Working Mothers, Social Norms, and Fertility*

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Abstract

In high-income economies, the cross-country relationship between women's labor force participation and fertility has reversed in recent decades: countries where many women work used to have fewer children, but now they have more. One potential force behind this reversal is the evolution of social norms. Whereas in the past social norms favoring traditional gender roles and hence low female labor force participation where prevalent in many countries, over time social norms have shifted more in some countries than in others. In this paper, we develop a model where women's labor force participation, fertility, and social norms governing these choices are jointly determined. The theory provides a new interpretation of recent fertility trends and leads to new insights about the short- and long-term consequences of policy interventions.

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1 Introduction

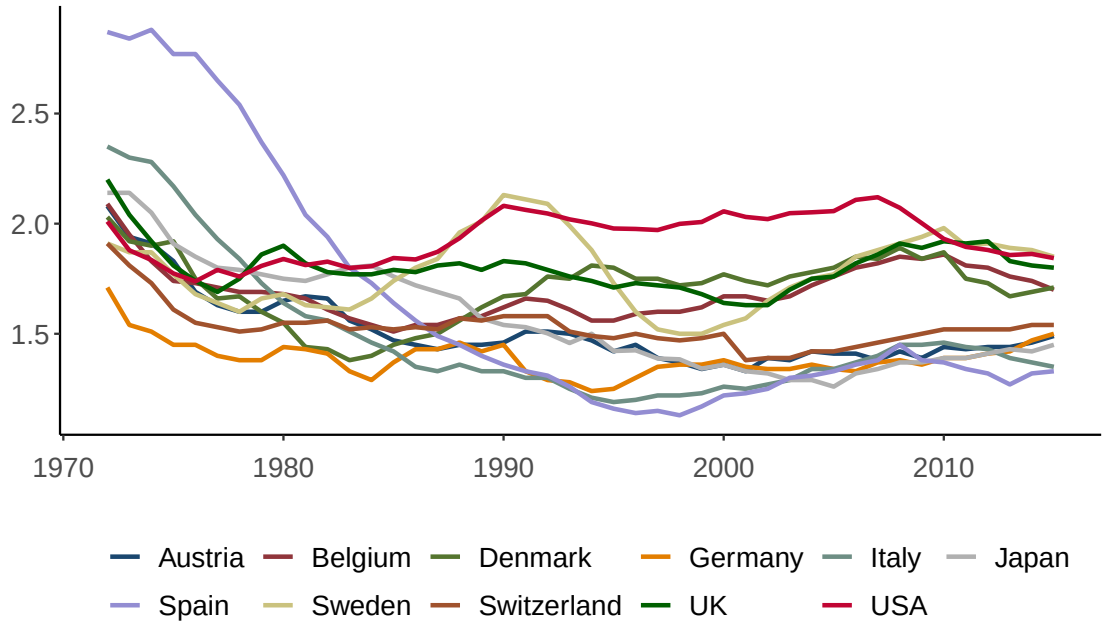
From the 1960s to the present, families in high-income countries have gone through a remarkable transformation. At the beginning of this period, the traditional single-earner family was still dominant; the labor force participation rate of married women was low, and conversely married men did little childcare or housework. Since then, married women's labor force participation has risen substantially, and is close to that of men in many countries. Time use data show that while women continue to provide the majority of childcare and housework, men's contributions to this task have increased greatly over the same time period.

Basic economic models of fertility would suggest that such a transformation in the division of labor in the family should lead to a substantial decline in fertility rates. The increase of mothers' labor force participation implies a rise in the opportunity cost of raising children, and if more childcare is done by men (who have higher wages on average) that would increase the cost of children even more. Consistent with this idea, at the beginning of the period under consideration there was a clear negative relationship between women's labor force participation and fertility rates at a country level.

Nevertheless, the evolution of fertility rates since the 1960s contradicts the notion of a simple, monotonic relationship between women's labor force participation and fertility. First, as shown in Figure 1, fertility rates have been broadly stable in high-income countries since the 1980s, even though women's labor force participation has continued to increase. Second, as documented by Doepke et al. (2022) and others, over the same period the cross-country relationship between women's labor force participation and fertility has reversed: from the late 1980s onwards, countries where more women work had higher fertility rates compared to countries where the traditional division of labor prevails.

The aim of this paper is to evaluate the role of social norms in accounting for the evolving relationship of the division of labor in the family and fertility behavior. To this aim, we develop a model in which fertility behavior is shaped both by traditional economic forces and by social norms that concern the role of women and men in raising children. We are particularly interested in capturing the joint evolution of family behavior and social norm over time. As women's labor force participation has risen, social norms have also gone through major changes, in ways that are suggestive of two-way causality between norms and family behavior. Our model captures these mutual influences and

Figure 1: Total Fertility Rates since 1970



Notes: Data from the World Bank World Development Indicators database.

aims to quantify them by matching the dynamics of family behavior and social norms in high-income countries.

To illustrate the role of social norms in shaping fertility and women's labor supply, we consider data from the International Social Survey Programme (ISSP). The ISSP has three waves in 1992, 2002, and 2012. We focus on questions that concern the role of mothers in raising children. Specifically, respondents are asked whether "children suffer whem moms work" and they are asked whether they agree with the statement that "mothers shouldn't work when kids are small." There is substantial cross-country variation in the answers to the these questions, and Figures 2 to 5 show that the answers are highly correlated with fertility rates: countries where more people display social norms against working mothers have lower fertility.

