Explaining the Fertility Crunch: The Roles of Intergenerational Income Mobility and Shifting Preferences

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Abstract

Assuming that preference on fertility is transmitted from earlier generation to the next, the high fertility preference group is expected to eventually dominate creating a homogeneous high preference society as the group is more likely to have more kids leading to faster growth in population than other preference group. However, a significant body of surveys reveals pronounced within-country heterogeneity in fertility ideals and many post-war societies exhibit persistently lowering pattern in fertility. In this paper, I propose a fertility model that children first acquire fertility ideals through cultural transmission, either from parents (vertical) or from the broader adult population (oblique). They then adjust these ideals after comparing their expected income with their parents'. Upward mobility can raise preferences, while downward mobility lowers them. This mobility shock offsets the evolutionary advantage of high-fertility groups, preserving preference diversity and driving the aggregate fertility rate to a stable ultra-low equilibrium. The framework highlights intergenerational mobility as a central, yet overlooked, determinant of fertility dynamics and offers a critical perspective on projections that anticipate a rebound in fertility without accounting for these mechanisms.

Keywords: Fertility, Intergenerational Mobility, Cultural Transmission, Evolutionary Mechanisms, Preference Formation

JEL Codes: J13, J62, D91, Z13

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1 Introduction

Childbearing represents a deeply personal decision that nevertheless commands considerable social and economic significance. The relationship between income and family size has been extensively examined in the literature since Malthus (1967) and formalized by Becker (1960), while scholars have closely investigated how the expansion of women's rights and their increased labor-force participation influence fertility choices. In macroeconomic research, population dynamics have long been recognized as closely linked to economic growth. Yet, as in much of modern economics, studies have typically assumed homogeneous preferences over childbearing and focused on how individual's fertility decisions vary with socioeconomic conditions.

Given the substantial costs associated with childbearing, it is indeed plausible that individuals determine their fertility decisions in accordance with their prevailing economic circumstances. However, a growing body of empirical evidence indicates that fertility preferences are far from homogeneous. For instance, rich data sets such as World Fertility Survey have made preferences quantifiable. Respondents' preference varies from zero to as many as ten children. Independent of individual economic circumstances, culturally distinct groups within the same society may exhibit systematically different attitudes toward childbearing. Hakim (2003) has suggested a theory that emphasizes individual lifestyle preferences as primary determinants of fertility decision. Thanks to modern contraception, declining child mortality, and the broader availability of safe abortion, individuals now possess far greater control over whether—and when—they realize their desired family size. As these technological and medical advances expand personal autonomy, fertility preferences becomes an ever more critical lens through which to understand contemporary fertility outcomes.

This study proposes a framework that incorporates the economic optimization aspect of fertility choice and heterogeneity in fertility preferences, and it further extends this framework into a dynamic model that preference formation is partially driven by intergenerational income shocks. Unlike traditional fertility models that assume static or exogenously given preferences, this framework endogenizes preference adjustments based on upward or downward income mobility relative to one's parents. This mechanism captures how agents revise their fertility ideals in response to changing economic expectations, adding a dynamic and socioeconomically grounded dimension to the modeling of family size decisions. To the best of my knowledge, no existing theoretical work develops a dynamic model in which fertility is endogenously determined by culturally transmitted preferences that themselves evolve in response to economic shocks.

Preference formation in this paper follows a two-stage mechanism. The first stage–cultural transmission–builds on the seminal work of Cavalli-Sforza and Feldman (1981) and Boyd and Richerson (1985) which operates in two channels. The vertical channel transfers preferences directly from parents to children. The oblique channel is activated if vertical socialization fails; in that case, the child instead adopts the preference of a randomly encountered adult, with probabilities proportional to the current distribution of preferences in the adult population.

After completing this initial stage, adolescents enter adulthood and compare their own prospective economic posi-

tion with that of their nearest reference adults—their parents. If they expect to provide their children with a standard of living similar to the one they themselves experienced, they retain their first stage preference. If, however, a disparity is anticipated, they adjust that preference upward or downward accordingly. The second stage therefore introduces a shock stemming from intergenerational income mobility, effectively modeling preference revision through comparison with a salient reference group. This paper incorporates both stages into a unified dynamic framework to analyze how intergenerational economic differences systematically reshape fertility preferences over time.

Introducing intergenerational income mobility shocks produces two central results. First, higher mobility lowers long-run fertility because children of high-fertility parents are not guaranteed to inherit their ideals, and many instead adjust downward in line with income comparison to their parents'. Second, cultural heterogeneity in fertility preferences is preserved, even though high preference groups enjoy an evolutionary advantage. Both results stem from the same mechanism that mobility shocks offset the dominance of high preference groups by continuously reshuffling preferences across generations. Combined with the weakening influence of the family in modern societies, this mechanism helps explain why contemporary societies not only sustain preference heterogeneity but also exhibit lower fertility rates than traditional societies.

The remainder of the paper is organized as follows. Section 2 reviews the related literature and presents key stylized facts. Section 3 outlines the model, including the household optimization problem, preference formation, and the role of income mobility. Section 4 analyzes the theoretical dynamics of population and preference evolution under alternative parameterizations, contrasting modern and traditional societies. Section 5 provides counterfactual simulations to highlight the role of intergenerational mobility shocks. Section 6 discusses the findings and concludes.

2 Related Literature and Stylized Facts

The economic analysis of fertility spans both dynamic and cross-sectional and perspectives. Extensive evidence documents the demographic transition: since the late 1960s fertility has declined steadily in most countries, with some now trapped in an "ultra-low fertility" regime. Figure 1 plots total fertility rates (TFRs) for the United States, South Korea, Japan, the European Union, and China from 1960 onward. China and South Korea exhibit the steepest contractions, driven in part by aggressive family-planning programs, famously known as One Child Policy in China, whereas the European Union, Japan, and the United States show more gradual declines. Some of a leading explanation in this declining trend in fertility are the increase in women's relative wages (Galor and Weil, 1993), and changes in the costs of and returns to child quality (Goldin and Katz, 2000). More recently, Kearney and Levine (2025) claim that very low fertility in high-income countries primarily reflects evolving preferences rather than economic constraints or institutional shortcomings.

As fertility decline first emerged in the early-industrialized countries, the demographic transition came to be viewed as a by-product of successful economic growth and structural transformation. The negative association between living

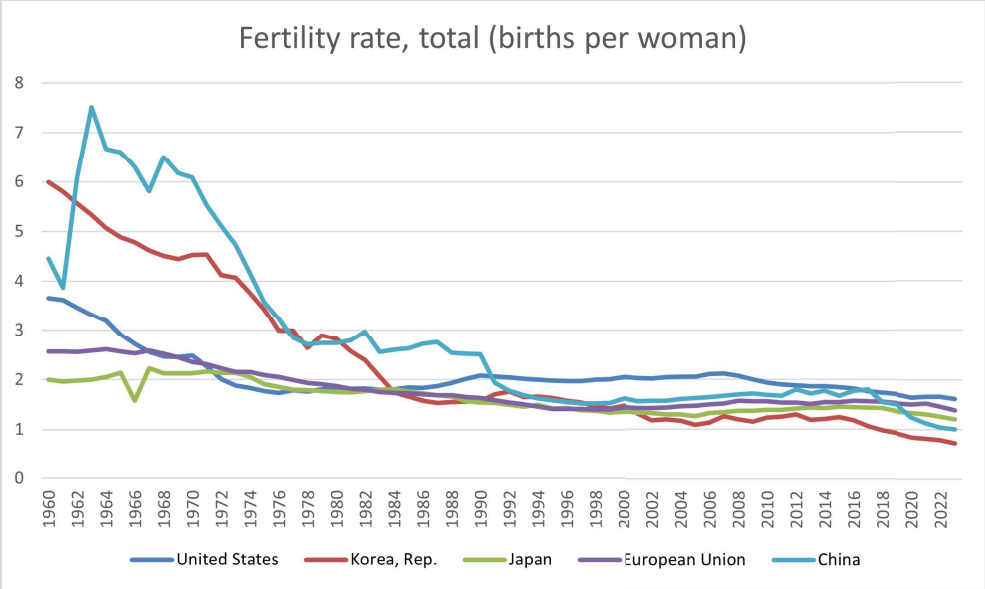


Figure 1: Total Fertility Rate Trend in Selected Countries

Notes: Total fertility rate represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with age-specific fertility rates of the specified year.
Source: World Bank, World Development Indicators (SP.DYN.TFRT.IN), retrieved on Aug 24th, 2025 from https://data.worldbank.org/indicator/SP.DYN.TFRT.IN

standards and fertility appears consistently both across countries at a given point in time and within countries. Figure 2 illustrates this pattern for the United States. For every birth cohort from 1828 to 1958, higher household occupational income is associated to fewer children ever born, confirming a robust inverse income–fertility gradient.

Becker (1960) identified the quality–quantity trade-off as the principal mechanism behind the negative income–fertility gradient observed in industrialized societies. Treating children as durable goods, he posited that parents both ”purchase” and invest. Parents derive utility from the number of children they have (“quantity”) and from the resources devoted to each child (“quality”). Under the assumption of exogenous preferences, Becker and Lewis (1973) formalized this insight, a higher income might raise the cost of child quality—private schooling, individual bedrooms, and other costly investments—so that if the income elasticity of demand for quality is sufficiently high, richer parents optimally choose fewer children. Education, the principal vehicle for human-capital accumulation, illustrates this mechanism. Dynamic extensions, such as Barro and Becker (1989) and the overlapping-generations model of De La Croix and Doepke (2003), embed this quality–quantity framework in intertemporal settings to study long-run demographic and growth outcomes.

