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LABOR MARKET INSTITUTIONS AND FERTILITY*

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Some high-income countries have total fertility rates as low as one child. Using Spanish administrative data, we document that temporary contracts correlate with lower first birth rates. Also, women with children are less likely to work split-shift jobs with long breaks in the middle of the day. We build a life-cycle model where women decide on labor supply and fertility. We show that reforms eliminating duality or split-shift jobs raise women's labor participation, narrow the employment gap between mothers and nonmothers, and boost fertility for working women. These reforms, together with childcare subsidies, increase married women's fertility to 1.8 children.

1. INTRODUCTION

The total fertility rate (TFR) has been falling everywhere in the world. It is 1.8 in the US, 1.6 in Germany, and 1.4 in Japan, well below the replacement rate of 2.1 children per woman.[1] The TFR in some European countries, such as Greece, Italy, Portugal, and Spain, is even lower, around 1.3 children, which is what demographers call the lowest-low fertility (Kohler et al., 2002). Yet, the desired number of children by females in these countries remains about 2, much higher than the observed TFR.

Population aging, low fertility coupled with high life expectancy, have been associated with a host of economic woes: low interest rates, low economic growth, and growing deficits of social security systems around the world (see, among others, Krueger and Ludwig, 2007, Aksoy et al., 2019, and Jones, 2022). These concerns make understanding why women choose such low fertility rates essential.

In this article, we study how labor market inflexibility and uncertainty affect fertility decisions. Growing evidence from surveys and experiments suggests that women prefer greater

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[1] See: OECD Family Database, Tables SF2.1.A, SF2.3.B, SF2.2.A, http://www.oecd.org/els/family/database.htm.

work flexibility and job stability.[2] Goldin (2014) emphasizes that labor market inflexibility, measured as requirements to work long and particular hours, reduces the female labor supply and increases the gender wage gap, particularly for skilled occupations. One way women can cope with inflexibility in the labor market is to have fewer children. Across the OECD countries, higher flexibility (ability to adjust working hours) is associated with higher fertility (Figure B1 in Online Appendix B).

Another reason for low fertility is economic uncertainty and women's inability to start and establish stable labor market career delays and lower fertility. High unemployment is associated with low fertility (Ahn and Mira, 2001; Adsera, 2011; Currie and Schwandt, 2014), and higher gender gaps in employment and unemployment are associated with lower fertility across countries (Figure B2 in Online Appendix B). Job displacements reduce fertility (Del Bono et al., 2012, 2015), and the effect is more substantial for women in skilled occupations.[3] In many European countries, dual labor markets contribute significantly to economic uncertainty for women in their childbearing years. In a dual labor market, young workers hold temporary jobs that can last up to a couple of years and then move to another temporary position until they settle on an open-ended (permanent) contract. Fertility and the fraction of women who work with a temporary contract are negatively correlated across OECD countries (Figure B3 in Online Appendix B), and several empirical studies show that temporary jobs are negatively correlated with fertility.[4]

Our analysis is based on Spain, an ideal case to understand the effects of labor market institutions on fertility and labor market outcomes. Even among high-income countries with low fertility rates, Spain stands out as the country with the highest incidence of childlessness and the lowest share of women with two or more children (Figure B4 in Online Appendix B). The gender gaps in employment and unemployment rates are also high in Spain. For ages 25 to 54, the gender gap in the employment-to-population ratio was 12.2 percentage points in 2018, whereas the gap was 9.1, 8.4, and 4.6 percentage points in France, Germany, and Sweden, respectively. For the same age group, women's unemployment rate was 3.5 percentage points higher in 2018, whereas in France, Germany, and Sweden, the gender unemployment gap was either zero or negative, that is, women had a lower unemployment rate. In terms of institutions, Spain presents a concrete example of inflexible work arrangements and fixed time cost of work for women. This is due to the fact that the organization of the workday is unusual in Spain. Many jobs have long lunch breaks that create split-shift work schedules. Figure 1 shows the fraction of employees at work during different times of the day in Norway, Spain, and the UK. By 6.00 pm, less than 20% of workers are at work in Norway and the UK. In contrast, 50% of them are still at work in Spain. The split-shift schedules make combining work and childcare difficult. Available evidence suggests that women are constrained in their work schedules, and there are no compensating wage differentials for having a split-shift schedule (Amuedo-Dorantes and De la Rica, 2009).