The ISSP are also informative for how social norms change over time. Traditional social norms are more prevalent in the earlier survey waves and among older respondents. By considering variation both across ages and across survey waves, we can decompose the overall change in social norms over time in cohort and time effects. Figures 6 and 7 show how the change in social norms across cohorts correlates with fertility rates. The figures show that countries with that experienced larger shifts in social norms toward

Figure 2: Social norm against working mothers and total fertility rate across countries (Children suffer when moms work)

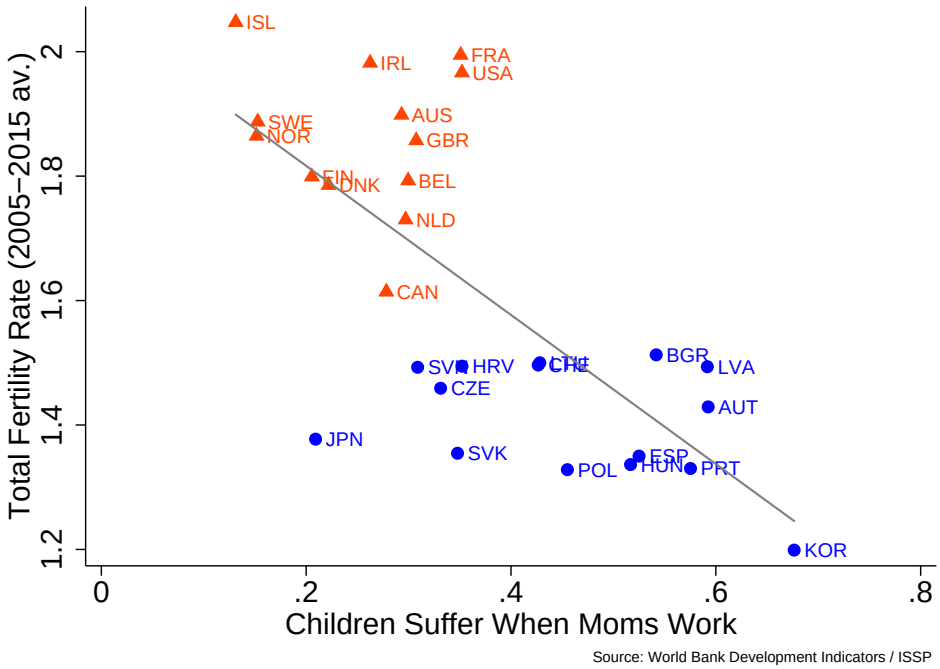


Figure 3: Social norm against working mothers and total fertility rate across countries (Children suffer when moms work) respondents up to age 45

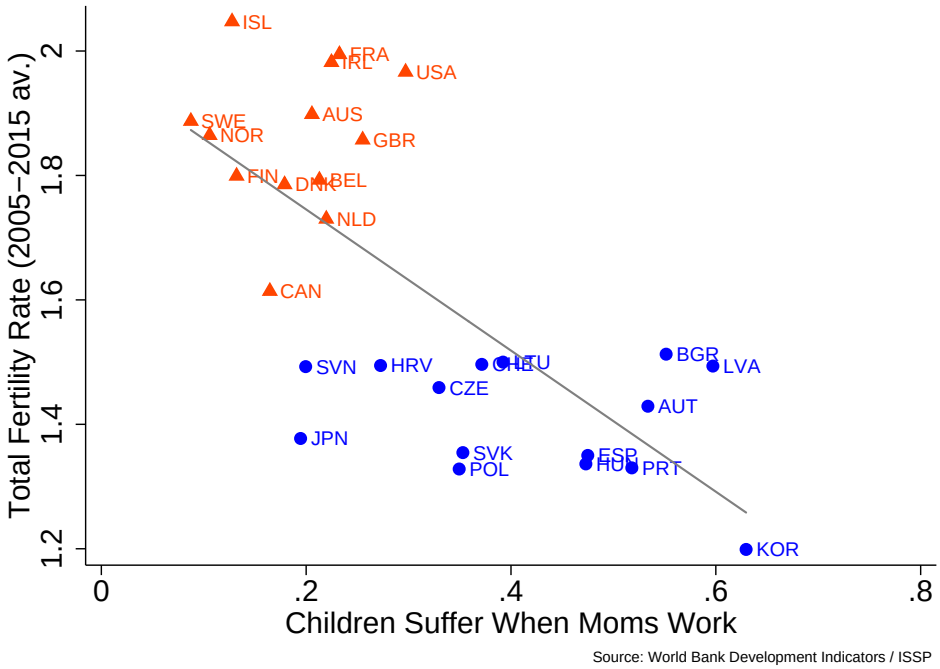


Figure 4: Social norm against working mothers and total fertility rate across countries (Moms should stay home when children are small)