Homogeneous preferences are assumed in most economic models with fertility choices, yet a growing body of evidence indicates otherwise. Hakim’s (2003) Preference Theory argues that women differ systematically in lifestyle orientation—home-centered versus work-centered—and that these orientations predict both stated fertility ideals and realized fertility. Figure 3 corroborates this claim using a nationally representative survey of married Korean women aged 15-49. Respondents assessed the “optimal” number of children under eight hypothetical life goals. As the

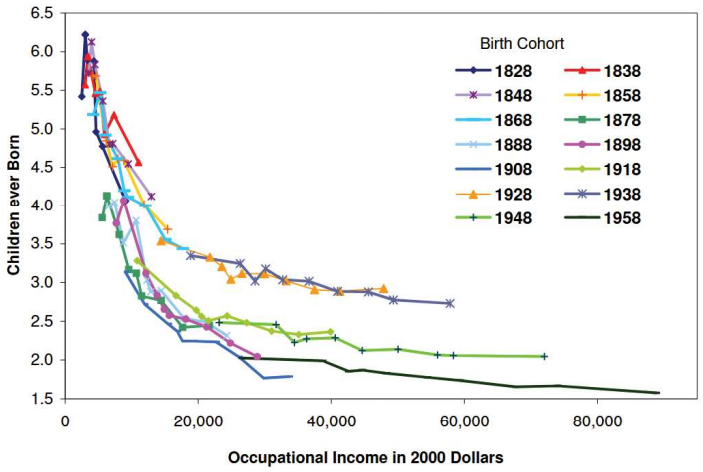


Figure 2: Occupational Income in Year 2000 U.S. Dollars (Price-Adjusted)

Note: Figure from Jones and Tertilt (2008), Figure 4. Income is occupational income, which is constructed based on husbands' occupations and converted into year 2000 U.S. Dollars.

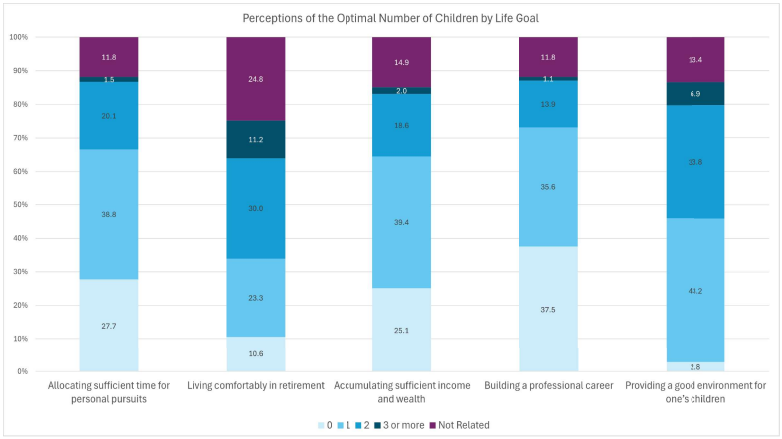


Figure 3: Perception of the Optimal Number of Children by Life Goal

Source: Family and Fertility Survey(2018), Statistics Korea

life goal becomes more self- or career-oriented (e.g., "building a professional career," "allocating sufficient time for personal pursuits"), responses shift toward having no children, underscoring the tight link between lifestyle orientation and fertility ideals. Figure 4 reports the distribution of desired family size among married Korean women aged 19–49. The mean fell from 2.25 in 2015 to 1.98 in 2021, yet considerable dispersion persists. Given Korea's status as one of the world's most ethnically homogeneous societies, even greater variation would be expected in countries with broader cultural diversity. Preferences are also flexible. Early demographic studies (Ryder 1973; Lee 1980) describe fertility ideals as a "moving target," and more recent work shows that preferences adjust to economic conditions and uncertainty (Trinitapoli and Yeatman, 2017).

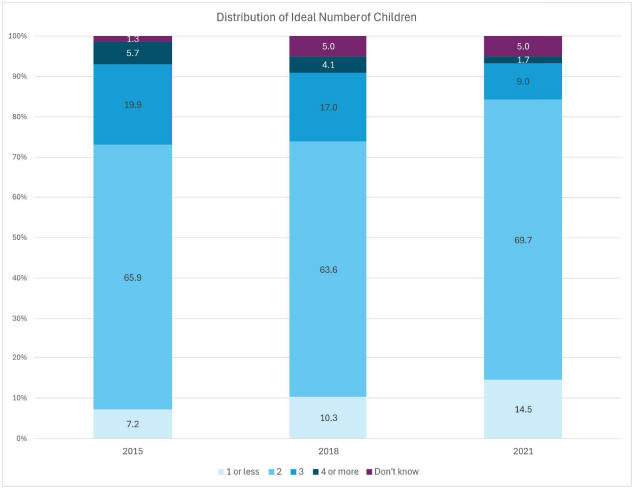


Figure 4: Distribution of Ideal Number of Children in South Korea

Source: Family and Fertility Survey(2015, 2018, 2021), Statistics Korea

This study builds on the cultural-transmission framework first mathematically formalized in evolutionary biology by Cavalli-Sforza and Feldman (1981) and, in anthropology by Boyd and Richerson (1985). Both describe a process of intergenerational cultural transmission within a continuum of agents whose cultural transmissions are shaped by direct vertical socialization from parents and oblique socialization in society at large. The population dynamics are highly simplified, with asexual reproduction and each parent having only one child. Bisin and Verdier (2001) introduced the first economic model of cultural transmission, which treats vertical transmission as a rational choice made by the parent. They also enrich their model by adding fertility choice to the parent's decision problem. Gobbi (2013) demonstrates that heterogeneity in preferences and its transmission can explain why voluntary childlessness and average fertility are not always negatively correlated. Economy-wide shocks that lower the demand for children—such as a narrowing gender pay gap—reduce fertility more among low-taste for children families than among high-taste families, thereby lowering proportion of childlessness even as mean fertility falls. Empirical evidence underscores the importance of both vertical and oblique transmissions in fertility preference: fertility behavior is positively correlated across generations (Murphy and Knudsen, 2002), mothers' attitudes shape those of their children (Farré and Vella, 2013), and exposure to high-achieving peers influences educational choices (Porter and Serra, 2020). Given the close association between women's life goals and fertility norms documented in Figure 3, these findings suggest that fertility preferences themselves are routinely transmitted across and within generations. Alesina et al. (2013) show how historical shocks to gender norms, such as traditional plough use, still affect contemporary gender attitudes and hence fertility ideals.

Traditional economic research views fertility as a driver of intergenerational mobility. In a perspective of resource transfers, larger family size dilute parental investments, thereby limiting upward mobility (Altonji et al., 1997). This perspective has motivated family-planning campaigns in many developing countries (Chu and Koo, 1990). This pa-

per reverses the direction of pressure by asking how mobility itself reshapes fertility preferences. Easterlin (1987), although not explicitly focused on intergenerational mobility per se, have suggested similar mechanism. Young adults evaluate their job prospects, such as employment opportunities, relative to those their parents experienced, and that this comparison grounded in childhood experiences shapes their fertility decisions. Cohorts born during high-fertility periods encounter more intense labor-market competition, and anticipating limited opportunities, they opt for smaller families which in turn produces smaller cohorts. Cohort size is therefore endogenous because fertility affects economic conditions, and those conditions subsequently influence fertility behavior. A recent work shows that children's career aspirations track parental occupations (Oliveira et al., 2020). Downward mobility has been found to influence political attitudes (Mitrea et al., 2021), suggesting that mobility shocks plausibly affect broader preference formation as well. The current paper formalizes this intuition by embedding an income-mobility shock into a cultural-transmission model of fertility.

3 Model

3.1 The Economy

The economy is modeled as a two-period overlapping generation (OLG) framework with L_t adult agents present in each period. Family is assumed to be monoparental. Upon reaching adulthood, each individual of type i makes an optimal decision over consumption (C_t^i) and the number of children (N_t^i). The size of a family is a discrete choice from the set $S = \{0, 0.5, 1, 1.5\}$. Given the assumption of a monoparental family, a choice of 0.5 children in this context corresponds to having one child in a biparental setting. Individuals are categorized by their preferred family size, which defines their type. The number of children matters to each agent in two ways. First, it is costly so it competes with consumption over limited resource, and second, agents derive the most utility when their fertility choice matches their ideal.

Adults of type i in time t maximizes utility function given as

$$W_t^i(C_t^i, N_t^i) = C_t^i + I_t^i(N_t^i) \tag{1}$$

Preference proximity function $I_t^i(N_t^i)$ illustrates the utility of having the number of children similar to an agent's preference. It penalizes deviations from the agent's ideal family size i.

$$I_t^i(N_t^i) = -(N_t^i - i)^2 + \max_{\substack{i \\ N^i \in S}} (N^i - i)^2 \tag{2}$$

The function $I_t^i(N_t^i)$ is strictly decreasing in the absolute deviation $|N_t^i - i|$. That is, utility declines as the gap between the realized and ideal number of children widens. This specification parallels the framework in Akerlof and

Kranton (2005) in which individuals experience disutility when their actions conflict with their identity. In this model, an individual's type is defined by fertility preference. Therefore, an agent makes the fertility choice that yields the highest overall utility balancing the satisfaction from aligning with the ideal family size against the consumption loss due to childrearing cost. Unlike Akerlof and Kranton (2005), the asymmetry in $(N_t^i - i)^2$ imposes a larger penalty when the realized family size deviates more substantially from the preferred size i. The final term ensures that the function remains nonnegative over its entire domain.

Unlike conventional economic fertility frameworks such as the Barro–Becker model and De La Croix and Doepke (2003), the present model omits an explicit altruism term in the utility function.[1] Instead, adult agents derive utility solely from aligning their realized number of children with their own fertility preference. At first glance, this assumption may appear unduly individualistic, given that childbearing is often viewed as an intrinsically social and altruistic act. The model addresses this concern in the second stage of preference formation (discussed in the next section). There, individuals revise their fertility ideals after considering whether they can provide an adequate environment for their prospective children. This income-contingent adjustment implicitly captures altruistic motives, because the final fertility decision reflects concern for the well-being of the next generation.

