reproductive therapies out of almost 3.7 million total, representing only 2.3 percent of total births. Across European countries, between 2 percent and 9 percent of births involved assisted reproductive therapies (Dattani 2025).

The availability and success of ART has the potential to help women conceive who otherwise would not be able to, either because of medical conditions or advanced age. As women delay childbirth to older ages, ART provides them with the potential ability to give birth later (Lazzari et al. 2023). Conventional wisdom suggests that fecundity discretely declines beginning at age 35 (McClelland 2020), but more recent work suggests that fecundity follows a more linear downward trend, falling at earlier ages (Geruso et al. 2023).

Though improvements in assisted reproductive therapies mean that some women who wouldn't otherwise be able to conceive or carry a pregnancy to term are now able to give birth, the technology is far from perfect. For instance, in the U.S., the success rate of IVF is 30.6 percent per embryo transfer for women between the ages of 35 and 37 (Society for Assisted Reproductive Technology 2024). That falls to 3.8 percent per embryo transfer for women aged 42 and over. The success rates of IVF are similar in other high-income countries (Smeenk et al. 2023).

But the direction of the impact of the availability of assisted reproductive technologies on completed or cohort fertility is conceptually ambiguous. The short-term and long-term effects of expanded access to IVF or improvements in ART technology may differ. In the short term, the expected effect of such technology is an increase in fertility among women with limited fecundity, typically women near the end of their childbearing years.

Empirical evidence supports this prediction. For instance, Buckles (2013) shows that expanded insurance coverage of IVF leads to an increase in multiple births (meaning, twins and triplets) to women over age 30. Schmidt (2007) finds that state IVF insurance coverage mandates are associated with an increase in first births to women over age 35. However, both these findings are about period-specific effects, not cohort level completed fertility.

In the long term, the availability of such technology may induce a "moral hazard" effect. Young adults may further delay childbearing with overly optimistic perceptions about the effectiveness of infertility treatments. Consistent with this possibility, Abramowitz (2014) documents a delay in marriage in response to increased coverage of fertility treatments. Machado and Sanz-de-

Galdeano (2015) find that IVF insurance coverage mandates in the US lead to an increase in the age of first birth with no associated change completed fertility.

Despite the relatively low probability of natural fecundity at older ages, and the relatively low success rates of these technologies, many women in their late 30s still report intending to have a child (Sobotka and Beaujouan 2018; and Beaujouan and Sobotka 2022). The link between assisted reproduction technology, perceptions about pregnancy probabilities, and intended and realized childbearing is an area that warrants more research.

E. Biological and Environmental Factors

Changes in biology and environmental factors may also have affected the likelihood of becoming pregnant. Swan and Colino (2021) report that sperm levels among men in Western countries have plummeted over the past several decades and they posit that lifestyle and environmental factors have contributed to this decline. They focus on endocrine disruptors – chemicals that interfere with hormonal signaling – that are pervasive in consumer goods, food packaging, and industrial byproducts. Inam (2025) reviews evidence indicating that microplastics have a detrimental impact on women's reproductive health.

That said, it does not appear that the scientific community has reached a consensus that these factors have a causal effect on fertility (Skakkebæk et al. 2022). We acknowledge limited expertise in these issues and are unable to provide a formal assessment of this evidence. We present them here for the sake of completeness, and to call attention to this topic as an area where more research is warranted.

F. Takeaways

Our review of the evidence in this section leads us to conclude that access to effective contraception, abortion, and fertility treatments are important determinants of fertility outcomes on a micro level. It is unlikely, though, that a change in access to any of these technologies has been a major driver of the decline in fertility in high-income countries over the past few decades. Is it an open question as to why there is a widespread gap between intended fertility and realized fertility and what the causes of this gap are. Future work should investigate the mechanisms driving the wedge between stated fertility intentions and realized fertility and consider the implications for fertility trends and policy responses.