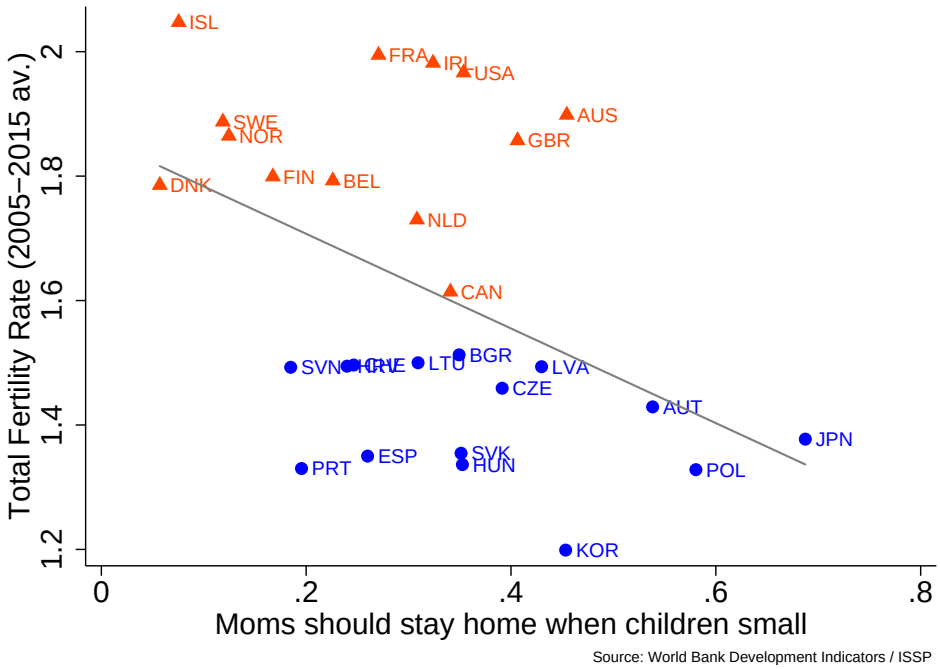
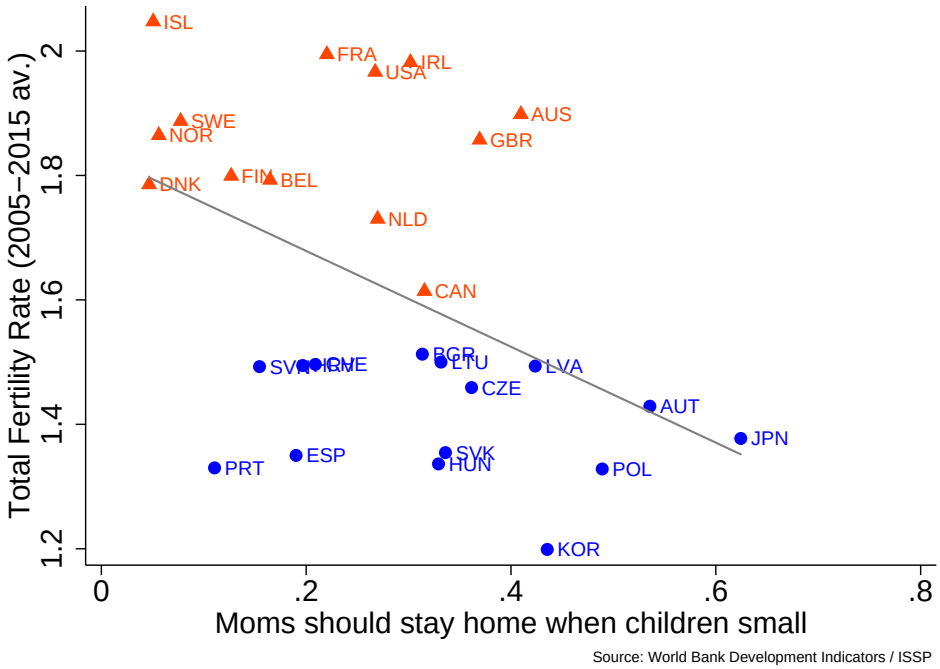


Figure 5: Social norm against working mothers and total fertility rate across countries (Moms should stay home when children are small) respondents up to age 45



broad acceptance of working mothers today have higher fertility rates. This pattern is consistent with the notion that in countries with more favorable social norms women perceive less of a conflict between their career aims and having a family, and higher fertility results.

The countries that experienced larger shifts in social norms also experienced an earlier rise in women's labor force participation, which suggests a dynamic interaction between women's decision to work and social norms that hinge on this decision. Below, we develop a model that spells out such an interaction.

In addition to using this model for a positive analysis of the mutual evolution of fertility, social norms, and women's labor force participation in different countries, we aim to use this model for policy analysis. Specifically, the model suggests that policies that encourage women to work and facilitate combining a career with having a family will ultimately have a positive effect on fertility through the endogenous evolution of social norms. This positive effect can arise even if the immediate policy effect is small or even negative. Understanding such long-run policy effects may be beneficial for understanding the role of historical policy decisions in accounting for the different trajectories in countries' fertility rates that are evident in Figure 1.