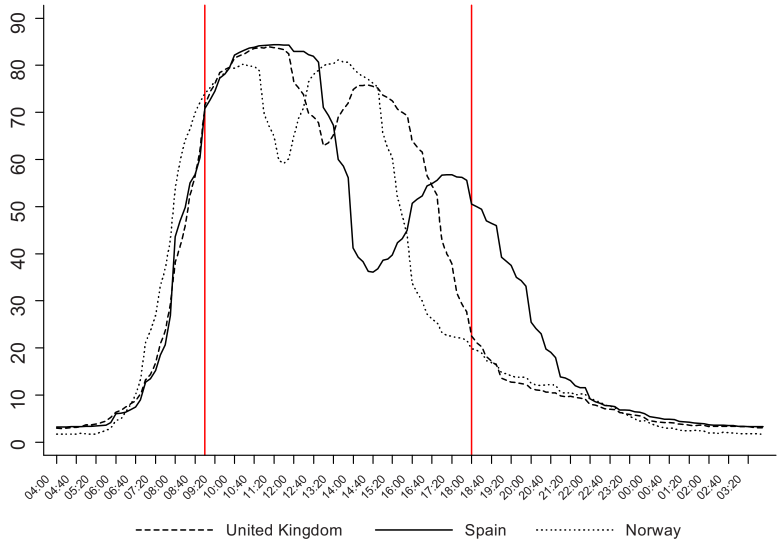
Furthermore, Spain has one of the highest fraction of workers with temporary contracts in Europe. In 2018, about 28% of women worked with a temporary contract. However, the incidence is much higher among the young; 72% of women between 15 and 24 worked with a temporary contract in 2018.[5] The temporary contracts were introduced in 1984. They have

[2] Evidence from surveys and experiments suggests that women have a stronger preference for greater work flexibility and job stability (Mas and Pallais, 2017; Wiswall and Zafar, 2018). Ciasullo and Uccioli (2023) show that regular work schedules are associated with a lower child penalty on women's earnings. Commuting costs also matter significantly for women's labor force participation and the types of jobs they accept (see Petrongolo and Ronchi, 2020, for the UK and Farre et al., 2020, for the US).

[3] Wars, which are marked by heightened economic uncertainty, also lead to the postponement of fertility (Chabé-Ferret and Gobbi, 2018; Vandenbcroucke, 2014). During the last two recessions in the US, fertility started to fall several quarters before economic downturns (Buckles et al., 2020; Coskun and Dalgic, 2024).

[4] See De la Rica and Iza (2005) for Spain, Auer and Danzer (2016) for Germany, Landaud (2021) for France, and Lopes (2019) for Portugal.

[5] See: OECD Labor Force Statistics, https://stats.oecd.org/Index.aspx?DataSetCode=TEMP_I



NOTES: The sample is restricted to 25- to 54-year-old employees who filled the diary on an ordinary working day. The figure shows the fraction who report employment as the main activity (main or second job and activities related to employment) at different hours of the day. The vertical lines mark 9 am and 6 pm.
SOURCE: Harmonized European Time Use Surveys (HETUS) database, www.tus.scb.se (accessed on 8/11/2018).

FIGURE 1

FRACTION OF PEOPLE AT WORK

a much lower firing cost than permanent contracts and can last up to two to four years.[6] In practice, temporary contracts are often much shorter, and the conversion rate of temporary contracts to permanent ones is very low, about 6% per year. As a result, a significant fraction of the labor force faces very uncertain labor market prospects as they move from one temporary job to the next. There is the potential that these institutions can account simultaneously for the lower fertility and the worse female labor market outcomes.

