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Abstract

Rising childlessness is now a central margin of very low fertility in middle- and high-income countries, where delayed entry into parenthood increasingly risks becoming permanent non-parenthood. Because completed cohort childlessness can only be observed at the end of reproductive life, this chapter develops a period measure of childlessness, analogous to the Total Fertility Rate, that summarizes the age-specific first-birth conditions prevailing in a given year. Applied to the countries for which the measure can be computed, period childlessness has risen everywhere, reaching around one quarter in several Western countries, more than one third in Finland, Japan, and Spain, and 45% in South Korea. To interpret these patterns, the chapter proposes a conceptual framework that moves beyond the conventional distinction between voluntary and involuntary childlessness, distinguishing instead between biological, poverty-driven, opportunity-driven, marriage-market, and mortality-driven routes to non-parenthood. The rise in childlessness is then interpreted through a model in which partnership formation and fertility are jointly determined. We map leading explanations for rising childlessness into this unified framework, showing how declining partnership surplus, housing costs, gendered child-rearing norms, weaker pro-natalist preferences, and uncertainty affect childlessness through model primitives.

Keywords: Childlessness, Fertility decline, Period childlessness rate, Union formation, Opportunity-driven childlessness, Poverty-driven childlessness, Gender norms, Housing costs, Economic uncertainty, Demographic contraction

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The prospect of global demographic contraction has moved from a distant theoretical possibility to a central contemporary challenge. Recent projections suggest that world population is likely to peak during the present century, reflecting both faster fertility decline in some high-fertility regions and unexpectedly low fertility in many large middle- and high-income countries (United Nations Department of Economic and Social Affairs, Population Division 2024; Bhattacharjee, Schumacher, Aali, et al. 2024). Sub-Saharan Africa remains a major exception in level terms: fertility there is still well above replacement, and population growth is expected to continue for decades; nevertheless, the speed of fertility decline in the region is important not only for the timing and height of the global population peak (United Nations Department of Economic and Social Affairs, Population Division 2024), but mostly for the potential demographic dividend within the region. In the developed world, by contrast, the question is no longer whether fertility will fall below replacement, but how far below replacement it can remain and how can economies adapt to shrinking populations (OECD 2024; Bloom, Kuhn, and Prettner 2024).

A key margin of the demographic change is the childlessness rate. Very low fertility is not only driven by parents having fewer second or third births; it also reflects a growing share of individuals who never enter parenthood at all. While economists and demographers have extensively studied fertility, childlessness as a distinct demographic outcome has received much less attention (Doepke et al. 2023).[1]

In other words, scholarly literature has been concentrated on the intensive margin of fertility, the children born from mothers, rather than on the extensive margin of fertility, the probability to transit from the status of non-parent, to the one of parent. Recently, the role of the *extensive* margin in fertility decisions has attracted more attention as union formation, stable employment, housing access, and the transition to a first birth are postponed into later ages, leaving less time to reproduce and making temporary postponement more likely to become permanent childlessness (Beaujouan 2023; Beaujouan and Neels 2025). In addition,

1. Historical evidence suggests that the extensive margin of fertility has long been an important component of demographic change. For England, Croix, Schneider, and Weisdorf (2019) argue that accounting for celibacy and childlessness substantially alters conclusions about reproductive success across social classes during the Industrial Revolution. At the top of the social hierarchy, Gobbi and Goñi (2021) show that inheritance institutions affected childlessness among British aristocrats, with marriage settlements reducing childlessness and contributing to the survival of noble dynasties. Together, these studies highlight that childlessness has historically also responded to economic incentives, social institutions, and marriage-market conditions, making it an important margin through which demographic change operates.

childlessness may therefore be not only one component of low fertility, but a revealing indicator of the social and economic conditions under which parenthood is delayed or foregone. Understanding its rise is essential for explaining the persistence of very low fertility and for assessing its economic consequences (OECD 2024; Bloom, Kuhn, and Prettner 2024).

Measuring childlessness, however, is less straightforward than measuring fertility. The most used indicator is cohort childlessness: the share of women who never had a child at the end of their reproductive lives. By construction, however, this measure can only be observed for cohorts born several decades earlier. For example, Sobotka (2017) report that among women born in 1968, childlessness reached 14% in France, 20% in Italy, 14% in Sweden, and 8% in Russia. While such figures provide valuable information on completed reproductive outcomes, they say little about whether childlessness is rising among younger cohorts whose reproductive lives are still unfolding. To capture more recent developments, this chapter introduces a Total Childlessness Rate (TCR), a period measure inspired by the logic of the Total Fertility Rate. Following the approach of Shaw (2025), the TCR is defined as the probability that a woman would remain childless throughout her reproductive life if, at each age, she were exposed to the age-specific conditional probabilities of not having a first birth observed in a given year.

Applying this measure to a selection of countries reveals a clear and widespread increase in period childlessness. Completed childlessness among women born around 1968 ranged from 8% in Chile and Russia to 26% in Japan, with most European and North American countries lying between 12% and 20% (Sobotka 2017, 2021). Our period estimates, based mainly on parity-specific data from the Human Fertility Database, show that current conditions of entry into parenthood imply substantially higher levels of childlessness (Human Fertility Database 2026, 2024; National Center for Health Statistics 2024). In all countries considered, the latest period childlessness rate is above the completed childlessness of the 1968 cohort. The increase is especially large in South Korea, where the period measure reaches 45%, and in Japan, Finland, and Spain, where it exceeds one third. Even in countries where completed childlessness had long appeared moderate, such as Belgium, Denmark, Sweden, and the United States, the latest period measure is close to one quarter. These results suggest that the recent decline in fertility is not only a matter of smaller families among parents, but also reflects a marked weakening of the transition into parenthood itself.