2 Social Norms and Mothers' Labor Supply in a Model of Fertility Choice

We employ a simplified version of the dynamic model of Doepke and Kindermann (2019). We assume a household to consist of a wife f and a husband m. Each partner has their own preferences

$$u_f(c_{f,t}, n_t, h_t) = c_{f,t} + n_t\nu_f + n_t(1-h_t)S_t \quad \text{and} \quad u_m(c_{m,t}, n_t, h_t) = c_{m,t} + n_t\nu_m.$$

$c_{f,t}$ and $c_{m,t}$ denote the partners' individual consumption levels. $n_t \in \{0,1\}$ is the couple's fertility decision. For simplification we assume that a couple makes only one decision regarding child birth and they only decide whether to have children or not. $h_t \in [0,1]$ is the share of child care the wife provides at home. Consequently, $1-h_t$ is the share of child care bought on the market.

We let $S_t \geq 0$ be a social norm that may hinder women from working while having children. We think of this norm as being a utility or stigma cost that materializes, whenever mothers purchase child care on the market. The formulation we choose here is the

Figure 6: Change in social norm across cohorts and total fertility rate across countries (Children suffer when moms work)

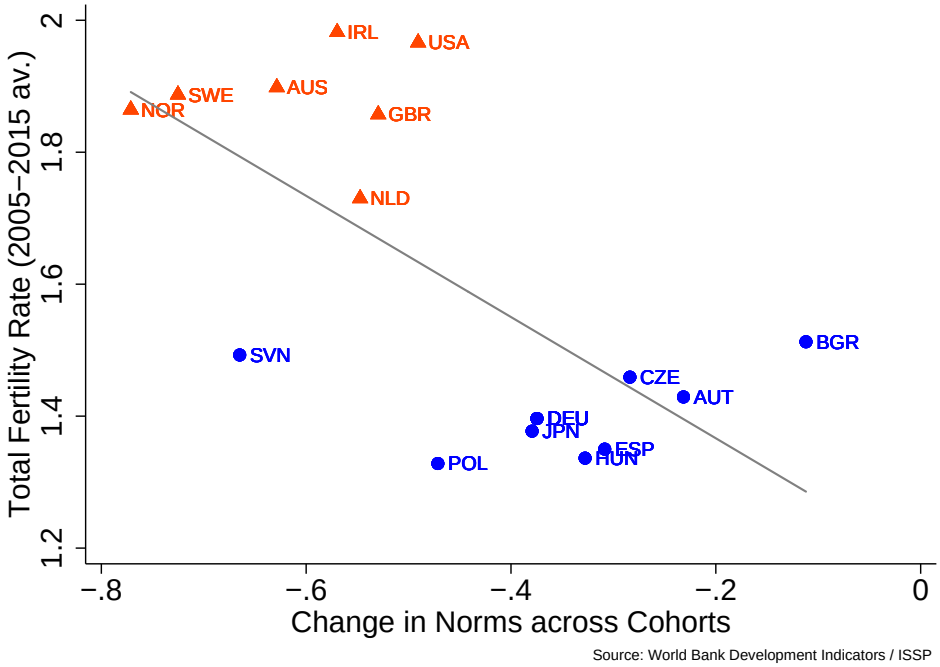
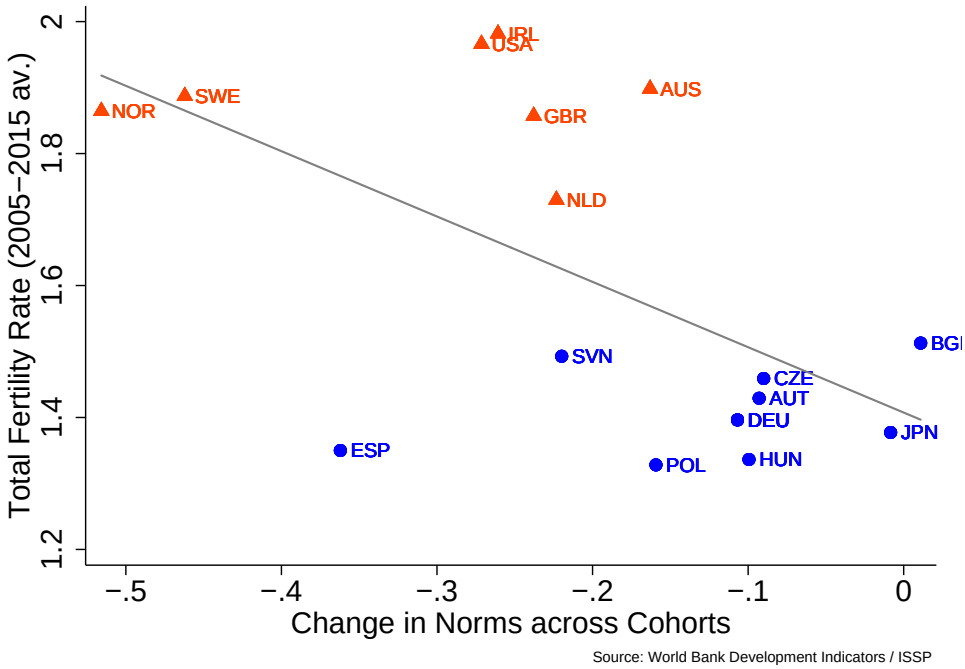


Figure 7: Change in social norm across cohorts and total fertility rate across countries (Moms should stay home when children are small)



most simple one. It is in line with the empirical evidence that in countries with low total fertility rates, people tend to think that children suffer when mother work. It also coincides with the anecdotal evidence of stigma against working mothers in countries like Germany, where the term "Rabenmutter" ("raven mother") is frequently used almost as an insult to working mothers that rely predominantly on market-based child care.[1] We allow this social norm to move over time, which we specify in more detail below.