We first use administrative data from the Spanish Social Security Records to study the relationship between temporary contracts and fertility. For women with a college degree, employment with a temporary contract reduces the odds of having a first birth by 28%, whereas for women without a college degree, by 25%. The impact of temporary contracts on fertility accumulates over the life cycle. Women who spend at least 50% of their working life with a temporary contract have fewer children at age 40 and are more likely to be childless, compared to women who spend less than 50% of their working life with a temporary contract. Women with higher exposure to temporary contracts also have lower earnings at age 40. Using data from the Spanish Time Use Survey (STUS), we also show that women with children are less likely to work in jobs with split-shift schedules compared to men or women without children. For college-graduate women, the children reduce the odds of working with a split-shift job by about 57%. The figure for noncollege graduates is about 47%.

Next, we build a life-cycle model in which married women decide whether or not to participate in the labor market, how much to consume, how many children to have, and when to have them. Having a child is costly, both in terms of time and money. Married women are ex-ante heterogeneous along several dimensions. They differ in educational attainment (they can be college graduates or have less than a college degree), their abilities, and their husbands' abilities. There are also two sources of unobserved heterogeneity. First, women differ in their

[6] Workers with permanent contracts are entitled to severance pay of 20 days' wages per year of service (up to a maximum of 12 months' wages) in fair dismissals and 45 days' (up to a maximum of 42 months') wages in unfair dismissals. Firing costs for temporary contracts were introduced in 2001. It was eight days' wages per year of service, but has gradually increased up to 12 days.

preferences for early or late childbearing. Second, they differ in their access to informal childcare, which allows employed mothers to avoid the monetary cost of childcare. Jobs can be temporary or permanent. Temporary jobs have a higher separation rate and are stochastically converted to permanent ones with lower separation rates.

Jobs can also have a regular or split-shift schedule. The fraction of women who work with a split-shift schedule is endogenous since women can choose not to accept such contracts. Women are employed, unemployed, or out of the labor force each period. As women work, they accumulate human capital, which is faster for younger women. But women's ability to have children declines with age, so they face a trade-off between establishing their careers (having more labor market experience and obtaining a permanent contract) and risking not having any children. Husbands do not make any decisions; their employment and wages evolve stochastically and affect household resources. As the life cycle progresses, husbands' labor market status also undergoes exogenous changes, resulting in further diversity among household types.

The model is utilized to measure the impact of labor market uncertainty, inflexibility, and childcare costs on fertility. The underlying heterogeneity and the endogeneity of critical decisions in the model are vital for addressing the question at hand, which would be challenging to answer with a less structural approach. We show that estimates from a reduced form regression would underestimate the effect of temporary contracts on first births due to unobserved heterogeneity in fertility preferences or access to informal childcare. Additionally, the model economy serves as a quantitative laboratory that allows us to unravel the different mechanisms at play. We explore not only fertility but also other margins of adjustment, such as participation, employment, types of contracts, and working schedules.

The model economy is calibrated to match inequality, employment, and fertility outcomes for a particular cohort of women in the data: married women born between 1966 and 1971 who were between 39 and 44 years old in 2010. Model parameters are allowed to differ between women with and without a college degree. Three counterfactual policies are considered. First, we eliminate labor market duality and move to a single-contract economy. In the benchmark economy, 5.5% of college-graduate women with a temporary contract become unemployed each quarter, whereas the rate is only 0.65% for those with a permanent one. For noncollege graduates, the separation rates are 17% and 1.7% with temporary and permanent contracts, respectively. In a single-contract economy, we impose the separation rates of permanent contracts for everyone. Next, we eliminate split-shift schedules, which save about two hours of fixed cost of work for women. Finally, we lower the childcare costs by 35%, which would extend an existing 100-euros-a-month subsidy to working mothers with children below age 3 to all working mothers.