VII. FINAL DISCUSSION

We tentatively conclude that the decline in fertility across recent cohorts in high-income countries is likely the result of evolving norms, expanding choices, and the role of broad social and economic influences. This multi-faceted cohort-based explanation contrasts with narrower period-specific explanations focused on the role of prices, income, and the opportunity cost of women's time. Those standard types of explanations are likely important at a micro level, but to understand the widescale decline in fertility and rise in childlessness across recent cohorts requires a wider lens.

Beyond this tentative conclusion to the posed title question, we offer the following additional suggestions for future research among economists interested in this area of study -

First, future work in economics into the decline in fertility would benefit from more fully integrating demographic insights. As noted above, demographers have often focused on the mechanics of fertility trends and have long emphasized the importance of understanding lifecycle patterns in fertility at the cohort level, including distinctions between timing, total number of children ever born, and childlessness. Economists often emphasize the causal behavioral determinants of fertility outcomes. Both perspectives are essential for a comprehensive understanding of fertility patterns and the integration of the two is likely to be the most productive path forward for advancing understanding.

Second, a challenge for economic research going forward is that the empirical methods we often rely on for causal identification are not always well-suited for studying changes across cohorts, nor the impact of widespread social and cultural changes. In our proposed framework of "shifting priorities," we acknowledge endogenous preference formation and the influence of social norms and prevailing institutions. A focus on causal identification in empirical economics is central to modern empirical work. To be sure, we are big fans of the "credibility revolution" and have applied those methods in our own research. However, the demands of causal identification often lead to a focus on the immediate impact of period-specific factors. But as noted throughout this paper, many key questions that remain to be answered in this area are about cohort-level changes and the role of less immediate and discrete changes.

In addition, a typical approach to identifying period-specific effects might generate misleading or limited policy lessons. Consider an intervention that relaxes some constraints on having a child at a point-in-time. Younger women—say, in their late teens or early 20s—may incorporate that change into their long-term decision making, but they may not respond immediately. Meanwhile, women in their early 30s may be less responsive, having already made many related life choices (regarding careers, relationships, lifestyle, etc.). In such cases, we might observe little to no immediate effect, even if the policy ultimately influences lifetime fertility.

This suggests that our empirical tools may sometimes be biased against identifying the true, long-term impact of interventions that are designed to increase completed fertility. In response to some policy change, perhaps younger women will have more children in their late 20s or early 30s than they would have had otherwise (which doesn't reflect a timing change). If so, this could be an effective policy, just not now. In other ways, they may be biased in favor of finding that the intervention increases completed fertility. A policy change may lead women to move up the timing of a birth to respond to some incentive, an effect that the methodology might capture, but it could result in the same number of children over their childbearing years, which might be missed. Our methods may conclude that this policy "worked," even though completed fertility was unaffected.

Third, it is important to recognize the international nature of the phenomenon of declining fertility. Fertility rates are declining—or stagnating at low levels—across virtually all high-income countries. This pattern suggests that the underlying causes are unlikely to be country specific. Our review finds considerable cross-national similarity in the effectiveness of various interventions, despite very different institutional contexts. At some point, we may need to recognize that people have similar preferences, priorities, and constraints around parenting, regardless of their country of residence, and their choices may be shifting in similar ways.

Fourth, our discussion offers insights into ongoing policy debates around pro-natalist interventions. If a society decides that increasing the birth rate is a priority, how should it proceed? The short answer is that there is no single policy lever that would reliably boost fertility, certainly in the short run. That said, our cohort-based framework implies that to be effective at boosting completed fertility, policies must influence the decisions women make early in their reproductive lives. Interventions targeting women well into their childbearing years are less likely to have large effects, as many life choices will have already been made. This may explain why past empirical studies often fail to find large effects of pro-natalist policies. Incremental policy changes or interventions are unlikely to have sizable effects, and boosting fertility will likely require much larger changes that alter the lifetime calculation to have and raise a child or multiple children given prevailing options, constraints, and social norms.

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