A natural question is whether the rise in childlessness reflects changes in fertility behaviour among couples or, more fundamentally, changes in the process

of couple formation itself. In most low-fertility societies, parenthood continues to occur predominantly within stable unions, making partnership formation a key prerequisite for entry into parenthood. Delayed union formation, lower partnership rates, and greater relationship instability therefore reduce the time available for childbearing and increase the likelihood that postponement becomes permanent childlessness. Understanding the rise in childlessness thus requires understanding the evolution of partnership alongside fertility behaviour.

To understand better how childlessness and partnership formation (marriage or cohabitation) are related, we rely on a simplified theoretical framework building on Baudin, de la Croix, and Gobbi (2015) and Baudin, de la Croix, and Gobbi (2020). The model treats marriage and fertility as two connected decisions. Individuals first meet on the marriage market and marry only if both partners prefer the match to remaining single; they then choose consumption and fertility. This structure allows us to distinguish several channels through which marriage affects childlessness. Marrying creates economies of scale by allowing partners to share both fixed household costs and domestic time; it can also help poor women to reach a minimum economic condition required for childbearing. At the other end of the distribution, marriage can reduce the opportunity cost of motherhood when men participate to child-rearing. Conversely, childlessness may rise when children are less valued, when housing or household maintenance costs are high, when women bear most child-rearing costs, or when the non-material surplus from marriage (love) is weak. The framework therefore provides a way to interpret the joint evolution of coupling and childlessness: a fall in partnership and a rise in childlessness are not independent phenomena, but can reflect common changes in the economic and non-economic returns to forming a household and having children.

We use this framework to organize and interpret the recent literature on the rise in childlessness. Rather than treating childlessness as the outcome of a single force, we map the main proposed explanations into the primitives of the model. First, we discuss the role played by the decline in the surplus from couple formation, emphasized in explanations based on digital entertainment and the rise of singlehood. Second, the way housing costs can affect both marriage decisions and childlessness. Third, the role of mismatched gender norms and the share of child-rearing time borne by women relative to men. Fourth, we discuss how weaker pro-natalist norms can make zero children less costly in utility terms. Finally, although uncertainty about the future does not directly map into our model, we discuss how it encourages postponement and may turn into permanent childlessness when biological or partnership constraints bind. This mapping clarifies

that the rise in childlessness can reflect several distinct mechanisms, some acting through the marriage market, others through the cost and preferences of children, and others through delayed realization of fertility plans.

1 Measuring Period Childlessness

Childlessness is commonly measured as the share of a birth cohort that has had no children by the end of reproductive life. This cohort measure has the advantage of being directly interpretable: it corresponds to the realised proportion of women who never became mothers. Its drawback is that it can only be observed with a long delay. For example, Sobotka (2017) report completed childlessness for women born in 1968. These figures are valuable benchmarks, but they cannot reveal whether childlessness is increasing among women born later, whose fertility histories are still incomplete.

To obtain a more contemporaneous indicator, we construct a period measure analogous to the Total Fertility Rate (TFR). The TFR summarises the fertility conditions prevailing in year t by asking how many children a woman would have over her reproductive life if she experienced the age-specific fertility rates observed in that year. We apply the same logic to entry into parenthood. The resulting measure asks whether a woman would remain childless if, throughout her reproductive life, she experienced the age-specific first-birth conditions prevailing in a given calendar year.

Let $q_1(x,t)$ denote the conditional probability that a childless woman of exact age x has a first birth between ages x and $x+1$ in year t. Equivalently, $1-q_1(x,t)$ is the conditional probability that a childless woman of age x does not have a first birth during that interval. We define the Total Childlessness Rate as follows.

Definition 1 (Total Childlessness Rate)**.** *The* Total Childlessness Rate *(TCR) measures the probability that a woman would remain childless by the end of reproductive life if she were exposed throughout her life to the age-specific first-birth probabilities prevailing in a given year t.*

In formal terms, fix a calendar year t. We consider a *synthetic cohort* of women who, at each age, are exposed to the period first-birth schedule observed in that year. Ages are discrete and annual: $x = x_0, x_0+1, \ldots, X$, where x_0 is the start age and X the terminal exact age. Let $\ell_0(x,t)$ be the proportion of this synthetic

cohort who are still childless at exact age x. We initialise the cohort at x_0 as

$$\ell_0(x_0, t) = 1. \tag{1}$$

By definition, the fraction childless at age $x + 1$ equals the fraction childless at age x times the probability of *no first birth* during $[x, x + 1)$:

$$\ell_0(x + 1, t) = \ell_0(x, t)\big(1 - q_1(x, t)\big). \tag{2}$$

Iterating from x_0 to X yields

$$\ell_0(X, t) = \prod_{u=x_0}^{X-1} \big(1 - q_1(u, t)\big). \tag{3}$$

The **Total Childlessness Rate** in year t is therefore the synthetic probability of remaining childless by terminal age:

$$\mathrm{TCR}(t) = \Pr(B = 0) = \ell_0(X, t) = \prod_{u=x_0}^{X-1} \big(1 - q_1(u, t)\big), \tag{4}$$

where B denotes the total number of births a woman has by terminal age X in the synthetic cohort. Intuitively, $\mathrm{TCR}(t)$ multiplies the year-t age-specific probabilities of *not* having a first child, conditional on still being childless.