The household's joint budget reads

$$c_{f,t} + c_{m,t} = (1 + \alpha) \left[w_{f,t} + w_{f,t} - nhw_{f,t} - n(1 - h)p \right],$$

where $w_{f,t}$ and $w_{m,t}$ denote the wages of both partners, respectively. p is the cost of market-provided child care. A consensual consumption decision creates economies of scale for the households in the extent of α.

2.1 The couple's decision problem

Couples decide about their child-care arrangement, fertility and the consumption allocation in sequential order:

1. As a benchmark, partners follow an efficient decision rule for child care, meaning that they will choose to purchase all child care on the market, if this is cheaper (in utility terms) than having the mother care for the kids at home. However, when the wife is on the fence with her fertility decision, and the default option would be for her to care for the kids at home, the husband may offer to buy child care on the market. While this may come with a higher overall cost for the household, it can lower the child-care costs of the mother and therefore convince her to agree to having children.

2. In the second step, the couple decides about whether to have children or not, based on the first-stage agreed child-care arrangement. Each partner has a veto-right in the child birth decision, meaning that both partners have to generate a higher utility from having a child then from remaining childless.

3. Finally, the couple bargains on a consumption allocation. It does so after the child has been born. Consequently, each partner's outside option depends on the child-care arrangement made at stage one and the fertility decision at stage two.

[1] There are alternative ways to specifying social norms in the context of child care, see Doepke et al. (2022) for an overview.

We will now go through each of the steps of the decision problem in reverse order.

The consumption bargaining problem Before determining the consumption allocation, we have to specify the outside options of both partners. As mentioned above, the bargaining problem takes place after the child has been born and all arrangements were made. Consequently, we can write the outside option of wife and husband as

$$\begin{aligned}\bar{u}_f(n_t, h_t) &= w_{f,t} - n\left[hw_{f,t} - \chi_f(1-h)p + \nu_f - (1-h)S_t\right] \quad \text{and} \\ \bar{u}_m(n_t, h_t) &= w_{m,t} - n\left[(1-\chi_f)(1-h)p + \nu_m\right].\end{aligned}$$

χ_f determines the share by which partners split the monetary cost of market-based child care when bargaining breaks down. This share may be determined by legal regulation or simply an ex ante agreement. Note that we assume that neither partner can change the child-care arrangement ex post.

Couples determine their consumption allocation by Nash bargaining, i.e. they solve

$$\max_{c_{f,t}, c_{m,t}} \left[u_f(c_{f,t}, n_t, h_t) - \bar{u}_f(n_t, h_t)\right]^{0.5} \times \left[u_m(c_{m,t}, n_t, h_t) - \bar{u}_f(n_t, h_t)\right]^{0.5}.$$

We assume equal weights in the bargaining function. The outcome of the bargaining problem is

$$c_f = w_{f,t} + \frac{\alpha}{2}(w_{f,t} + w_{m,t}) - nd_f(h_t) \quad \text{and} \quad c_m = w_{m,t} + \frac{\alpha}{2}(w_{f,t} + w_{m,t}) - nd_m(h_t), \quad (1)$$

where

$$d_f(h_t) = \left(1 + \frac{\alpha}{2}\right) h_t w_{f,t} + \left(\chi_f + \frac{\alpha}{2}\right)(1-h_t)p + (1-h_t)S_t \quad \text{and} \quad (2)$$

$$d_m(h_t) = \frac{\alpha}{2} h_t w_{f,t} + \left(1 - \chi_f + \frac{\alpha}{2}\right)(1-h_t)p \quad (3)$$

denote the total cost of having children for each partner, respectively. As a result, we can write utility at stage three as

$$\tilde{u}_g(n_t, h_t) = w_{f,t} + \frac{\alpha}{2}(w_{f,t} + w_{m,t}) + n\left[\nu_g - d_f(h_t)\right]. \quad (4)$$

The decision to have children Comparing their utility without and with children in (4), we immediately see that each partner prefers to have kids when

$$v_f \geq d_f(h_t) \quad \text{and} \quad v_m \geq d_m(h_t).$$

In this simplified example, we assume that the husbands preference for children v_m is such that $v_m \geq d_m(h_t)$. Assuming that both partners have a veto option, the (potential) mother is always pivotal for the fertility decision. We will relax this assumption later on. Consequently, the couple will have children if and only if

$$v_f \geq \left(1 + \frac{\alpha}{2}\right) h_t w_{f,t} + \left(\chi_f + \frac{\alpha}{2}\right)(1 - h_t)p + (1 - h_t)S_t \tag{5}$$

holds.