Let Ω_t^i denote the labor income of an agent of type i. In this model, income is interpreted in two complementary ways; as a measure of lifetime earnings and as an indicator of income quartile, where $\Omega_t^i \in \{1,2,3,4\}$. A higher Ω_t^i therefore implies both greater income in absolute level and a higher position in the income distribution. To embed Becker's (1960) quality-quantity trade-off, each birth is assumed to entail a cost equal to η fraction of the parent's labor income, reflecting the time intensity of child-rearing. Since the income Ω is taken as given, not only the time spent for raising children but the cost of goods is also eventually be represented in terms of proportion of income. Therefore, the distinction between time and goods cost of children in this model is unnecessary. The cost increases linearly with the number of children. The resulting budget constraint given their preference and income is:

$$C_t^i + \eta \Omega_t^i N_t^i = \Omega_t^i \tag{3}$$

Every adult born in $(t-1)$ chooses C_t^i, and N_t^i to maximize equation (1) subject to equation (3). Decision rules are:

[1] For example, children's utility appears in the parent's utility function of Barro and Becker (1989) and De La Croix and Doepke (2003) introduces a parent's utility function that derives utility from child quality, which is referred as a "warm glow" type.

Income \ Preference	i=0	i=0.5	i=1	i=1.5
Ω=1	0	0.5	1	1.5
Ω=2	0	0.5	1	1.5
Ω=3	0	0	0.5	1
Ω=4	0	0	0.5	1

Table 1: Decision rule with basic parameter set of $p = 0.5$ and $\eta = 0.2$

$$(N_t^{i=0}, C_t^{i=0}) = (0, \Omega_t^i)$$

$$(N_t^{i=0.5}, C_t^{i=0.5}) = \begin{cases} (0, \Omega_t^i) & \text{if } \Omega > \frac{2}{\eta}(I_t^{0.5}(0.5) - (I_t^{0.5}(0)) \\ (0.5, (1-0.5\eta)\Omega_t^i) & \text{if } \Omega \leq \frac{2}{\eta}(I_t^{0.5}(0.5) - (I_t^{0.5}(0)) \end{cases}$$

$$(N_t^{i=1}, C_t^{i=1}) = \begin{cases} (0, \Omega_t^i) & \text{if } \Omega > \frac{2}{\eta}(I_t^{1}(0.5) - I_t^{1}(0)) \\ (0.5, (1-0.5\eta)\Omega_t^i) & \text{if } \frac{2}{\eta}(I_t^{1}(1) - I_t^{1}(0.5)) < \Omega \leq \frac{2}{\eta}(I_t^{1}(0.5) - I_t^{1}(0)) \\ (1, (1-\eta)\Omega_t^i) & \text{if } \Omega \leq \frac{2}{\eta}(I_t^{1}(1) - I_t^{1}(0.5)) \end{cases}$$

$$(N_t^{i=1.5}, C_t^{i=1.5}) = \begin{cases} (0, \Omega_t^i) & \text{if } \Omega > \frac{2}{\eta}(I_t^{1.5}(0.5) - I_t^{0.5}(0)) \\ (0.5, (1-0.5\eta)\Omega_t^i) & \text{if } \frac{2}{\eta}(I_t^{1.5}(1) - I_t^{1.5}(0.5)) < \Omega \leq \frac{2}{\eta}(I_t^{1.5}(0.5) - I_t^{1.5}(0)) \\ (1, (1-\eta)\Omega_t^i) & \text{if } \frac{2}{\eta}(I_t^{1.5}(1.5) - I_t^{1.5}(1)) < \Omega \leq \frac{2}{\eta}(I_t^{1.5}(1) - I_t^{1.5}(0.5)) \\ (1.5, (1-1.5\eta)\Omega_t^i) & \text{if } 0 \leq \Omega \leq \frac{2}{\eta}(I_t^{1.5}(1.5) - I_t^{1.5}(1)) \end{cases}$$

To facilitate better understanding of this decision rule, an example with specific parameter values of $p = 0.5$ and $\eta = 0.2$ are presented in Table 1. Each entry in Table 1 shows the optimal fertility choices of agents in a given preference-income combination. For instance, an agent who prefers to have 0.5 child and belongs to income group 2 chooses to have 0.5 child, whereas the same preference paired with income group 3 yields zero children.

The first column of table 1 confirms that agents whose final preference is not to have children, the optimal choice is always $N_t^0 = 0$ in any income group. This is because not only do they derive the greatest utility from aligning their fertility behavior with their preferences, but they also avoid incurring any childbearing costs. In general, for a given preference type, the utility gained from having additional children must outweigh the cost of childbearing in order to larger family size to be optimal. In the case of those with zero preference, the utility is maximized by not having children, and thus there is no incentive to deviate from this choice. More broadly, no individual chooses to have more children than her stated preference. Across all preference types, agents with higher income are more likely to have fewer children, or even none at all. This pattern is driven by the increasing opportunity cost of time. Wealthier households—facing a higher marginal child cost—choose no more and often fewer children than poorer households with the same fertility preference i. As η increases, the cost of having children rises across all income levels, leading to a general decline in fertility.

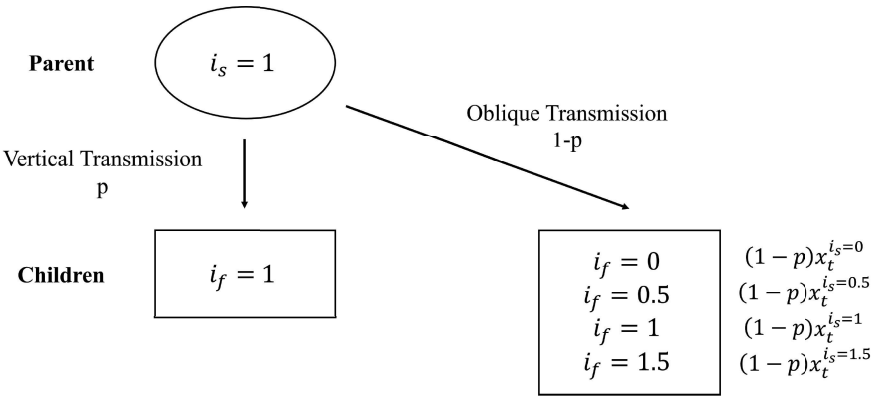


Figure 5: First Stage Preference Formation: An Example of Vertical and Oblique Transmission for Children Whose Parent's Preference is 1

3.2 Evolution

3.2.1 Preference Formation

A child's preference on family size is shaped through a two-stage formation process. i_f denotes the first stage preference and i_s denotes the final preference of an agent after the entire process. The first stage resembles a socialization process in the spirit of Cavalli-Sforza and Feldman (1981) and Boyd and Richerson (1985). Initially, the child is exposed to familial socialization. Continuous experience and exposure during childhood play a crucial role in shaping an individual's identity. While parents in this model do not actively attempt to transmit their preference to their children, there exists a passive influence–referred to as vertical transmission–that affects the children's preference formation. With probability $p \in [0, 1]$, a child inherits the same preference regarding the ideal number of children as her parent.

If the familial socialization fails, the child is randomly matched with a societal role model in the society and adopts that individual's traits. With probability $x_t^{i_s}$ the child is matched with an adult of preference type i_s where $x_t^{i_s}$ denotes the proportion of type i_s adults in the population at time t, and $\sum_{i_s} x_t^{i_s} = 1$. Thus, the first stage of preference formation consists of both vertical and oblique transmission, as illustrated in Figure 5.

The transition probabilities of the first stage can be expressed as follows:

$$P_t^{i_s,i_f} = p + (1-p)x_t^{i_s} \tag{4}$$

$$P_t^{i_s,j_f} = (1-p)x_t^{j_s} \tag{5}$$

Let $P_t^{i,j} \in [0, 1]$ denote the probability that a parent of type i has a child of type j in the first stage. The probability for a child to have the same preference as her parent increases with p. Cultural differences may lead to variations in p; for instance, some familial cultures emphasize close-knit family bonds and spend more time engaging in family activities, which likely increases parental influence on children's preferences. Conversely, in cultures where children

spend more time outside the home–such as in school or extracurricular activities–children are more likely to develop their preference independently from their parents, leading to a lower value of p.

When a child seeks a role model outside the family, the popularity of preference within the broader society becomes important. In such cases, the probability that a child adopts preference type i increases with the proportion of type i adults in the population, denoted by $x_t^{i_s}$, regardless of the parent's type. It is important to note that even if vertical transmission fails, a child may still acquire the same preference as her parent. This can occur if the parent's preference is sufficiently prevalent in society, allowing the child to adopt it through oblique transmission by encountering another adult of the same type.

The second stage of preference formation introduces an intergenerational income shock, which constitutes one of the novel contributions of this paper. A young agent's preference may be either reinforced or revised depending on the perceived difference between her parents' income and her own expected lifetime income. As agents enter their adulthood, they compare their expected lifetime income to their parent's. When an agent anticipates that her lifetime income will be lower than that of her parents, she adjusts her preference downward by one step. This adjustment reflects not only the recognized costliness of childbearing, but also a belief that she may not be able to offer her children the same level of resources and opportunities she experienced during her own upbringing. Conversely, if an agent expects her income to exceed that of her parents–also interpreted as upward intergenerational mobility across income quartiles–she shifts her preference upward by one category. Her personal experience of socioeconomic advancement instills a more optimistic view of the future and strengthens her willingness to invest in a larger family, as she perceives the world as a more promising place in which to raise children.