This measure should not be interpreted as a forecast for any actual cohort. Like the TFR, it is affected by the timing of fertility. A postponement of first births, for instance, may mechanically increase the period TCR even if the completed childlessness of the corresponding birth cohorts eventually changes less. The TCR should therefore be read as a period indicator of the current intensity of entry into parenthood.

The same synthetic-cohort logic can also be extended to the full parity distribution. For each age x and each parity transition from $k - 1$ births to k births, define

$$q_k(x, t) \in [0, 1], \qquad k = 1, 2, \ldots, K, \tag{5}$$

where $q_k(x, t)$ is the conditional probability that a woman who is at parity $k - 1$ at exact age x has her k-th birth between ages x and $x + 1$. Let $\ell_j(x, t)$ be the proportion of the synthetic cohort who are at parity j at exact age x, for

$j = 0, 1, 2, \ldots, K$. We initialise the cohort at x_0 as

$$\ell_0(x_0, t) = 1, \qquad \ell_j(x_0, t) = 0 \quad \text{for } j \geq 1. \tag{6}$$

Without loss of generality, we assume that within each one-year interval $[x, x+1)$ at most one parity progression occurs. The TCR is the first element of this broader synthetic parity distribution: it is the probability of ending reproductive life at parity zero. Similarly, one can compute the synthetic probability of ending reproductive life with at least one child as

$$\Pr(B \geq 1) = 1 - \mathrm{TCR}(t), \tag{7}$$

and, using the full sequence of parity-transition probabilities, the probability of ending reproductive life with at least two children, at least three children, and so on.

We now apply the formula to data from Human Fertility Database (2026). We compute the period TCR from the HFD period fertility tables and compare it with completed cohort childlessness. In the theoretical exposition above, $\ell_0(X, t)$ denotes the proportion of the synthetic cohort remaining childless at terminal age X. In the HFD period fertility tables, the corresponding object is reported as a table population, denoted $l_0(X, t)$, rather than directly as a proportion. It must therefore be divided by the table radix. The radix, denoted R, is the initial size of the synthetic cohort used to construct the fertility table; equivalently, it is the number of women at parity zero at the starting age x_0:

$$R = l_0(x_0, t). \tag{8}$$

In the HFD tables used here, this radix is normalised to 10,000. The period TCR is therefore computed as

$$\mathrm{TCR}(t) = \frac{l_0(X, t)}{R}. \tag{9}$$

This implementation is equivalent to the product formula derived above, since the HFD period fertility table already incorporates the sequence of age-specific first-birth probabilities into the synthetic parity distribution.

Table 1 compares completed cohort childlessness among women born in 1968 with our period measure of childlessness in 2010 and in the most recent year available. The year 2010 provides a natural benchmark for comparison, as women born in 1968 had largely completed their fertility histories. The contrast is striking. In

Country	Cohort Childlessness		Period Childlessness [3]			
	Rate	Year	Rate	Year	Rate	Year
Belgium	16%	1968 [1]	19%	2010	24%	2022
Chile	8%	1968 [4]	9%	2010	13%	2020
Denmark	12%	1968 [1]	14%	2010	23%	2024
Finland	20%	1968 [1]	21%	2010	36%	2024
Japan	26%	1968 [2]	30%	2010	37%	2023
Portugal	12%	1968 [1]	13%	2010	15%	2023
Russia	8%	1968 [1]	15%	2010	20%	2018
South Korea	10%	1968 [2]	25%	2010	45%	2023
Spain	16%	1968 [1]	24%	2010	34%	2023
Sweden	14%	1968 [1]	12%	2010	25%	2024
USA	13%	1968 [5]	14%	2010	24%	2023

Sources: [1] Sobotka (2017), [2] Sobotka (2021), [3] authors' computation using Human Fertility Database (2026), [4] authors' computation using Human Fertility Database (2024), [5] authors' computation using National Center for Health Statistics (2024).

Table 1: Childlessness rate in a selection of countries

most countries, the period measure already exceeded the completed childlessness of the 1968 cohort in 2010, suggesting that the conditions governing entry into parenthood had become less favorable than those experienced by women who had already completed their reproductive lives. Since then, childlessness has increased further in every country in the table, although at very different rates.

The increase is relatively modest in Portugal and Chile, more substantial in Belgium, Denmark, Russia, Sweden, and the United States, and particularly pronounced in Finland, Spain, Japan, and especially South Korea, a country that also exhibits one of the lowest fertility rates in the world. By the latest available year, period childlessness reaches around one quarter in Belgium, Denmark, Sweden, and the United States, about one third in Finland, Japan, and Spain, and as high as 45% in South Korea.

These figures should not be interpreted as forecasts of the completed childlessness of current cohorts, since period measures are sensitive to the timing of first births. They nevertheless provide a useful summary of the contemporary environment for family formation. Under the age-specific first-birth rates observed in

recent years, the likelihood of remaining childless has risen sharply across a wide range of countries. Childlessness is therefore not a peripheral aspect of today's low-fertility regimes, but one of their defining features.

The period childlessness rates reported in Table 1 document a weakening of entry into parenthood, but they do not reveal the proximate demographic mechanisms underlying this trend. A natural candidate is partnership formation. In most of the countries considered here, first births continue to occur predominantly within stable unions, making couple formation a prerequisite for parenthood for a large share of the population. Delayed union formation therefore shortens the time available for childbearing and increases the risk of remaining childless. To investigate this channel, we complement our period childlessness estimates with a simple indicator of coupling: the share of women aged 25–39 who are married or living in a union. This age range encompasses the core years for having a first birth and allows us to assess whether rising childlessness has been accompanied by a decline in partnership formation.