Childcare arrangements There is a clear efficient choice of childcare arrangement from the joint household perspective. The best choice to make is to care for children at home whenever the (opportunity) cost of the mother staying at home is smaller than the market price for childcare plus the potential cost of the social norm. We use this decision as a benchmark for the household childcare arrangement, i.e., we use

$$h_t^{\text{bench}} = \begin{cases} 1 & \text{if } (1+\alpha)w_{f,t} < (1+\alpha)p + S_t \\ 0 & \text{otherwise} \end{cases}$$

as a benchmark allocation. There are, however, certain circumstances in which departing from this efficient rule can be beneficial for both partners. This is the case when

$$(1+\alpha)w_{f,t} < (1+\alpha)p + S_t \quad \text{and} \quad \left(\chi_f + \frac{\alpha}{2}\right)p + S_t < \left(1 + \frac{\alpha}{2}\right) w_{f,t}$$

hold simultaneously. In this situation, it would be efficient from a joint household perspective to have the mother care for children at home. Owing to the different division of home care and market care costs, the mother would yet prefer to have the child cared for in a child care institution. Recall that we assumed that the husband is always in favor of having children, regardless of the child care arrangement. Hence, in the above situation, the husband may offer the wife to buy child care on the market, even if this results in higher overall costs for the household. This is a dominant strategy whenever

the mother is on the fence with her fertility decision, meaning that

$$\left(\chi_f + \frac{\alpha}{2}\right) p + S_t < v_f < \left(1 + \frac{\alpha}{2}\right) w_{f,t}.$$

Mothers with a child preference below this lower bound do not agree to having children anyway, and mothers with a preference greater than the upper bound will even consent to child birth when caring for the children at home.

2.2 Aggregation and Dynamics of the Social Norm

For now, we assume that at any point in time, all women have the same wage rate $w_{f,t}$.[2] In order to aggregate individual decisions to economy-wide choices, we assume that fertility preferences v_f are distributed across all women according to a normal distribution with mean μ_f and standard deviation σ_f. Consequently, the share of couples that decides to have children is

$$N_t = P(\{v_f \geq d_f(h_t)\}) = 1 - N_{\mu_f, \sigma_f^2}(d_f(h_t)),$$

where

$$d_f(h_t) = \begin{cases} \left(1 + \frac{\alpha}{2}\right) w_{f,t} & \text{if } (1+\alpha) w_{f,t} < (1+\alpha) p + S_t \\ & \quad \text{and } \left(1 + \frac{\alpha}{2}\right) w_{f,t} < \left(\chi_f + \frac{\alpha}{2}\right) p + S_t \\ \left(\chi_f + \frac{\alpha}{2}\right) p + S_t & \text{otherwise.} \end{cases}$$

We can furthermore write the aggregate share of couples that only has the mother care for the children at home as

$$H_t = \begin{cases} 1 & \text{if } (1+\alpha) w_{f,t} < (1+\alpha) p + S_t \\ & \quad \text{and } \left(1 + \frac{\alpha}{2}\right) w_{f,t} < \left(\chi_f + \frac{\alpha}{2}\right) p + S_t \\ 1 - \frac{N_{\mu_f, \sigma_f^2}\left(\left(1+\frac{\alpha}{2}\right) w_{f,t}\right) - N_{\mu_f, \sigma_f^2}\left(\left(\chi_f + \frac{\alpha}{2}\right) p + S_t\right)}{1 - N_{\mu_f, \sigma_f^2}\left(\left(\chi_f + \frac{\alpha}{2}\right) p + S_t\right)} & \text{if } (1+\alpha) w_{f,t} < (1+\alpha) p + S_t \\ & \quad \text{and } \left(\chi_f + \frac{\alpha}{2}\right) p + S_t < \left(1 + \frac{\alpha}{2}\right) w_{f,t} \\ 0 & \text{otherwise.} \end{cases}$$

[2] We will relax this assumption in future iterations of this work.

Finally, we assume that the social norm evolves over time as

$$S_{t+1} = (1 - \omega)S_t + \omega H_t.$$

Assuming that $S_0 = 1$, when all mothers decide to care for their children at home, the norm will not deviate from its starting value. The more couples decide to make use of market-based child care ($H_t < 1$), however, the more will the norm drift towards a value of zero over time. ω is the transition speed by which the norm adjusts to changes in child care use in the population.

2.3 Some illustrative simulations

In this section, we provide some first illustrative simulations to investigate the underlying model mechanics and their sensitivity to some model parameters. To this end, we set the scale parameter in couple's consumption to $\alpha = 0.4$ as in (Greenwood, Guner, and Knowles 2003). We let the mean and standard deviation of child preferences for women be $\mu_f = 1.5$ and $\sigma_f = 0.5$. The cost of child care are $p = 0.75$ and we assume that the monetary costs of child care are shared equally by partners, i.e. $\chi_f = 0.5$.

Our thought experiment is the following. We start with a situation around the beginning of the 20th century, where married women essentially had no opportunity to engage in market work. We consequently set $w_{f,1900} = 0$. In addition, since essentially all mothers cared for their children at home, we let the social norm regarding child care arrangements be $S_{1900} = 1$ as well. We then let the economy go on a transition path along which the labor market opportunities of women increases successively, meaning that their wage rises over the time span of a century from 0 to 1.4. In the end, the woman's market wage hence is almost twice the cost of buying child care on the market. After the year 2000, female wages stagnate at a value of 1.4.