Following is a specific example. Consider, for instance, a young agent who belongs to the group $(i = 1, m = 1)$ after the first stage. If her parent's income was higher–for example, in income group 3–then her final preference will be revised downward to $i = 0.5$ in the second stage. Since she is already in the lowest income group, her preference cannot be adjusted to $i = 1.5$, as it is not possible for her to have parents in a lower income group than her own.

The second stage of preference formation is characterized in below equation.

$$\text{Final } i_s = \begin{cases} min\{i_f + 0.5, 1.5\} & \text{if my parent's } \Omega < \text{my } \Omega \\ i_f & \text{if my parent's } \Omega = \text{my } \Omega \\ max\{i_f - 0.5, 0\} & \text{if my parent's } \Omega > \text{my } \Omega \end{cases} \tag{6}$$

In this framework both the realized fertility choice and the underlying preference respond to cultural and economic forces. The analysis also imposes an upper bound on fertility preference, so upward mobility can increase the desired family size only within that limit. This constraint is plausible because raising children demands substantial time and resources, which agents are aware of, and stated intentions are unlikely to grow without bound. A milder assumption, such as upward revisions being harder than downward ones, would lead to results that are qualitatively similar to those

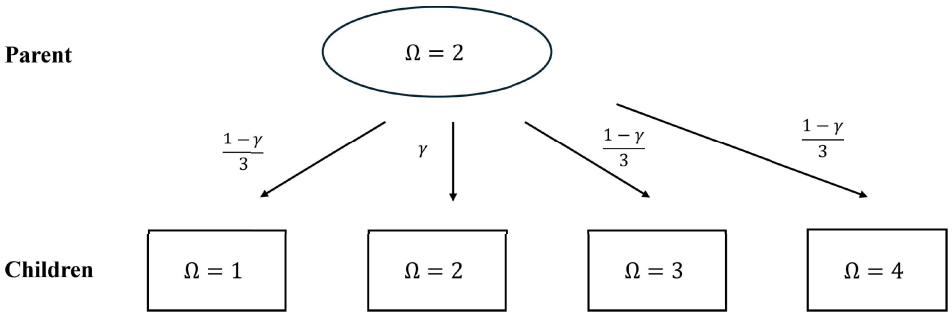


Figure 6: Income mobility rule with example when the parent's income is $\Omega = 2$

presented here.

3.2.2 Intergenerational mobility

Intergenerational economic mobility is characterized by an exogenously given parameter, γ, and follows a Markov process. Each agent has a probability γ of belonging to the same income quartile as her parent. Alternatively, an agent is expected to fall into a different income quartile with probability $(1-\gamma)\frac{1}{3}$. An example of the income distribution rule is illustrated in Figure 6. Therefore, γ can be interpreted as an inverse intergenerational mobility parameter: a higher γ corresponds to lower intergenerational mobility. All else equal, higher (lower) intergenerational mobility is associated with more(fewer) agents having preference that differ from their parents. Alternative mobility rule can be easily implemented in this model as long as they adhere to a Markov process. More complicated income mobility structure or models with endogenous mobility, are left for future study.

A crucial distinction in this model is that economic conditions—specifically income dynamics—affect not only the agent's budget constraint, but also her preference formation. In standard household optimization models, income typically enters the decision problem only through the budget constraint, shaping feasible choices but not the underlying preferences. In contrast, this model allows income to play a dual role. It influences the agent's economic capacity through the budget constraint and simultaneously alters the subjective desirability of fertility outcomes through intergenerational income comparisons. Agents do not merely optimize given static preferences; instead, preferences themselves evolve in response to changes in expected lifetime income relative to parental benchmarks. As such, income dynamics shape not just what agents can afford, but what they aspire to—highlighting a psychological and cultural dimension of fertility behavior that is often overlooked in literature. As will be demonstrated in Section 4, this shock is pivotal in curtailing the evolutionary advantage of the high-fertility-preference group, thereby averting explosive population growth.

3.2.3 The Dynamic of Preference Evolution

Now we combine both dimensions of the model, preference and income. Let $z_t^{i,m}$ denote the absolute size of population in period t who hold preference i and belong to income group m. As agents experience the first stage of preference formation during their childhood, $z_t^{i_f=i,m}$ refers to the cohort of young population in period t who, after completing the first stage of socialization, hold preference i and belong to income group m. In contrast, $z_t^{i_s=i,m}$ represents the size of adult generation at time t that has passed through both stages of preference formation, so that i is their final preference and has income level of m. Following equation describes the evolution of population types in the first step of preference formation.

$$\begin{aligned} z_{t+1}^{i_f=i,m} = & \underbrace{\gamma(p+(1-p)x_t^{i_s=i})N^{i,m}z_t^{i_s=i,m}}_{\text{Same preference and same income parents}} \\ & + \underbrace{(1-\gamma)\frac{1}{3}(p+(1-p)x_t^{i_s=i})\sum_{s\neq m}N^{i,s}z_t^{i_s=i,s}}_{\text{Same preference and different income parents}} \\ & + \underbrace{\gamma(1-p)x_t^{i_s=i}\sum_{j\neq i}N^{j,m}z_t^{i_s=j,m}}_{\text{Different preference and same income parents}} \\ & + \underbrace{(1-\gamma)\frac{1}{3}(1-p)x_t^{i_s=i}\sum_{j\neq i}\sum_{s\neq m}N^{j,s}z_t^{i_s=j,s}}_{\text{Different preference and different income parents}} \end{aligned} \tag{7}$$

Each segment of equation represents the inflow to the group ($i_f = i, m$) from different family background. The second stage is described in equation (8).

$$\begin{aligned} z_{t+1}^{i_s=i,m} = & (z_{t+1}^{i_f=i-0.5,m}| \text{ Parent's income} < \text{Own income}) \\ & + (z_{t+1}^{i_f=i_s,m}| \text{ Parent's income} = \text{Own income}) \\ & + (z_{t+1}^{i_f=i+0.5,m}|\text{Parent's income} > \text{Own income}) \end{aligned} \tag{8}$$

Since agents live only two periods and make the fertility choice only during their adulthood, fertility f can be measured as the rate of change in adult population each year. This is equal to weighted average fertility rate of each characteristic groups which is the right hand side of equation (9).

$$f_t = \frac{L_{t+1}-L_t}{L_t} = \sum_i\sum_m N^{i,m}L_t z_t^{i,m} = \sum_i\sum_m N^{i,m}x_t^{i,m} \tag{9}$$

4 Analysis

One of the trivial result is that $z_t^{i,m} = 0$ for any i and m is a steady state. Some interesting analytic expectation on cultural heterogeneity and fertility rate are also possible.

Based on the simulation results, with a positive level of intergenerational mobility, cultural heterogeneity persists in equilibrium even though high-fertility types have an evolutionary edge. Vertical transmission with probability p enlarges the high-preference group, and oblique transmission reinforces any majority trait when vertical transmission fails. This expansion is checked by mobility-induced preference shocks. Because family-size ideals are bounded above, upward mobility cannot raise the preference of already high-preference families, whereas downward mobility can reduce their children's preferences. The resulting, presistent flow from high to lower preference types prevents complete dominance by any single group.

Comparative statistics follow directly. By equation (9), aggregate fertility is the population-weighted average of group-specific rates, so shifts in the high-preference share drive the aggregate. A higher vertical-transmission probability p raises the steady-state mass of high-fertility types and increases the fertility rate. Greater intergenerational mobility increases the frequency of preference downgrades, shrinks the high-preference share, and lowers aggregate fertility. When mobility is very low (equivalently, when the inverse-mobility parameter γ is high), the zero-preference group can vanish, yet complete takeover by the highest-preference group does not occur because mobility shocks continue to redirect some offspring toward lower preferences.

This section analyzes two contrasting settings–modern and traditional societies–that differ in social exposure, income mobility, and child-rearing costs. The goal is to explore how cultural differences map into economic structure and, in turn, shape long-run fertility patterns.

While modern economies can be characterized in various ways, one of their most distinctive features compared to premodern societies is the absence of rigid status systems. In traditional societies, economic roles and social positions are typically inherited. Children are likely to follow their parents' occupation and remain in the same household or locality. Without major external shocks, one's socioeconomic status tends to persist across generations. Although the question of whether modern societies have fully achieved equality of opportunity or meritocracy remains an open debate, this paper abstracts from such definitional controversies. Instead, it assumes that increased intergenerational economic mobility is a salient feature of modern economies and adopts this as a modeling foundation.

Another distinguishing feature of modern society is the weakening influence of the family in preference formation. Multigenerational co-residence has declined and communication technologies have enabled wider exposure. Individuals now increasingly encounter diverse role models beyond the immediate family. In traditional contexts, most socialization occurred within kin networks and culturally homogeneous communities, reinforcing preference stability across generations. In contrast, modern societies exhibit weaker vertical transmission of preferences and greater susceptibility to oblique transmission via broader social influence.

Parameters		Modern	Traditional
η	Cost of Childbearing in Terms of Time	0.2	0.1
p	Probability of Vertical Transmission	0.5	0.8
γ	Inverse Intergenerational Mobility	0.25	0.8

Table 2: Value of Parameters for Each Cases

Child-rearing costs also differ substantially. In modern societies, the baseline expectations for what constitutes adequate parenting have risen considerably. As Lawson and Mace (2011) note, post-industrial societies place greater emphasis on qualitative child outcomes—such as education, health, and social competitiveness—rather than on survival or reproductive success per se. Childbearing now involves substantial medical, educational, and opportunity costs, the latter particularly due to women's increased labor force participation. In traditional societies, however, child-rearing is often community-based, and formal education was minimal. Children were viewed as economic contributors rather than financial burdens, which often yielded a positive expected return. This section therefore assumes higher per-child costs in modern than in traditional settings.