When implemented together, the impact of these reforms on fertility is significant. The number of children at age 44 increases from 1.60 children to 1.96 for college graduates and from 1.58 increases to 1.74 for women without a college degree. The average completed fertility of married women in the new economy is 1.8 children. With these reforms, women's labor force participation increases significantly, and the employment gap between women with and without children disappears. Together with these three reforms, if we also extend single contracts to husbands, there is almost no additional effect on the fertility of college-educated women; completed fertility increases from 1.96 to 1.98. However, for women without a college degree, the completed fertility increases from 1.74 to 1.85 since husbands' economic resources are more critical. The average completed fertility is then 1.87 children.

If we only eliminate labor market duality, the fertility of women with a college degree increases from 1.60 to 1.68. In a single-contract economy, jobs last longer, and women enjoy higher and less risky incomes. There is also no reason to wait to obtain a permanent job first and then have a child. Our results show the rise in fertility is mainly due to higher and less risky incomes. We also find that in a single-contract economy, women wait to obtain regular-schedule jobs. Almost all mothers work with a regular-schedule job, and split-shift jobs disappear endogenously. The results for noncollege women are different. For them, the average fertility declines. In a single contract economy, women's labor force participation increases for both education groups, but the increase is much more substantial for noncollege women (57% to 81%). As a result, although a single contract makes having children more attractive for those already working, fertility declines for those who enter the labor force, and for non-college women, the latter effect dominates. This is not the case for college women since the increase in labor force participation is smaller, from 85% to 94%.

When we only eliminate split-shift schedules, fertility increases to 1.69 children for women with a college degree, a rise similar to the one we obtain in a single-contract economy. For non-college women, fertility does not change. Again for both groups, labor force participation increases. Finally, lower childcare cost alone significantly increases fertility for both groups; fertility rises to 1.86 for college graduates and 1.79 for noncollege women. Childcare subsidies also increase the employment rate of mothers, from 72% to 76%, and mothers with babies (children who are less than two years old), from 70% to 74%.

The article contributes to the structural labor and macro literatures that study the labor force participation and fertility decisions of women.[7] Within this literature, Sommer (2016) emphasizes the importance of income uncertainty (wage shocks). Our focus is on the uncertainty that emerges from labor market transitions. The effect of labor market transitions on fertility was studied by Da Rocha and Fuster (2006), focusing on US–Spain differences in job-finding rates. Another related paper is Lopes (2019), who studies the effects of temporary contracts on fertility in Portugal. We disentangle the role of duality from uncertainty and explore the interactions between dual labor markets and flexibility. She models temporary contracts in greater detail, but her analysis abstracts from labor force participation decisions. Our analysis shows that the entry of women into the labor force is critical to understanding how labor market institutions affect fertility. The effects of childcare costs on female labor supply have been studied, among others, by Attanasio et al. (2008) and Guner et al. (2020) for the US, and by Bick (2016) who studies the impact of childcare subsidy expansions on female labor supply and fertility in Germany.[8]

Our second contribution is introducing labor market flexibility into a life-cycle model of fertility. Del Boca and Sauer (2008) is one of the first papers highlighting the importance of aggregate measures of labor market flexibility and childcare availability for differences in labor force participation and fertility across Italy, Spain, and France. Cortes and Pan (2016, 2019), Erosa et al. (2022), and Cubas et al. (2023) show that a substantial fraction of the observed gender wage gap is due to women's occupational choice and labor supply decision. Flabbi and Moro (2012), who estimate a search model with an explicit role for working hours flexibility, find that women with a college degree value flexibility more than women with only a high school degree. These papers, however, abstract from fertility decisions. Adda et al. (2017) build a model with endogenous fertility and occupational choice to study how children affect the career choices of women in Germany. In their model, females choose between low-wage-growth occupations that are more child-friendly and high-wage-growth occupations that carry a penalty for career breaks. Our focus is on low fertility as a mechanism to cope with inflexibility.