Our first experiment is one in which the social norm towards child care provision is entirely inelastic to aggregate economic behavior, meaning that $\omega = 0$. Figure 8 shows such a situation. The grey vertical lines mark different regimes of the model. Before 1900, the economy is in a steady state with almost all married couples choosing to have children. As female wages start increasing from 1900 onward, the opportunity costs having children rises and therefore the fertility rate drops. After almost a century, the fraction of couples that decide to have children has almost halved. The transition process stops (indicated by the second vertical line) about ten years before the wage transition is over.

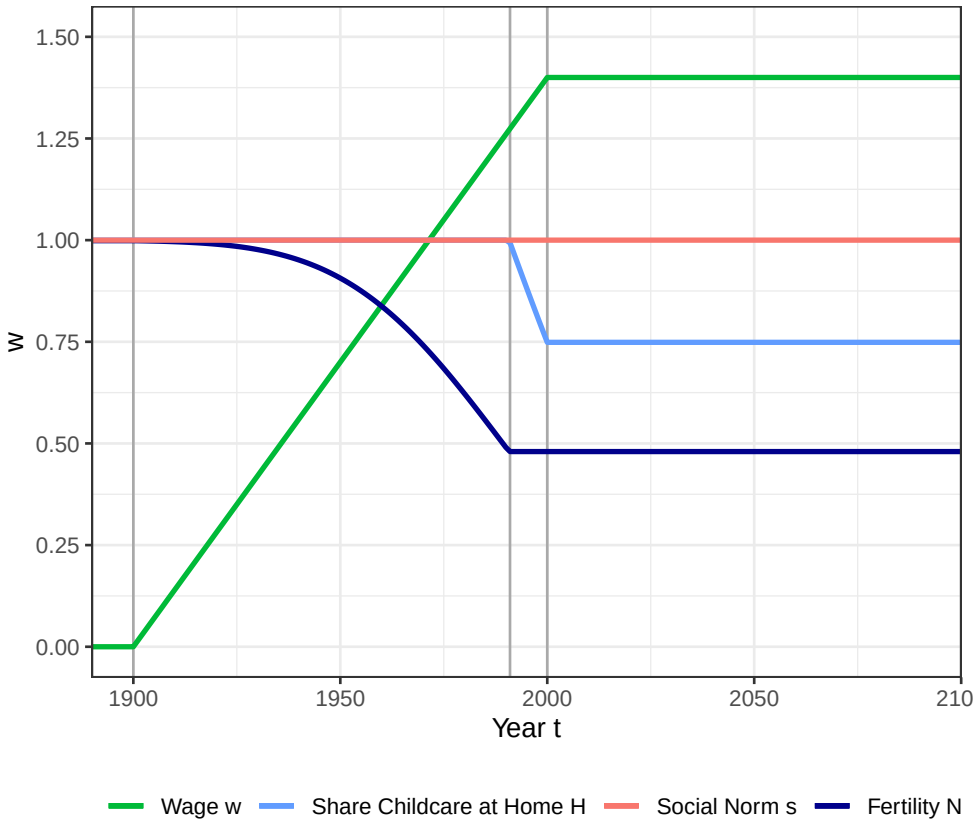


Figure 8: Model dynamics with inelastic social norms ($\omega = 0$)

This is owing to the bargaining between couples. At this point, female wages are not high enough that all couples should choose to purchase child care on the market, but they are close. As a result, in couples where the woman is at the fence of blocking the fertility decision, husbands will opt to purchase child care on the market to convince the future mother of having kids. The entire transition ends with the transition of wages in 2000. This is because the social norm is inelastic to household's behavior. At the end of the transition, a quarter of couples decide to make use of market-based child care.

The situation changes when we allow the social norm to react to household's choices, as can be seen in Figure 9. In the left panel of this figure, we assume that $\omega = 0.005$. The existence of a dynamic social norm hardly impacts on the first phase of the fertility transition. In fact, until some households adopt market-based child care in around 1990, the model dynamics are exactly identical to the case with an inelastic norm. The subsequent phases of the fertility transition, however, look quite different. As soon as households start purchasing child care on the market, the social norm towards caring