For each case, We then hold all parameters constant except for one, and examine how steady-state outcomes respond to each variation. This comparative statics exercise provides a quantitative validation of the theoretical intuitions developed earlier. All baseline calibrations assume an even initial distribution across preference-income groups. That is, each group begins with the same population share. However, this assumption may not hold in real societies, which often start from skewed initial conditions. For example, if the majority initially holds a low-fertility preference, even the evolutionary advantage of high-preference groups may be insufficient to shift population composition. Conversely, if high-preference types are dominant at the outset, the counteracting force of economic mobility shocks may prove too weak to restrain their expansion. To explore these possibilities, we examine three extreme initial conditions. The first assumes a society composed only of individuals with preferences $i = 0$ and $i = 0.5$, while the others assume either dominance by the highest $i = 1.5$ or the $i = 1$ preference group, respectively. The exact assumed initial distributions are reported in Table 3. The simulation investigates whether the group, given this advantageous starting point and in some cases a fertility-driven evolutionary edge as well, ultimately comes to dominate the entire population.

Despite the severity of these initial conditions, the simulations show that the economy always converges to a unique steady state. This suggests that initial distribution affects the path to equilibrium, but not the destination. The long-run fertility rate and preference distribution are determined by structural parameters, not by starting conditions. That said, initial conditions do influence the transition dynamics: societies experiencing lower interim fertility rates will arrive at the same steady-state distribution with a smaller total population. Since our model centers on the tension between the evolutionary pressure of high or low-preference groups and the restraining effects of mobility shocks, we examine these transitional patterns under both modern and traditional settings.

Table 2 reports the parameter values for each case, and equation (10) presents the value of preference-proximity function given the fertility preference set.

Case	i=0	i=0.5	i=1.0	i=1.5
Baseline	0.25	0.25	0.25	0.25
Case 1	0.4	0.6	0	0
Case 2	0	0	0	1
Case 3	0	0	1	0

Table 3: Different Initial Distributions for Each Cases

Case	Parameters	$x^*_{i=0}$	$x^*_{i=0.5}$	$x^*_{i=1}$	$x^*_{i=1.5}$	f
Modern	$p = 0.7, \gamma = 0.25, \eta = 0.2$	0.0189	0.1118	0.3971	0.4722	0.9129
	$\boldsymbol{p = 0.5, \gamma = 0.25, \eta = 0.2}$	0.0411	0.1369	0.3705	0.4515	0.8703
	$p = 0.2, \gamma = 0.25, \eta = 0.2$	0.1159	0.1878	0.3184	0.3778	0.7424
	$p = 0.5, \gamma = 0.7, \eta = 0.2$	0.0050	0.0448	0.2664	0.6838	1.1212
	$p = 0.5, \gamma = 0.5, \eta = 0.2$	0.0186	0.0927	0.3397	0.5490	0.9762
Traditional	$p = 0.9, \gamma = 0.8, \eta = 0.1$	0.0009	0.0271	0.2987	0.6733	1.3223
	$\boldsymbol{p = 0.8, \gamma = 0.8, \eta = 0.1}$	0.0018	0.0348	0.2937	0.6697	1.3156
	$p = 0.5, \gamma = 0.8, \eta = 0.1$	0.0093	0.0670	0.3076	0.6161	1.2652
	$p = 0.8, \gamma = 0.9, \eta = 0.1$	0.0003	0.0116	0.1849	0.8032	1.3955
	$p = 0.8, \gamma = 0.5, \eta = 0.1$	0.0118	0.1001	0.4119	0.4761	1.1762

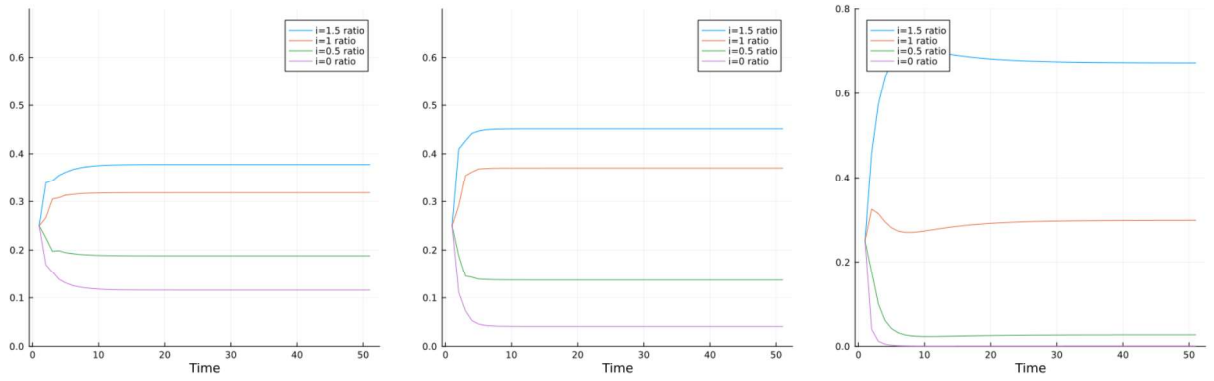
Table 4: Steady State Value Under Each Cases

$$I(N_t^i) = \begin{cases} 2.25 & \text{if } |N_t^i - i| = 0 \\ 2 & \text{if } |N_t^i - i| = 0.5 \\ 1.25 & \text{if } |N_t^i - i| = 1 \\ 0 & \text{if } |N_t^i - i| = 1.5 \end{cases} \tag{10}$$

4.1 Modern Societies

The modern society scenario applies the baseline calibration in which children inherit preferences from parents with probability $p = 0.5$, income mobility is high ($\gamma = 0.25$), and the cost of child-rearing is 20 percent of life-time income for each children. These values capture key features of modern economies: weaker intergenerational cultural persistence, high exposure to diverse social influences, and substantial time and financial costs associated with raising children. A mobility parameter of $\gamma = 0.25$ implies that children have equal probability of entering any income quartile, independent of their parents' status. The first 5 rows in Table 4 reports the numerical results for each calibration.

Under these conditions, the model converges to a steady state with a fertility rate of 0.8703, which is below replacement threshold of one child per monoparental adult. The resulting distribution of preferences reflects the balance between fertility-driven expansion of high-preference groups and the dampening effect of income shocks and oblique transmission. While high-preference types reproduce at higher rates, persistent exposure to intergenerational



(a) $p = 0.2$ (b) $p = 0.5$ (c) $p = 0.7$

Figure 7: Preference Distribution By Different Level of Vertical Transmission in Modern Society

mobility shock and cultural diffusion prevents any one group from fully dominating the population.

Figures 7 through 9 summarize how the long-run preference distribution and fertility outcomes respond to changes in key parameters around this benchmark. Notably, fertility rises with stronger vertical transmission and weaker mobility, but remains bounded due to ongoing shocks and the assumed ceiling in preference levels. For most parameter values the fertility rate remains below the replacement rate. In settings with extremely low mobility, however, fertility exceeds replacement, implying the potential for long-run population expansion. These findings help explain cross-country and within-country variation in fertility. Societies whose cultures place a stronger emphasis on family, or whose economic structures offer limited upward mobility, tend to sustain higher birth rates, whereas more mobile or individual-oriented societies are more likely to experience persistent low fertility.

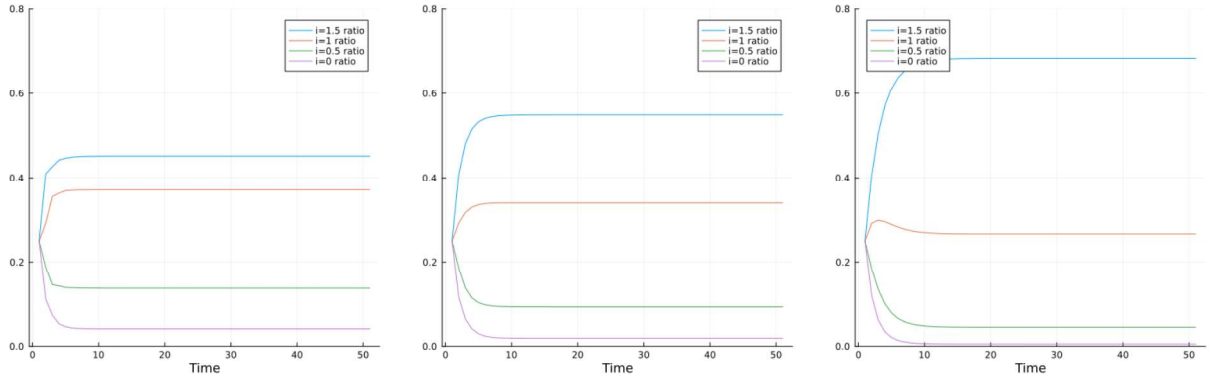
Panel (c) of Figure 9 confirms that, despite differing initial conditions, all scenarios converge to the same steady-state fertility rate due to identical structural parameters. However, societies that begin with a higher share of low- (or high-) preference groups exhibit correspondingly lower (or higher) fertility rates in the early periods. If a society experiences a temporary shock that alters fertility preferences—such as a popular media campaign promoting large size family or a trend on TikTok encouraging non-marriage and non-childbearing—it may lead to short run fluctuations in fertility. Nonetheless, in the long run, fertility rates converge to levels determined by the vertical transmission rate and the degree of intergenerational income mobility.[2]

4.2 Traditional Societies

In this study, the traditional society is characterized by limited social exposure and low income mobility. The probability of vertical cultural transmission is set at 0.8, and children remain in their parents' income quartile with the same likelihood of 0.8. Historical conditions also imply lower child-rearing costs relative to the modern benchmark.