2. FACTS

In this section, we document how temporary contracts and split-shift schedules are related to the fertility decisions of married women in Spain. Our primary data source is the 2005–10 Continuous Sample of Working Lives (Muestra Continua de Vidas Laborales con Datos Fis-

[7] Dynamic models of fertility and labor supply decisions go back to Heckman and Willis (1976) and Heckman and MaCurdy (1980). For recent papers that model joint labor supply and fertility decisions, see, among others, Francesconi (2002), Caucutt et al. (2002), Erosa et al. (2010), Eckstein et al. (2019), and Adda et al. (2017).

[8] Other potential drivers of the low fertility in developed countries have also been considered, such as the allocation of household work between husbands and wives (de Laat and Sevilla-Sanz, 2011; Doepke and Kindermann, 2019; Feyrer et al., 2008), and parental incentives to invest in children's education (Kim et al., 2024).

cales, MCVL). The MCVL is a 4% random sample of individuals registered to the Spanish Social Security during a reference year. Starting from a reference year, for example, 2010, and going back, the MCVL traces the social security records of individuals up to their first employment (or up to 1980 for the older cohorts). At any moment, a working-age individual can have a social security record if she is employed or is receiving unemployment benefits.

The unit of observation in the MCVL is an individual labor market spell, which can be employment with a particular contract (a job spell) or unemployment (an unemployment spell). Each spell is characterized by a start date, an end date, and a firm identifier. For each job spell, the MCVL provides information on part-time or full-time status, sector of employment (public or private), industry, occupation, and type of contract (temporary or permanent). MCVL also includes information on basic personal characteristics such as gender, date of birth (which we use to generate age), and nationality. The MCVL can be matched with the municipality records, which provide additional information, such as education for the reference person, and basic information on other household members, including gender and date of birth. We infer marital status, the number of children, and new births using information on the age and gender of all household members from the municipal records. As such, the sample of individuals, which we refer to as married, includes individuals who are legally married or cohabiting.[9] Based on labor market spells, we construct a quarterly panel. The analysis is restricted to native married women born between 1966Q1 and 1971Q4, who were between 39 and 44 years old in 2010. Further details on the construction of the quarterly panel are provided in Online Appendix A.

Although the MCVL is an excellent data source to capture the relation between temporary contracts and fertility, it also has shortcomings. First, the demographic characteristics of households are obtained by merging the MCVL with the municipal records, and, as a result, information on the number of children is restricted to children at home. Thus, we complement the MCVL with the 2018 Spanish Fertility Survey (FS), which provides detailed information on completed fertility, age at first births, and childcare costs.

In the FS, we can calculate the completed fertility of women in our cohort who are employed at around age 49. College-educated women have 1.60 children (17% are childless, whereas 21% have only one child). The age at first birth is around 32 years, with only 36% of women having a first birth below age 30. How does the level of fertility from the FS compare with the one we obtain in the MCVL? College-educated women in our MCVL sample who are 44 years old and employed have 1.51 children, which is close to the number we calculate from the FS. In contrast, the MCVL does a worse job of capturing the fertility rate of women without a college degree. For noncollege native women in our cohort, the completed fertility of women employed at age 49 is 1.51 in the FS but only 0.94 at age 44 in the MCVL. A possible reason for the gap between the FS and the MCVL for the less educated women is that we do not observe children if they are not coresidents. Since women with less education have children at a younger age, their children are more likely to leave parental home when women are 44 years old. Given this concern on the level of completed fertility, whenever feasible we construct all the targets on completed fertility and age at first birth for the quantitative analysis from the FS.

Second, the MCVL does not provide information on individuals who are out of the labor force. Therefore, we use the Spanish Labor Force Survey (LFS) and its rotating panel component (LFS-flows) to construct stocks of individuals who are employed, unemployed, or out of the labor force, and flows among these labor market states, respectively. For the particular cohort of married women that we study in the MCVL, in the LFS, 19% have at least a college degree, and the rest (81%) do not.