The data shown in Table 2 are constructed by compiling nationally representative information on marital and union status, mainly from censuses and household surveys, and harmonizing these observations by country, calendar year, sex, and five-year age group.

Table 2 reveals a widespread decline in the share of women aged 25–39 who are married or in a union. The fall is visible in every country in the sample, although the magnitude of the change varies considerably. Between 1970 and 2020, the decline exceeds 25 percentage points in South Korea, Japan, Portugal, and Belgium, and approaches 20 percentage points in Denmark, Spain, and the United States. Even in countries where the change is more modest, such as Finland, Russia, Sweden, and Chile, the long-run trend remains negative. By 2020, fewer than two thirds of women aged 25–39 were in a union in Belgium, Chile, Japan, Portugal, South Korea, and Spain.

This evolution is particularly relevant because entry into a stable union remains the predominant pathway to parenthood. The rise in period childlessness documented above should therefore not be interpreted solely as a change in fertility behavior among couples. It also reflects changes in the partnership market, including delayed union formation, lower partnership rates, and greater relationship instability. Declining couple formation thus constitutes a natural demographic mechanism linking the postponement of family formation to higher levels of childlessness.

This interpretation is consistent with the evidence of Hayford (2013) for the

	1970	1980	1990	2000	2010	2020
Belgium	91	86	81	76	71	65
Chile	74	69	65	61	56	60
Denmark	88	84	80	77	73	68
Finland	81	79	77	75	72	70
Japan	87	81	75	69	66	60
Portugal	89	89	82	76	69	62
Russia	83	83	83	78	73	69
South Korea	92	85	79	76	69	57
Spain	82	78	74	71	69	61
Sweden	82	80	77	74	71	67
USA	84	80	76	72	68	66

Source: United Nations Department of Economic and Social Affairs, Population Division (2024). Estimates and Projections of Women of Reproductive Age Who Are Married or in a Union 2024.

Table 2: Share of women aged 25–39 married or in a union, 1970–2020

United States. Studying the rise in childlessness during the late twentieth century, she finds that the increase in the proportion of women remaining unmarried by age 40 was the single most important demographic factor behind the growth of childlessness. The cross-country patterns documented here suggest that a similar mechanism may be operating more broadly across low-fertility societies.

2 Types of childlessness

Most of the literature in sociology and demography classifies childlessness using survey-based information. Recently, Neal and Neal (2025) proposed a measurement framework that decomposes childlessness into distinct forms of nonparenthood using the Attitudes–Behavior–Circumstances (ABC) approach and applied it to repeated waves of the U.S. National Survey of Family Growth (NSFG). Their procedure first avoids misclassification by defining parenthood to include individuals with both biological and non-biological children. The remaining nonparents are then classified according to: *(i)* their attitudes toward having children, and *(ii)* the circumstances they face. These circumstances include biological constraints, such as respondent or partner sterility, as well as social constraints. The

latter are inferred when fecund respondents who express a desire for children nevertheless report no intention of becoming parents, a residual category that may reflect barriers such as the absence of a partner or economic constraints. Finally, Neal and Neal (2025) explicitly incorporate partnership status into their framework by documenting the relationship-status composition of each type of non-parent. Distinguishing between partnered and unpartnered individuals allows them to show how coupling intersects with voluntary, biological, and socially constrained pathways to childlessness.

A limitation of survey-based classifications is that fertility intentions are not fixed individual traits. Gemmill (2019) shows that permanently childless women follow heterogeneous trajectories of fertility expectations: some anticipate childlessness relatively early in life, whereas others revise their expectations only later. This finding highlights the need to distinguish observed childlessness from its underlying mechanisms. Rather than viewing childlessness as simply voluntary or involuntary, or as the realization of a stable preference, our typology interprets it as the outcome of a variety of constraints and incentives operating over the life course.[2]

Rather than relying on survey responses, Baudin, de la Croix, and Gobbi (2015) develop a structural model that explicitly distinguishes between the extensive margin of fertility (whether a woman becomes a mother at all) and the intensive margin (the number of children mothers have). In their framework, childlessness emerges endogenously through two distinct mechanisms. The first is a poverty-driven channel, whereby some women remain childless because household resources are insufficient to make childrearing feasible. The second is an opportunity-cost channel, whereby highly educated or high-wage women may choose not to have children because the time cost of childrearing is particularly high. The model is disciplined using several stylized empirical facts, including education gradients in fertility among mothers, the U-shaped relationship between education and childlessness, and observed marriage patterns. The estimated model is then used to quantify the contribution of each mechanism to overall childlessness and to interpret long-run trends, including the U-shaped evolution of childlessness observed as education and productivity rise over time.

Following Baudin, de la Croix, and Gobbi (2015) and Baudin, de la Croix, and Gobbi (2020), we classify childlessness according to its underlying mechanism

2. This caution is consistent with Norling (2022), who shows that fertility intentions are informative but imperfect predictors of subsequent outcomes: intended fertility among childless women often differs from realized fertility.

rather than the observed outcome alone. The same outcome–remaining without children–may arise from five distinct situations.

1. *Biological childlessness.* This form of childlessness results from natural sterility or infecundity. It is exogenous to the economic decision problem and reflects the fact that some individuals or couples are unable to have children even if they desire them.

2. *Poverty-driven childlessness.* This occurs when resources are insufficient to support childbearing while maintaining a minimum required level of consumption. In the model, these are women or couples who would like to have children but whose income is too low once the fixed costs of household formation and childrearing are taken into account. Poverty-driven childlessness is therefore concentrated at the lower end of the income and education distributions.