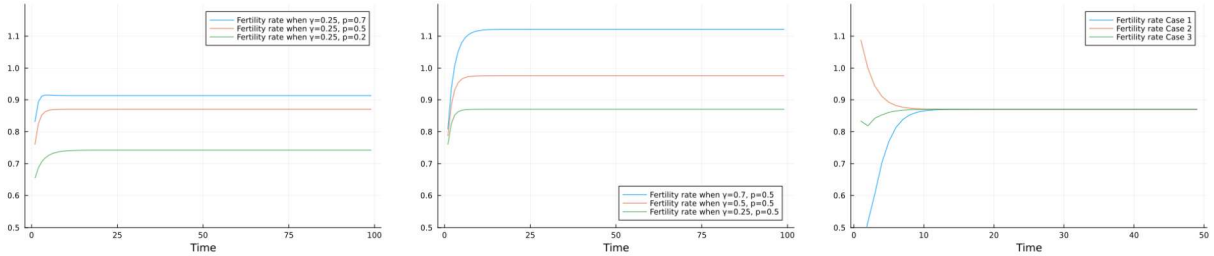
Under this calibration, the traditional society converges to a steady-state fertility rate of 1.3156. This outcome

[2]The plot showing the distribution of preference over time for each initial condition is provided in Appendix.



(a) $\gamma = 0.25$ (b) $\gamma = 0.5$ (c) $\gamma = 0.7$

Figure 8: Preference Distribution By Different Level of Intergenerational Income Mobility in Modern Society



(a) Fertility Rate by Different Level of Vertical Transmission

(b) Fertility Rate by Different Level of Intergenerational Mobility

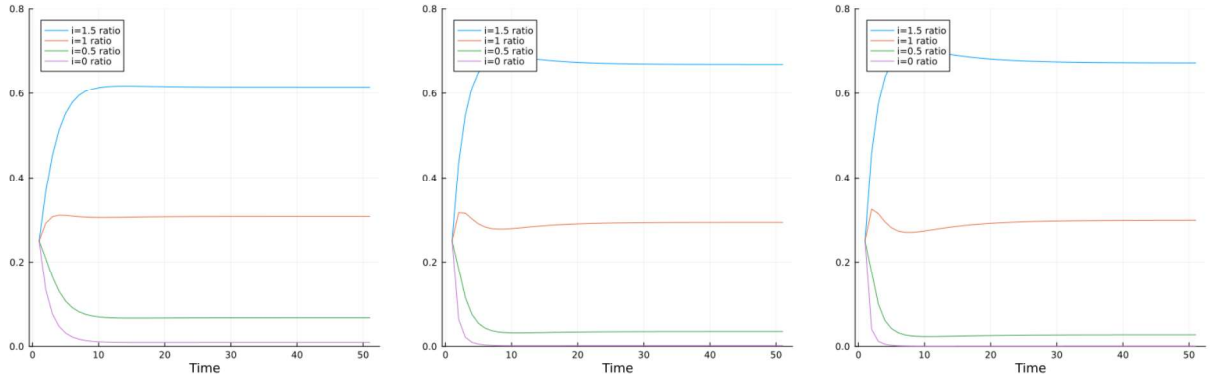
(c) Fertility Rate by Different Scenario of Initial Distribution

Figure 9: Fertility Rate by Different Level of Parameters in Modern Society

demonstrates that even in the presence of income mobility shocks, the fertility rate can far exceed the replacement level. Compared to the patterns observed in Figures 7 and 8 for the modern setting, Figures 10 and 11 reveal a visibly larger share of high-preference individuals. The effects of parameters are consistent with those identified earlier: higher values of vertical transmission p and lower mobility both reduce the forces that limit the expansion of high-preference groups. Unless one parameter is sufficiently offset by a strong counteracting value of the other, fertility remains above replacement level, producing a Malthusian scenario of exponential population growth.

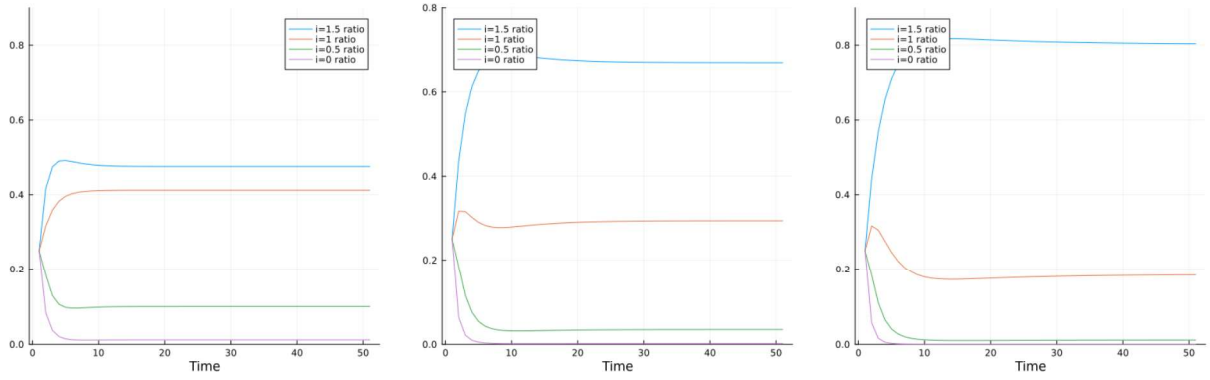
This mechanism mirrors demographic trends observed in the West following the Industrial Revolution or the World War II. During this period, population growth surged due to substantial advancements in medical and agricultural technologies, which enabled individuals to pursue optimization strategies similar to those in modern settings. However, cultural norms remained largely traditional. Family-centered values continued to shape behavior, and it was not uncommon for children to inherit not only their parents' education levels but also their occupations.

Similarly, in Asia, contemporary low-fertility societies such as South Korea once experienced remarkably high fertility. For example, in the post–Korean War era, the total fertility rate in Korea exceeded six children per woman as shown in Figure 1. Considering that Korea's modernization only began in the late 19th century and was disrupted by colonization and war, the societal structure of the 1960s retained deeply traditional values. The subsequent decline



(a) $p = 0.5$ (b) $p = 0.8$ (c) $p = 0.9$

Figure 10: Preference Distribution By Different Level of Vertical Transmission in Traditional Society



(a) $\gamma = 0.5$ (b) $\gamma = 0.8$ (c) $\gamma = 0.9$

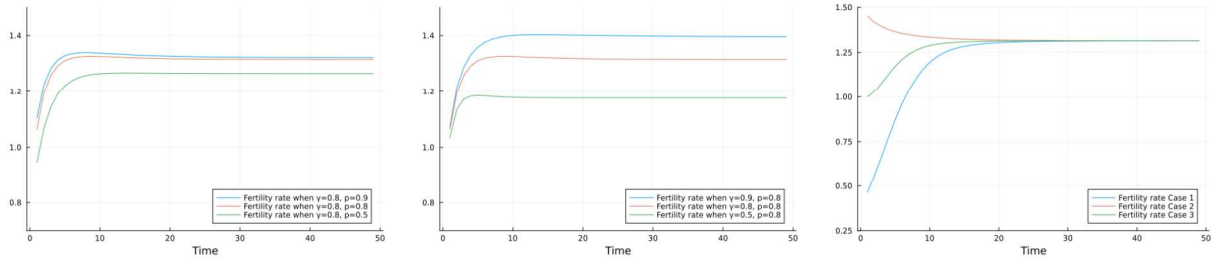
Figure 11: Preference Distribution By Different Level of Intergenerational Income Mobility in Traditional Society

in fertility may have been a response to rapid structural shifts induced by nationwide family-planning campaigns and accelerated modernization.

Even today, countries that retain more traditional social structures often exhibit higher fertility rates than modern societies. In contexts where family ties remain strong, and intergenerational expectations persist—such as the cultural norm that children will provide support in old age—fertility behavior may remain elevated. In such societies, the high share of wealth transferred through inheritance also functions as a form of reduced intergenerational economic mobility. These features suggest that persistent traditional norms, both cultural and institutional, continue to shape fertility outcomes in meaningful ways.

5 Counterfactual Analysis: The Role of Intergenerational Mobility

Previous sections demonstrated that intergenerational mobility is critical for shaping long-run fertility patterns. To further illustrate this point, we conduct a counterfactual analysis by simulating the modern society scenario without the



(a) Fertility Rate by Different Level of Vertical Transmission

(b) Fertility Rate by Different Level of Intergenerational Mobility

(c) Fertility Rate by Different Scenario of Initial Distribution

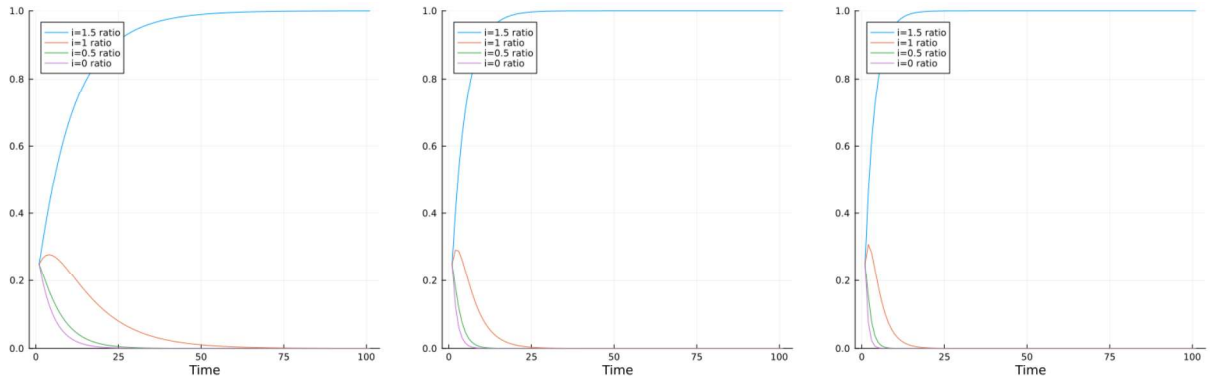
Figure 12: Fertility Rate by Different Level of Parameters in Traditional Society

mobility-induced preference shock. In this setting, preference formation occurs only through the first stage—vertical or oblique cultural transmission—and children do not adjust their fertility ideals in response to intergenerational income differences. Nonetheless, substitution effects arising from income can still lead to fertility choices that deviate from stated preferences.