[9] In 2010, 35.5% of births in Spain were to unmarried mothers. But only for 1.9% of births, the father's age is missing in birth records, which can be a more accurate indication of single motherhood. This fraction was slightly higher, 2.7%, in 2018. See Spanish National Statistical Institute (Birth Statistics).

TABLE 1
TEMPORARY CONTRACTS AND THE FIRST BIRTH PROBABILITY

	(1)	(2)	(3)	(4)
College				
Temporary $_{t-4}$	0.633***	0.672***	0.661***	0.723***
	(0.031)	(0.035)	(0.053)	(0.059)
Number of observations	66,286	66,286	37,581	37,581
Noncollege				
Temporary $_{t-4}$	0.700***	0.647***	0.718***	0.750***
	(0.024)	(0.022)	(0.038)	(0.040)
Number of observations	197,513	197,513	106,274	106,274
Personal characteristics	No	Yes	Yes	Yes
Work-related characteristics	No	No	Yes	Yes
Year fixed effects	No	No	No	Yes

NOTE: (i) Reported are the odds ratio with individual-level clustered standard errors in parentheses. (ii) Personal characteristics include age. Work-related characteristics are firm tenure (in quarters), a binary indicator for the public sector, a binary indicator for full-time, occupation dummies (12 social security categories) and NACE one-digit industry dummies (nine categories). All models include a constant term. (iii) $*p < 0.10$, $**p < 0.05$, $***p < 0.01$.

Third, it is not possible to match wives and husbands in the MCVL and construct joint labor market transitions or total household earnings. The LFS does not contain any information on earnings, either. Therefore, we use the European Union Statistics on Income and Living Conditions (EU-SILC) to construct household-level income measures.

Finally, we use the STUS to obtain information on workers with split-shift and regular work schedules. In all data sets, we try to keep the sample as comparable as possible to the one from the MCVL (further details on different data sets used in the analysis and corresponding sample restrictions are provided in Online Appendix A).

Two facts emerge from our data analysis:

1. **Temporary contracts are associated with lower fertility**:

We first look at the relationship between temporary contracts and fertility. In the MCVL sample, a childless college graduate married woman with a permanent contract today has a 3.4% probability of giving birth in a year. The probability is much lower for a woman with a temporary contract, only 2.3%. For women without a college degree, the gap is smaller, 2.7% versus 2.1%. In Table 1, we study whether this unconditional gap is robust to controls by reporting the odds ratio estimates from the following model:

$$(1)\ \Pr(y_{it} = 1 | y_{it-1} = 0, e_{ijt-4} = 1, T_{ijt-4}, \mathbf{x}_{it}, \mathbf{z}_{ijt-4}, \varphi_t) = L(\alpha + \beta T_{ijt-4} + \mathbf{x}_{it}\theta + \mathbf{z}_{ijt-4}\eta + \varphi_t),$$

where L is the standard logistic function and the outcome variable y_{it} takes the value of 1 if woman i has a first birth at a specific quarter t, given that she did not have a (first) child in the previous quarter ($y_{it-1} = 0$) and was employed in firm j ($e_{ijt-4} = 1$) in the preceding year.[10] The coefficient of interest, β, is on the binary indicator of working with a temporary contract in the preceding year T_{ijt-4}. The vector $\mathbf{x}_{it}$ includes other personal characteristics (at quarter t), age in this specification, and the vector $\mathbf{z}_{ijt-4}$ contains work-related characteristics (in the preceding year), such as firm tenure, full-time employment, an indicator for public sector employment, occupation, and industry. In addition to individual and work-related characteristics, the model also controls for year fixed-effects φ_t.