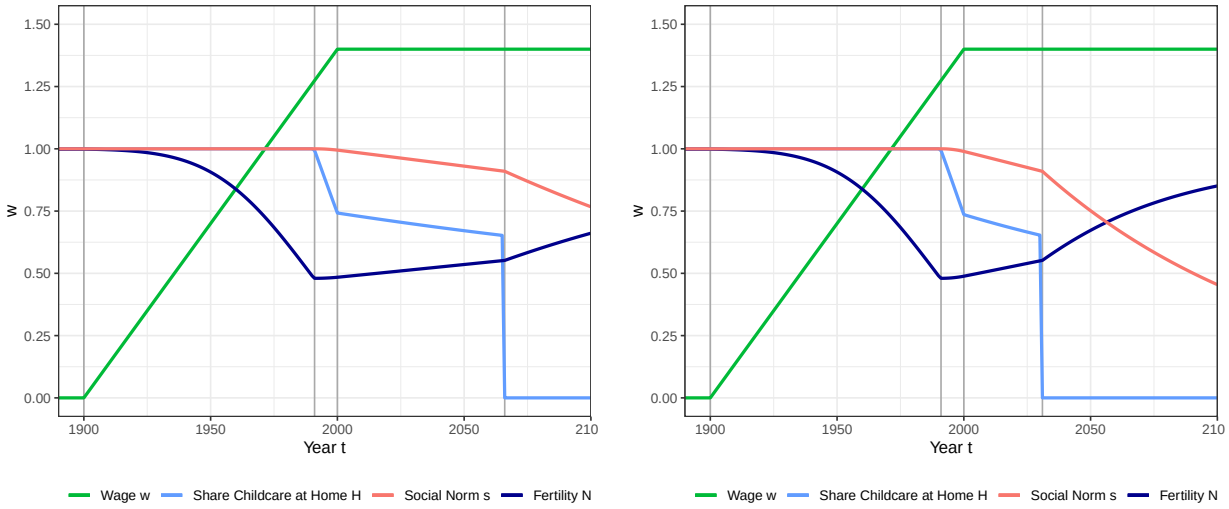


Figure 9: Model dynamics with elastic social norm (left: $\omega = 0.005$, right: $\omega = 0.01$)

for children at home slowly disappears. As opposed to the previous simulations, there now is a thirds and fourth phase of the fertility transition. The third phase starts once the wage transition has ended. It is characterized by a slowly increasing adoption of market-based childcare an a slight rise in total fertility. The last phase of the transition then features all households buying child care on the market. This regime switch causes the social norm to move much faster than before, which means that total fertility enhances more quickly. As can be seen from the right panel of the figure, the length of the third and fourth transition phases crucially depends on the speed ω at which the social norm changes over time.

3 Outlook

The presented model gives an overview of the key features a model of the fertility transition and the role of social norm will need. It can also illustrate the main mechanisms at work that lead to a U-shape in fertility over time (and potentially also in the cross-section). Yet, to perform a full quantitative analysis, the model needs some further extensions, like heterogeneity in male and female wages, preference heterogeneity for men, potential changes in the price and quality of child care institutions, an intensive margin of fertility decisions, etc. We are planing to provide a quantitative model like this which we can use to study fertility transitions in different countries.

To estimate the parameters of such a model, we will have to use additional data, both in time series and cross-sectional format. The ultimate goal of this analysis is to

1. characterize the validity of our model by, e.g., looking at its implications for the motherhood wage penalty in different countries, which we could again compare to recent data for example from (Kleven et al. 2019),
2. understand the dynamics of social norms and their importance in shaping the fertility transition across different countries,
3. provide an outlook for the future of fertility rates, and
4. study the role and efficacy of public policies aimed at raising fertility rates, both in the short- and the long run.

References

Bar, Michael, Moshe Hazan, Oksana Leukhina, David Weiss, and Hosny Zoabi. 2018. "Why did Rich Families Increase their Fertility? Inequality and the Marketization of Child Care." *Journal of Economic Growth* 23 (4): 427–463.

Cohen, Alma, Rajeev Dehejia, and Dmitri Romanov. 2013. "Financial Incentives and Fertility." *Review of Economics and Statistics* 95 (1): 1–20.

Da Rocha, José María, and Luisa Fuster. 2006. "Why are Fertility Rates and Female Employment Ratios Positively Correlated Across OECD Countries?" *International Economic Review* 47 (4): 1187–222.

de Laat, Joost, and Almudena Sevilla-Sanz. 2011. "The Fertility and Women's Labor Force Participation Puzzle in OECD Countries: The Role of Men's Home Production." *Feminist Economics* 17 (2): 87–119.

Doepke, M., A. Hannusch, F. Kindermann, and M. Tertilt. 2022. The Economics of Fertility: A New Era. NBER Working Paper No. 29948.

Doepke, M., and F. Kindermann. 2019. "Bargaining over Babies: Theory and Application to Fertility in Europe." *American Economic Review* 109 (9): 3264–3306.

Doepke, Matthias, and Michèle Tertilt. 2016. "Families in Macroeconomics." Chapter 23 of *Handbook of Macroeconomics, Vol. 2*, edited by John Taylor and Harald Uhlig. North Holland.

Feyrer, James, Bruce Sacerdote, and Ariel Dora Stern. 2008. "Will the Stork Return to Europe and Japan? Understanding Fertility within Developed Nations." *The Journal of Economic Perspectives* 22 (3): 3–22.

Greenwood, Jeremy, Nezih Guner, and John Knowles. 2003. "More on Mariage, Fertility, and the Distribution of Income." *International Economic Review* 44 (3): 827–862.

Hazan, Moshe, and Hosny Zoabi. 2015. "Do Highly Educated Women Choose Smaller Families?" *The Economic Journal* 125 (587): 1191–1226.

Kleven, Henrik, Camille Landais, Johanna Posch, Andreas Steinhauer, and Josef Zweimuller. 2019. "Child Penalties Across Countries: Evidence and Explanations." *AEA Papers & Proceedings* 109:122–126.

Laroque, Guy, and Bernard Salanié. 2014. "Identifying the Response of Fertility to Financial Incentives." *Journal of Applied Econometrics* 29 (2): 314–332.

Raute, Anna. 2018. "Can Financial Incentives Reduce the Baby Gap? Evidence from a Reform in Maternity Leave Benefits." *Forthcoming, Journal of Public Economics*.

Siegel, Christian. 2017. "Female Relative Wages, Household Specialization and Fertility." *Review of Economic Dynamics* 24:152–174.