3. *Opportunity-cost-driven childlessness.* This arises when the time cost of children is high relative to the value of women's time. Women with high levels of education or earnings may choose not to have children because motherhood entails substantial losses in income, career advancement, or personal autonomy. As a result, this form of childlessness is more prevalent at the upper end of the income and education distributions.[3]

4. *Marriage-market childlessness.* When marriage is part of the decision problem, childlessness may also result from the absence of a mutually acceptable match. A woman may remain childless not because she would choose not to have children within marriage, but because no partnership generates sufficient surplus or because potential partners reject the match. In this case, childlessness arises through singlehood.

5. *Mortality-driven childlessness.* Childlessness may also result from child mortality. A woman may give birth but ultimately have no surviving children. High mortality rates, such as those in developing countries, can therefore generate childlessness in terms of surviving offspring.

This typology highlights that childlessness is not a homogeneous outcome. Individuals who remain childless may do so for very different reasons, including

3. This mechanism may weaken when market substitutes for parental time become more available. Hazan, Weiss, and Zoabi (2023) show that highly educated women in the United States are no longer disproportionately childless and interpret this change as reflecting the marketization of child-rearing time.

biological constraints, economic deprivation, high opportunity costs of parenthood, unfavorable marriage-market outcomes, or child mortality. Distinguishing between these mechanisms is essential for understanding both the determinants of childlessness and the potential effects of policy interventions.

The typology also clarifies how the sources of childlessness evolve with economic development. As income and educational attainment rise, poverty-driven childlessness is likely to become less prevalent, while opportunity-cost-driven childlessness may become more important. Likewise, improvements in child survival reduce mortality-driven childlessness, while also affecting fertility decisions through changes in the expected number of surviving children. Interestingly, although economic development generally reduces fertility, it may have a U-shaped relationship with childlessness. At early stages of development, rising incomes reduce poverty-driven childlessness; at later stages, higher female education and earnings increase opportunity-cost-driven childlessness. As a result, the composition of childlessness changes over the development process, potentially generating a U-shaped pattern.

Importantly, this is a latent rather than an observable typology. Researchers do not directly observe why a woman remains childless; instead, the model decomposes childlessness into counterfactual causes. A woman is classified as poverty-driven childless if she would have become a mother under more favorable economic circumstances, and as opportunity-cost-driven childless if she would have had children in an environment where the time or career costs of childrearing were lower. The same observed outcome, no children, can therefore have very different economic interpretations depending on the individual's resources, opportunities, and position in the marriage market.

In their chapter in this volume, Hannusch and Yum (2026) further illustrate the usefulness of this typology. They explicitly frame childlessness as the extensive margin of fertility and, following Baudin, de la Croix, and Gobbi (2015), distinguish between childlessness at the bottom of the education distribution, driven by poverty or "social sterility," and childlessness at the top, driven by the opportunity cost of motherhood. Their discussion of delayed childbearing and the resulting risk of infertility can also be interpreted through this lens. When postponement is a choice motivated by education, career considerations, or other competing opportunities, the increased risk of infertility associated with later childbearing is itself partly endogenous. In this sense, the resulting childlessness is better viewed as opportunity-cost-driven rather than purely biological.

3 A Model of Coupling and Childlessness

In order to discuss the mechanisms that link determinants of marriage and parenthood, this section presents a simplified model linking marriage and childlessness, building on Baudin, de la Croix, and Gobbi (2015) and Baudin, de la Croix, and Gobbi (2020). We assume a two-stage game. In the first stage, individuals are matched with someone of the opposite sex and decide whether to marry or remain single. In the second stage, singles and couples choose consumption and fertility.

Setup. Individual utility is

$$u(c_i, n) = \ln(c_i) + \ln(n + \nu) \ , \tag{10}$$

where i denotes the gender of individual $i = \{f, m\}$, c_i is the individual's consumption, n the number of children, and $\nu > 0$ a preference parameter.

Couples follow a collective decision model as in Chiappori (1988) and negotiate over their respective consumptions and fertility. Their objective function is

$$U(c_f, c_m, n) = \theta u(c_f, n) + (1 - \theta)u(c_m, n) \ , \tag{11}$$

where θ is the wife's bargaining power. Since we abstract from differences in preferences over children across men and women, θ governs the intra-household distribution of private consumption.

Individuals are subject to two constraints. The first is a feasibility constraint on being fecund and able to carry a child to birth. We assume that, in order to be able to give birth, a woman must consume at least a minimum amount, $\hat{c}$:

$$c_f < \hat{c} \Rightarrow n = 0 \ . \tag{12}$$

This assumption captures the idea that lower-income groups are more often exposed to causes of subfecundity than the rest of the population, for example because of malnutrition, exposure to unhealthy environments, and risky behavior leading to untreated venereal diseases.

The second constraint is the budget constraint. Each adult is endowed with a wage w_i that depends on education and gender. In addition, adults of a given education are heterogeneous with respect to a non-labor income endowment, $a_i > 0$, corresponding to an income source that is uncorrelated with education.

Each household has to pay a maintenance cost, μ. The time endowment is 1 for

married people and $1-\delta_i$ for singles, where δ_i is the time cost that individuals lose due to their singleness. We assume that single women can have children whereas single men cannot and that raising a child entails a time cost ϕ. In couples, we assume that the husband bears a share $1-\alpha$ of child-rearing time.