Table 1 shows the odds ratio estimates. Column 1 presents the results where we only control for the temporary contract indicator. In the following three columns, we gradually add personal and work-related characteristics. In the final column, where we control for all covari-

[10] Women drop out of the sample if they have a first child. Otherwise, they are in the sample for the following quarter. Each additional quarter is considered an independent observation, but the standard errors are clustered at the individual level for the possible intragroup correlations.

TABLE 2
FERTILITY AND EARNINGS STATISTICS BY TIME SPENT ON TEMPORARY CONTRACTS, AGED 25–44

	Number of Children			% Childless			Daily Earnings		
	<50%	≥50%	Δ	<50%	≥ 50%	Δ	<50%	≥50%	Δ
College									
Married at age 35	1.01	0.87	0.14***	35.42	40.19	−4.77**	73.89	73.29	0.60
Married at age 40	1.53	1.37	0.16***	19.18	22.06	−2.87	81.61	76.73	4.87**
Married at age 44	1.53	1.27	0.26*	20.00	21.67	−1.67	86.12	74.74	11.39**
Noncollege									
Married at age 35	1.02	0.99	0.03	31.60	34.33	−2.73**	51.99	46.42	5.56***
Married at age 40	1.22	1.08	0.14***	25.33	29.58	−4.24***	55.48	50.22	5.26***

NOTES: (i) We further restrict our sample of women to those who were employed at least 50% of the time between 1996Q1 and 2010Q4. (ii) Within each panel Δ denotes the difference between columns <50% and ≥ 50%. (iii) ***, **, and * indicate that the difference is statistically significant at the 0.01, 0.05 and 0.10 level, respectively.

ates together with year fixed-effects, the odds of having a (first) child is 28% less for childless college-graduate women who are employed with a temporary contract than for childless women who are employed with a permanent contract. The impact on noncollege women is smaller, having a temporary contract reduces the odds of a first birth by 25%.

Table 1 shows that women with temporary contracts are less likely to have children at a point in time. These women might still reach the same completed fertility as those with a permanent contract but have their children later. In Table 2, we show that this is not the case, by splitting the sample of women into two groups: those who spent less than 50% of their working life with a temporary contract between ages 25 and 44 and those who spent 50% or more. We then compare the number of children these women have at different ages. For each outcome in Table 2, we also report the gap between those with higher and lower exposure to temporary contracts (indicated by Δ) and whether these gaps significantly differ from zero.

A college-graduate woman who worked in a temporary contract for 50% or more of her employed life has about 1.27 kids by age 44. The number of children is higher, about 1.53, for women who spend less time on temporary contracts. The difference between these two groups opens up early; at age 35, there is a difference of about 0.14 children, and the gap increases as they age. Women who spend a larger fraction of their working life with temporary contracts are also more likely to be childless at age 44. As we have pointed out above, the MCVL does a poor job of capturing fertility levels at older ages, particularly for women without a college degree. Thus, in Table 2, we only report outcomes for those aged 35 and 40. Although the fertility level at age 40 is low, the gaps between those who spend more or less than 50% of their working life with temporary contracts follow the same pattern. Women with more extended exposure to temporary contracts have fewer children at ages 35 and 40 and are more likely to be childless.

Table 2 also reports the impact of extended exposure to temporary contracts on earnings at different ages. At age 40, college women who spend 50% or more of their working life with temporary contracts earn about 5 euros less per day than those whose exposure was less than 50%; this is about 6% of the earnings of women with higher exposure to temporary contracts.[11] The gap is close to 15% at age 44. For noncollege women, the gap is also significant, about 10.5% at age 44. On the one hand, these earnings differences might reflect differential returns to experience accumulated with temporary and permanent contracts, as documented by Garcia-Louzao et al. (2023). On the other hand, the gap might also reflect a larger destruction rate for temporary contracts, which results in more frequent spells of unemployment and human capital depreciation.

[11] The MCVL data do not contain information on hours worked to construct hourly wages.