All parameters are identical to those in the modern benchmark. The probability of vertical transmission is set to $p = 0.5$, income mobility is high with $\gamma = 0.25$, and the cost of childbearing is 20 percent of lifetime income per child.

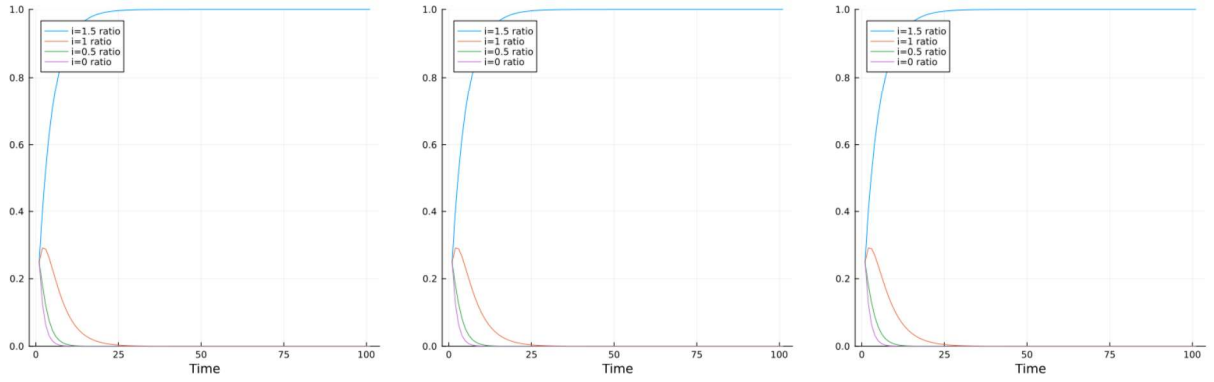
Figure 13 and 14 illustrate the evolution of preference distribution under varying levels of vertical transmission and income mobility, respectively. The results highlight several important differences. First, the directional effects of vertical transmission and income mobility remain unchanged. Higher vertical transmission or lower mobility continues to increase fertility. Second, in the absence of mobility shocks, the high-preference group eventually dominates the population, while the low-preference group disappears. Without the countervailing force of preference downgrades, the evolutionary advantage of high-fertility types is unchecked. As a result, fertility rates are consistently higher than in the benchmark with mobility shocks, exceeding the replacement level at 1.25 compared to 0.87 in the benchmark. Panel (a) and (b) in Figure 15 illustrates this pattern, where dashed lines represent the benchmark with mobility shocks and solid lines represent the counterfactual without them. This comparison demonstrates that intergenerational mobility shocks to preferences not only reduce long-run fertility but also play a central role in preserving cultural heterogeneity within the population.

In the counterfactual scenario without mobility-induced preference shocks, initial conditions play a decisive role in shaping long-run outcomes. As shown in Panel (c) of Figure 15, when the population begins with a high share of low-preference types (case 1), the evolutionary advantage of high-fertility groups is insufficient to drive their expansion, resulting in a persistent low-fertility equilibrium. The steady-state fertility rate in case 1 is 0.25, substantially lower than in the benchmark model with mobility shocks, where the rate is 0.87. Conversely, if high-preference types dominate initially, they can eventually take over the entire population. This sensitivity to initial conditions stands in sharp contrast to the benchmark model with mobility shocks to preferences, where structural parameters alone deter-



(a) $p = 0.2$ (b) $p = 0.5$ (c) $p = 0.7$

Figure 13: Preference Distribution By Different Level of Vertical Transmission without Intergenerational Income Mobility-induced Preference Shocks



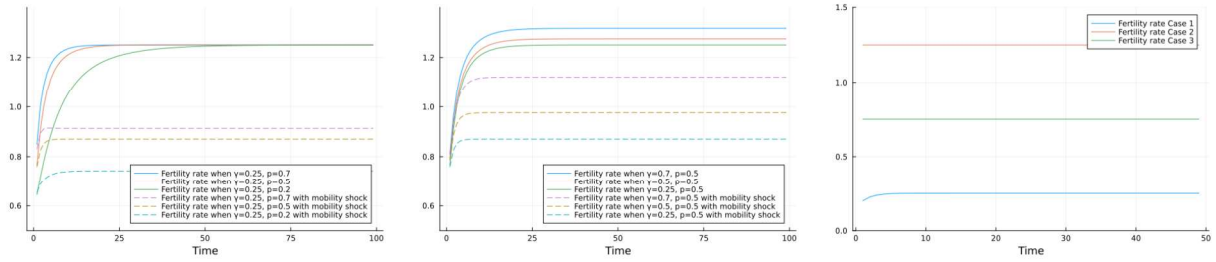
(a) $\gamma = 0.25$ (b) $\gamma = 0.5$ (c) $\gamma = 0.7$

Figure 14: Preference Distribution By Different Level of Intergenerational Income Mobility without Intergenerational Income Mobility-induced Preference Shocks

mine long-run outcomes regardless of the initial distribution. Intergenerational mobility-induced preference shocks therefore not only curb the unchecked dominance of high-fertility groups but also induce upward preference shifts among children of low-preference parents, thereby sustaining cultural diversity over time.

6 Discussion and Conclusions

This paper develops a dynamic overlapping-generations framework that integrates cultural transmission with intergenerational income mobility to explain persistent heterogeneity in fertility preferences and the sustained decline in fertility rates observed in many modern societies. In contrast to standard models that assume homogeneous and exogenous fertility ideals, the framework highlights how preferences themselves evolve in response to both socialization and economic dynamics. The key innovation lies in introducing a second stage of preference formation in which



(a) Fertility Rate by Different Level of Vertical Transmission

(b) Fertility Rate by Different Level of Intergenerational Mobility

(c) Fertility Rate by Different Scenario of Initial Distribution

Figure 15: Fertility Rate by Different Level of Parameters without Intergenerational Income Mobility-induced Preference Shocks

children revise their fertility ideals after comparing their own income prospects to those of their parents. This mechanism allows intergenerational mobility shocks to directly alter preferences, thereby counteracting the evolutionary advantage of high-fertility groups.

The analysis yields three main findings. First, with intergenerational mobility shock, cultural heterogeneity in fertility preferences can persist, even though evolutionary force would predict the dominance of high-fertility types. Mobility-induced shocks prevent complete homogenization and sustain preference diversity. Second, higher intergenerational mobility reduces long-run fertility by increasing the likelihood that children of high-fertility parents adopt lower fertility ideals due to downward preference shock. Third, weaker vertical cultural transmission accelerates fertility decline, as children are more likely to adopt preferences from the broader social environment rather than from their parents. Together, these results provide a unified explanation of how the interaction between cultural transmission and intergenerational mobility, combined with rising direct and indirect costs of childrearing, has led many societies to converge toward lower fertility rates.

This framework relies not only on the assumption that individuals hold heterogeneous fertility preferences, but also that they adjust these preferences in response to differences in socioeconomic status (SES) relative to their parents. Within the presented model, this intergenerational preference adjustment mechanism plays a central role in generating the observed decline in fertility. However, because socioeconomic status also affects the budget constraint, it is challenging to disentangle whether low fertility outcomes reflect changes in underlying preferences or shifts in economic conditions. Although preference formation is inherently difficult to measure, the increasing availability of large-scale cross-country survey data offers promising opportunities for future empirical validation. Further work may also explore alternative mechanisms capable of producing similar dynamics without relying on explicit SES-based preference updating.

Several extensions remain for future research. One promising direction is to introduce endogenous income mobility or alternative Markov processes for income transitions, allowing the model to better capture institutional variation across societies. Another useful extension would permit interaction between intergenerational mobility and cultural

transmission. Greater mobility may weaken family influence and thus vertical transmission, whereas limited mobility may strengthen both. Enriching the preference formation stage or broadening the definition of types is another potential avenue, as recent work such as Kearney and Levine (2025) highlights the role of shifting priorities and evolving social norms. Relaxing the assumption that childbearing costs are linearly proportional to income, by allowing for market substitutes such as childcare services, would reduce the income elasticity of fertility costs. Incorporating parental altruism or investments in child quality would also align the framework more closely with human-capital–based fertility models and open additional channels through which income dynamics affect fertility. Finally, empirical work linking lifestyle heterogeneity, income trajectories, and fertility preferences would enable direct testing of the model's key predictions.

References

Akerlof, G. A. and R. E. Kranton (2005). Identity and the economics of organizations. *Journal of Economic perspectives 19*(1), 9–32.

Alesina, A., P. Giuliano, and N. Nunn (2013). On the origins of gender roles: Women and the plough. *The quarterly journal of economics 128*(2), 469–530.

Altonji, J. G., F. Hayashi, and L. J. Kotlikoff (1997). Parental altruism and inter vivos transfers: Theory and evidence. *Journal of political economy 105*(6), 1121–1166.

Barro, R. J. and G. S. Becker (1989). Fertility choice in a model of economic growth. *Econometrica: journal of the Econometric Society*, 481–501.

Becker, G. S. (1960). An economic analysis of fertility. In *Demographic and economic change in developed countries*, pp. 209–240. Columbia University Press.

Becker, G. S. and H. G. Lewis (1973). On the interaction between the quantity and quality of children. *Journal of political Economy 81*(2, Part 2), S279–S288.