Given these assumptions, the budget constraints for single men and women are respectively given by

$$c_m = (1-\delta_m)w_m + a_m - \mu \tag{13}$$

and

$$c_f + \phi n w_f = (1-\delta_f)w_f + a_f - \mu \ . \tag{14}$$

The budget constraint of couples is

$$c_f + c_m + \phi n(\alpha w_f + (1-\alpha)w_m) = w_f + w_m + a_f + a_m - \mu \ . \tag{15}$$

The left-hand side of each budget constraint records private consumption and, when relevant, the cost of childrearing. The right-hand side records potential labor income, plus non-labor income, minus the maintenance cost.

Marriage. Coupling is a broad term used to describe a joint living arrangement between two individuals. Next, we use the term marriage to refer to all couples. In our framework, cohabiting individuals are included and treated as indistinguishable from formally married individuals. We acknowledge that different forms of partnership may differ in terms of commitment, cost sharing, mutual insurance against idiosyncratic shocks, and household structure, particularly in the presence of family recomposition (e.g., Blasutto (2024)). These differences are likely to be relevant determinants of fertility behavior and, consequently, of childlessness outcome.

Individuals are matched according to a probability function, which may depend on characteristics such as the education distance between matched individuals, and then decide whether to marry. A match on the marriage market ends in marriage only if both partners are willing to accept it.

In detail, let $\mathcal{M}_f(e_f, a_f, e_m, a_m)$ denote the value for a woman endowed with e_f and a_f of accepting a marriage offer from a man endowed with e_m and a_m. Similarly, let $\mathcal{M}_m(e_f, a_f, e_m, a_m) + \epsilon$ denote the value for a man endowed with e_m and a_m of accepting a marriage with a woman endowed with e_f and a_f, where $\epsilon \in \mathbb{R}$ is a scale parameter accounting for a potential gender-specific surplus in

marriage. When $\epsilon > 0$, males enjoy marriage more than females, everything else being equal, whereas the reverse is true when $\epsilon < 0$.

A match on the marriage market will end up married if and only if

$$\mathcal{M}_f(e_f, a_f, e_m, a_m) \geq \mathcal{S}(e_f, a_f) \quad \text{and} \quad \mathcal{M}_f(e_f, a_f, e_m, a_m) + \epsilon \geq \mathcal{S}(e_m, a_m)$$

where $\mathcal{S}(e_i, a_i)$ denotes the value of being single with education e_i and non-labor income a_i.

Mechanisms Linking Marriage and Childlessness. The model implies several advantages of marriage. First, marriage allows the household maintenance cost μ to be shared. Second, marriage increases the time endowment available to the participants by allowing them to share domestic activities. This is particularly relevant at the bottom and top of the education distribution. For highly educated women, for whom the opportunity cost of being out of the labor market is high, time is a precious asset. A high δ_f therefore increases the incentive to marry. In turn, a high δ_m makes men more interested in marrying, and hence more willing to accept women from the bottom of the education distribution. Third, being married is the only way for men to have children. The lower the preference parameter ν, the more likely men are to accept a match with a woman, almost regardless of her education and non-labor income. Fourth, marriage allows women to reduce the opportunity cost of children. However, a higher participation childcare from men, $1 - \alpha$, can also discourage them from accepting a marriage offer, in particular with low-educated women. Fifth, marriage gives at least one of the partners the opportunity to increase consumption relative to the situation in which he or she remains single. This is particularly relevant for poor women who might have $c_f < \hat{c}$ if single, but whose husbands can allow them to reach a higher level of consumption and thereby gain access to childbearing.

Marriage affects the probability of remaining childless in several ways. First, marriage saves time and money through economies of scale. These economies make having children more accessible to married than to single individuals. Second, there are mechanisms affecting either the low or high ends of the marriage distribution, which therefore affect childlessness at those ends. Low-educated women are more at risk of facing subfecundity-related health issues. Indeed, a higher $\hat{c}$, which may reflect a worse health environment, makes low-educated women more likely to be constrained by the feasibility condition. Hence, the income pooling generated through marriage may allow these women to escape the feasibility

constraint that prevents them from procreating. Educated women face a high opportunity cost of childrearing in terms of foregone labor income. For them, a high α, which could come from a cultural environment in which women are expected to bear most of the childrearing cost, decreases the incentive to have any children. Such a traditional cultural environment can therefore generate a selection effect in the marriage market, where low-educated women become very attractive to highly educated men who can have children at a relatively low opportunity cost in terms of foregone income due to childrearing.

Some parameters are crucial for understanding how marriage and childlessness rates are related. First, a richer economy in terms of non-labor income will display both lower marriage and lower childlessness. Second, a society where the preference parameter ν is higher–reflecting that children are less desired–will exhibit lower marriage rates and higher childlessness rates. Third, a higher housing and maintenance costs μ makes marriage more attractive, but reduces the resources available for having children. In such societies, both marriage and childlessness may be high. Fourth, when men have a relatively higher taste for marriage than women ($\epsilon > 0$), this also pushes childlessness up. Interestingly, this mechanism can also increase marriage rates by introducing selection into marriage: men are more likely to accept matches with women who have a low non-labor income overall, which then increases childlessness rates.

4 Mapping the Literature into the Model

We now discuss the main explanations behind the rise in childlessness proposed by the literature through the lens of our theoretical framework.