Bisin, A. and T. Verdier (2001). The economics of cultural transmission and the dynamics of preferences. *Journal of Economic theory 97*(2), 298–319.

Boyd, R. and P. J. Richerson (1985). *Culture and the evolutionary process*. University of Chicago press.

Cavalli-Sforza, L. L. and M. W. Feldman (1981). *Cultural transmission and evolution: A quantitative approach*. Number 16. Princeton University Press.

Chu, C. C. and H.-W. Koo (1990). Intergenerational income-group mobility and differential fertility. *The American Economic Review*, 1125–1138.

De La Croix, D. and M. Doepke (2003). Inequality and growth: why differential fertility matters. *American Economic Review 93*(4), 1091–1113.

Easterlin, R. A. (1987). *Birth and fortune: The impact of numbers on personal welfare*. University of Chicago Press.

Farré, L. and F. Vella (2013). The intergenerational transmission of gender role attitudes and its implications for female labour force participation. *Economica 80*(318), 219–247.

Galor, O. and D. N. Weil (1993). The gender gap, fertility, and growth.

Gobbi, P. E. (2013). A model of voluntary childlessness. *Journal of Population Economics 26*(3), 963–982.

Goldin, C. and L. F. Katz (2000). Career and marriage in the age of the pill. *American Economic Review 90*(2), 461–465.

Hakim, C. (2003). A new approach to explaining fertility patterns: Preference theory. *Population and development review 29*(3), 349–374.

Kearney, M. S. and P. B. Levine (2025). Why is fertility so low in high income countries? Technical report, National Bureau of Economic Research.

Lawson, D. W. and R. Mace (2011). Parental investment and the optimization of human family size. *Philosophical Transactions of the Royal Society B: Biological Sciences 366*(1563), 333–343.

Malthus, T. R. (1967). *Essay on Principle of Population 1798*. Readex Microprint.

Mitrea, E. C., M. Mühlböck, and J. Warmuth (2021). Extreme pessimists? expected socioeconomic downward mobility and the political attitudes of young adults. *Political Behavior 43*(2), 785–811.

Murphy, M. and L. B. Knudsen (2002). The intergenerational transmission of fertility in contemporary denmark: The effects of number of siblings (full and half), birth order, and whether male or female. *Population studies 56*(3), 235–248.

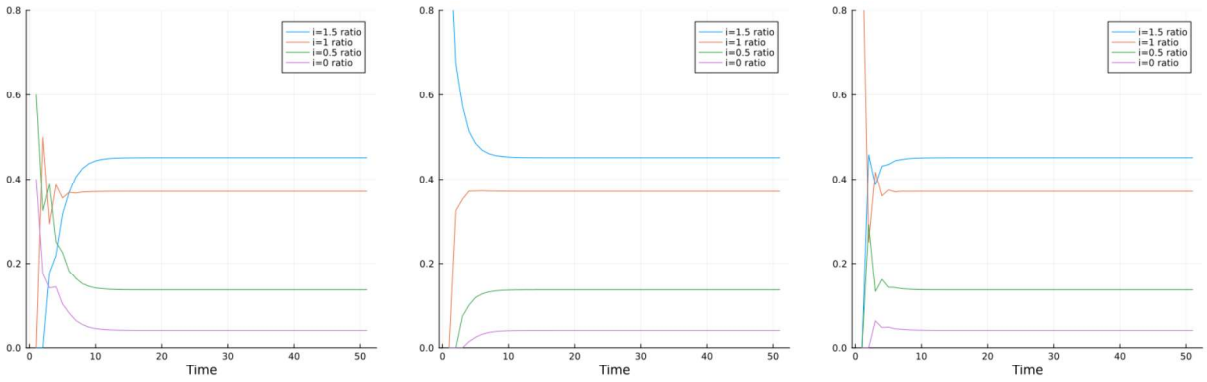
Oliveira, Í. M., E. J. Porfeli, M. do Céu Taveira, and B. Lee (2020). Children's career expectations and parents' jobs: intergenerational (dis) continuities. *The Career Development Quarterly 68*(1), 63–77.

Porter, C. and D. Serra (2020). Gender differences in the choice of major: The importance of female role models. *American Economic Journal: Applied Economics 12*(3), 226–254.

Trinitapoli, J. and S. Yeatman (2017). The flexibility of fertility preferences in a context of uncertainty. *Population and Development Review 44*(1), 87.

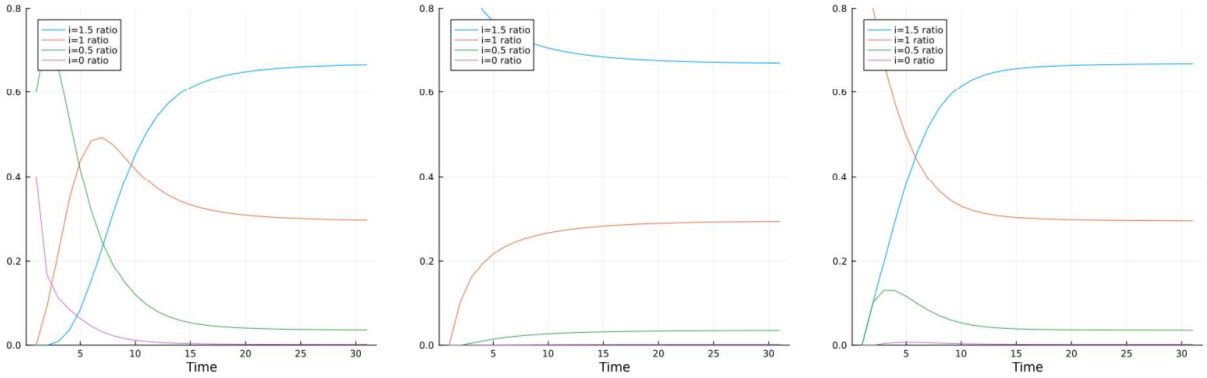
Appendix

A.1 Preference Distribution with Skewed Initial Distribution



(a) Case 1 (b) Case 2 (c) Case 3

Figure 16: Preference Distribution By Different Initial Distribution Scenarios in Modern Society



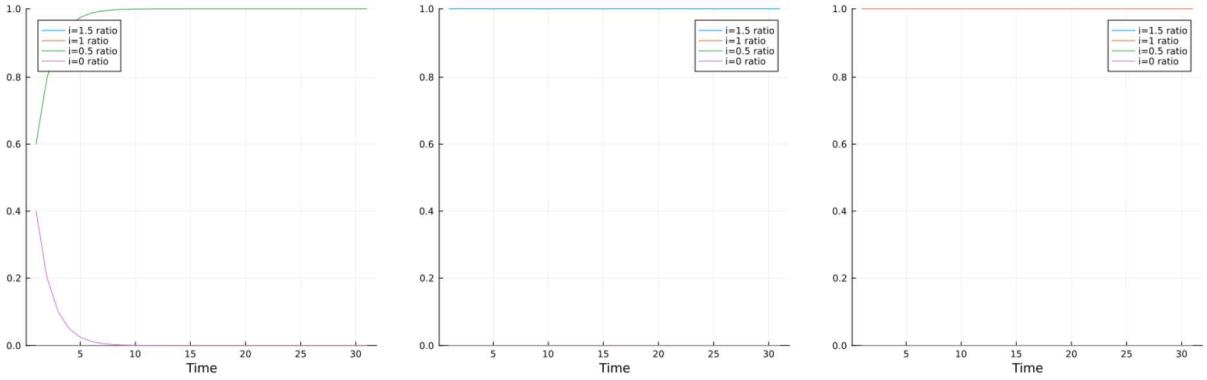
(a) Fertility Rate by Different Level of Vertical Transmission

(b) Fertility Rate by Different Level of Intergenerational Mobility

(c) Fertility Rate by Different Scenario of Initial Distribution

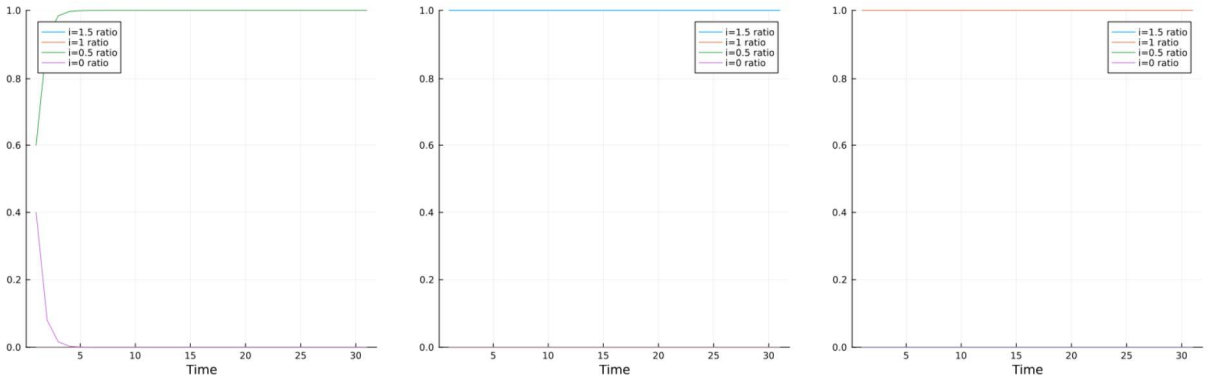
Figure 17: Preference Distribution By Different Initial Distribution Scenarios in Traditional Society

A.2 Preference Distribution in Counterfactual Model with Skewed Initial Distribution



(a) Case 1 (b) Case 2 (c) Case 3

Figure 18: Preference Distribution By Different Initial Distribution Scenarios in Counterfactual Modern Society



(a) Case 1 (b) Case 2 (c) Case 3

Figure 19: Preference Distribution By Different Initial Distribution Scenarios in Counterfactual Traditional Society