The British social scientist Alice Evans argues that the recent rise in childlessness is closely linked to the rise of singlehood. A central mechanism in her explanation is that modern entertainment and digital life reduce the need, and sometimes the opportunity, to form couples. In the past, social life, leisure, and status were more strongly organized around face-to-face interaction. Today, many people can obtain distraction, pleasure, companionship, and even a sense of social recognition through screens, online communities, gaming, streaming, pornography, or social media. These alternatives do not fully replace intimate relationships, but they can lower the incentive to search actively for a partner and make solitude more comfortable. At the same time, if men and women spend less time together in mixed social settings, love itself becomes harder to produce. This interpretation can be connected to the parameter ε in the model above, which captures the extra

surplus from marriage. Read in this way, ε measures the non-material value of forming a couple: love, companionship, intimacy, and mutual support. Evans's argument suggests that modern entertainment may reduce the effective value of this surplus, or reduce the probability that people realize it through actual matches. A fall in effective ε makes marriage less attractive relative to singlehood, thereby increasing childlessness through the extensive margin of union formation, even if fertility preferences within stable couples remain unchanged (Evans 2024c, 2024a, 2024b).

This interpretation is not without critics. Fernández-Villaverde, for instance, does not deny that smartphones, video games, pornography, streaming platforms, and other forms of digital entertainment may have reduced the incentives or opportunities for dating. His scepticism concerns their importance as the main explanation for the decline in partnership and fertility. In his view, the digital-distraction hypothesis is better understood as one possible contributing factor rather than as the central driver of contemporary low fertility. He places greater emphasis on three structural forces: the rising cost of housing, the persistence of mismatched gender norms, and the intensification of educational and status competition. These mechanisms are more directly connected to the economic constraints and bargaining frictions that shape both union formation and fertility decisions (Beckworth 2026).

High housing prices can generate childlessness because housing is often a prerequisite for both union formation and parenthood. A couple may want children, but if renting or buying a sufficiently stable and spacious dwelling absorbs too large a share of their income, the first birth may be postponed; given biological constraints and partnership instability, such postponement may eventually result in permanent childlessness. The empirical literature is consistent with this channel (Dettling and Kearney 2014; Clark 2012; Wijk 2024). This mechanism can be related to the parameter μ in our model, which captures fixed household costs. Interpreting μ as the cost of housing (rent or mortgage payments), an increase in house prices raises the resources that must be devoted to housing before children can be afforded. For singles, a higher μ directly tightens the budget constraint and can push women below the minimum consumption threshold required to have a child. For couples, it also reduces the net resources available for consumption and child-rearing. But because μ is a public good within the household, high housing costs may increase the incentive to form couples in order to share fixed costs. However, when housing becomes too expensive, the resources remaining for childbearing and child-rearing are reduced, thereby increasing childlessness.

Mismatched gender norms can generate childlessness when women's education, wages, and aspirations change faster than the division of childcare within the household. In such a situation, women are increasingly able to pursue work and autonomy, but motherhood still implies that they will bear most of the time cost of children. The conflict is therefore not simply between career and family, but between modern female opportunities and persistent traditional expectations about who should do the unpaid work at home. This can lead women to postpone marriage, postpone the first birth, or refuse motherhood altogether if the expected burden is too unequal. Myong, Park, and Yi (2021) show that in East Asian societies, unequal gender norms in childcare play an important role in low fertility, especially among highly educated women; Goldin (2025) interprets low fertility as partly reflecting a mismatch between women's greater agency and men's limited credible commitment to abandon traditional roles; and Zhou and Xi (2025) model fertility as a "race" between rapid structural transformation and slowly adapting childcare norms. This mechanism maps naturally into the parameter α of our model, where α is the share of child-rearing time borne by women within marriage. A high α means that children are costly mainly in terms of the mother's time and foregone earnings. As women's wages and education rise, keeping α high increases opportunity-driven childlessness: women may be economically able to have children, but prefer not to because the private cost of motherhood is too large.

Another explanation attributes rising childlessness to a weakening of pronatalist norms and to a decline in the ideal family size. In this view, children are not only costly goods; they are also objects of social approval and expected life-course completion. If younger cohorts grow up in societies where small families, one-child families, or childlessness become more visible and acceptable, the psychic cost of having no child falls and the marginal utility of a first child declines. This mechanism maps naturally into the parameter ν of our model. A higher ν makes childlessness less unattractive and lowers the marginal utility of the first child; it therefore captures a weakening of the norm that adulthood should include parenthood. This interpretation is close to the "low-fertility trap" idea, according to which low actual fertility may gradually lower the family-size ideals of subsequent cohorts (Lutz, Skirbekk, and Testa 2006), and to evidence that sub-replacement family-size ideals have appeared in some European contexts (Goldstein, Lutz, and Testa 2003). At the same time, this explanation should probably not be overemphasized. Economists are usually reluctant to explain major aggregate changes mainly by shifts in preferences, because changing tastes are difficult to discipline

empirically and can easily become a residual explanation.[4] In the spirit of Stigler and Becker, and also of Prescott's preference for explanations based on observable technologies, constraints, and institutions, a change in ν is most convincing when it can itself be linked to identifiable mechanisms rather than being treated as an unexplained change in the desire for children (Stigler and Becker 1977; Prescott 1986).

A related preference-based explanation is that childlessness may reflect not only a weaker taste for parenthood, captured here by a higher ν, but also a stronger taste for adult consumption, leisure, autonomy, or self-realization. Formally, this would amount to increasing the weight of consumption or leisure in utility relative to the weight of children, rather than changing only the utility value of $n = 0$. This mechanism is close to the Second Demographic Transition literature, which emphasizes individual autonomy, self-realization, and expressive values as drivers of low fertility (Lesthaeghe 2010). It is also central to the childfree literature, where freedom, lifestyle, identity, and the avoidance of the constraints associated with parenthood are frequently reported motives for remaining childless (Blackstone and Stewart 2012). In economics, Gobbi (2013) models voluntary childlessness through heterogeneous preferences for children, while Brée and Croix (2019) show, in the historical case of Rouen before the Industrial Revolution, that an increase in "materialism"—interpreted as greater access to superior goods and elite social life—can generate both lower fertility and higher childlessness. Evidence on the leisure channel remains mixed: Her and Chen (2026) find that leisure aspirations are associated with later ideal ages for parenthood among women, but not with stronger approval of voluntary childlessness.

Economic uncertainty has also been shown to reduce fertility and increase childlessness. Higher income risk raises the option value of postponing the irreversible commitment represented by childbearing, leading individuals to delay marriage and fertility decisions (Ranjan 1999a; Pommeret and Smith 2005; Santos and Weiss 2016; Sommer 2016). Empirically, economic downturns, unemployment, job insecurity, and greater volatility in economic conditions are generally associated with lower fertility. Most of the literature, however, has focused on the role of economic uncertainty in delaying fertility rather than on its effects on completed

4. A related literature uses migrants and their descendants to identify the persistence of inherited fertility norms. Fernández and Fogli (2006) show that fertility norms from the country of ancestry predict fertility behaviour among descendants of immigrants in the United States. Closer to the extensive margin, Stichnoth and Yeter (2016) find for Germany that origin-country fertility predicts completed fertility among first- and second-generation immigrants, with evidence that the effect operates more strongly through childlessness in the second generation.

fertility and childlessness (Hofmann and Hohmeyer 2013; Currie and Schwandt 2014; Clark and Lepinteur 2022).

Today, uncertainty about the future, centered around ecological and political turmoils, provides another explanation for the rise in childlessness, but it does not map neatly into a single parameter of the above model. The reason is that uncertainty mainly changes the timing of fertility decisions, whereas the model describes a one-period choice over marriage, fertility, and childlessness. Economic or housing uncertainty lowers expected resources and can therefore operate like a higher fixed cost of household formation, close to μ. Uncertainty about partnership stability lowers the expected surplus from marriage, close to ε. Uncertainty about employment and career prospects increases the perceived opportunity cost of child-rearing, close to w_f and w_m. But the distinctive mechanism is postponement: when having a child is costly, partly irreversible, and risky, individuals may prefer to wait until conditions become clearer. This is the logic of the option-value approach to fertility, developed by Ranjan (1999b) and de la Croix and Pommeret (2021): delaying childbearing can be optimal under uncertainty, but because fecundity declines with age, repeated postponement may end in definitive childlessness. This channel is also consistent with evidence that economic uncertainty lowers completed fertility by encouraging later marriage and later births (Chabé-Ferret and Gobbi 2026).

Along this line of research, Chabé-Ferret and Gobbi (2026) show that changes in economic uncertainty help explain two major deviations from the smooth downward trend of the fertility transition in the United States: the baby bust experienced by cohorts of childbearing age during the Great Depression and the post-WWII baby boom. During the baby boom, completed fertility rose from 2.25 children among women born in 1910 (the trough of the baby boom) to 3.13 among those born in 1933 (its peak), while childlessness declined from 20.5% to 10.7%. The authors estimate that the decline in economic uncertainty following the Great Depression explains 67.5% of the increase in completed fertility and 39% of the reduction in childlessness. Interestingly, the socio-economic groups most affected by economic uncertainty have changed over the twentieth century. Among cohorts born at the beginning of the century, the effect of economic uncertainty on fertility was concentrated among the most educated women. These women responded to economic uncertainty by remaining single, delaying family formation, and becoming more likely to remain childless. By contrast, for more recent cohorts, the effect of economic uncertainty on fertility has weakened, as alternative mechanisms for coping with uncertainty, such as social safety nets and

financial development, have become more widespread.

5 Conclusion

Childlessness has become a central margin of contemporary low fertility. This chapter has argued that its rise should not be interpreted only through completed cohort measures, which are observed with a long delay. A period perspective is also needed. The Total Childlessness Rate proposed here provides such a perspective by summarizing the age-specific first-birth conditions prevailing in a given year. Although this measure should not be read as a forecast for any actual cohort, it reveals a sharp deterioration in the current conditions of entry into parenthood in the countries for which parity-specific data are available.

The chapter has also emphasized that childlessness is not a homogeneous state. Chidlessness may reflect biological constraints, insufficient resources, high opportunity costs, the absence of a suitable partner, or the loss of children before adulthood. Distinguishing these mechanisms is important because they have different empirical signatures and different policy implications. A rise in poverty-driven childlessness points to constraints in resources, health, or housing. A rise in opportunity-cost-driven childlessness points to the incompatibility between parenthood and women's economic opportunities. Marriage-market childlessness points instead to changes in the formation, stability, or desirability of couples.

Finally, the model-based approach developed in this chapter provides a common language for organizing recent explanations of rising childlessness. Declining partnership surplus, high housing costs, unequal gender norms, weaker pro-natalist preferences, and uncertainty about the future do not operate through the same channels. Some affect the probability of forming a couple; others affect the cost of children within couples; still others affect the timing of first births and may turn postponement into permanent non-parenthood. This perspective suggests that no single explanation is likely to account for the rise in childlessness across all countries. The task for future research is therefore to quantify the relative importance of these mechanisms across institutional settings and to understand which policies can reduce unwanted childlessness without restricting the expanded life choices that have made parenthood a genuinely optional state.

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