In Tables B1 and B2 in Online Appendix B, we document the impact of temporary contracts on fertility for men.[12] We find that temporary contracts also reduce the odds of having a first child for men, and these effects accumulate over the life cycle. Since the probability of working with a temporary contract within a household is likely to be correlated, the results in Tables 1 and 2 for wives and the ones for husbands in the Online Appendix capture, to a certain extent, the combined effect of one or more members in a household working with a temporary contract.

2. **Mothers are less likely to work in split-shift schedule jobs**:

Next, we document the relationship between split-shift schedule jobs and fertility. In the STUS 2009–10, about 28.36% of all employed women aged 25 to 44 worked with a split-shift schedule. For employed mothers (nonmothers), the fraction is smaller (larger), about 25.15% (42.05%), and is quite similar for those with and without a college degree, 25.80% (43.53%) and 24.76% (40.91%), respectively. This difference can reflect the extra cost split-shift schedules entail for women with children. In order to assess this cost, we calculate the time interval between the first and last times a female worker indicates that she works in a day. This interval is 6.68 hours with a regular contract and 8.69 hours with a split-shift job, representing a potential fixed cost of two hours.

What are the origins of split-shift schedules? One potential factor was Franco's decision to adopt Central European Time in 1942 to align Spanish time with Germany. Lunch and dinner times were adjusted to follow the actual sun time and shift an hour. Another factor was the scarcity of jobs after the Civil War. Many men had to work two jobs (one before lunch from 8 am to 2 pm, the other after lunch from 4 pm to 8 pm) to be able to bring enough income to the household (Vilar-Rodríguez, 2006). Despite attempts by different governments to align Spanish working hours with the rest of Europe, such schedules persist due to coordination failures, as it is costly for individual companies to adopt a regular work schedule. As such, split-shift schedules are prevalent across different industries, occupations, and regions (see Table B3 in Online Appendix B).

There is a negative correlation between the fraction of women working with split-shift schedules and the completed fertility across occupations and regions (see Figure B5 in Online Appendix B). In order to investigate the relationship between motherhood and the probability of working with a split-shift schedule further, we once again run a logistic regression

$$\Pr(y_i = 1 | , F_i, P_i, F_iP_i, \mathbf{x}_i, I_i, \mathbf{z}_i) = L(\alpha + \beta F_i + \gamma P_i + \delta F_iP_i + \mathbf{x}_i\theta + \lambda I_i + \mathbf{z}_i\eta), \tag{2}$$

where outcome variable y_i takes the value of 1 if individual i works with a split-shift schedule and 0 otherwise. The set of predictors includes a binary gender indicator (F_i), a binary indicator for the presence of own children in the household (P_i), and the interaction between them (F_iP_i). The vector $\mathbf{x}_i$ includes personal characteristics, such as age and region, and I_i is the household income. The vector $\mathbf{z}_i$ contains work-related characteristics, such as full-time employment, temporary contract, occupation, and industry, as well as indicators for having a second job and whether the respondent states to have flexible working hours.

In Table 3, column 1 shows the odds ratio estimates when we only include a gender indicator. In column 2, we only control for an indicator for the presence of own children in the household (i.e., being a parent). In column 3, we control for both gender and the presence of children and their interaction. The results show that children affect men and women differently. Although we do not observe a significant difference between childless men and women in the odds of working with a split-shift job, children have a significant negative impact on females but not on males. The odds of working with a split-shift schedule is 57% less for college-graduate mothers than for men and women without children. As we move across

[12] Since it is not possible to match husbands and wives in the MCVL, we reproduce Tables 1 and 2 for married men two years older than married women in the cohort we study (who would be the potential husbands). The median age difference between husbands and wives is about two years for this sample of women in the LFS .

TABLE 3
MOTHERHOOD AND THE PROBABILITY OF WORKING WITH A SPLIT-SHIFT SCHEDULE

	(1)	(2)	(3)	(4)	(5)	(6)
Men and College Women						
Female	0.446***	-	0.843	0.746	0.806	1.097
	(0.060)		(0.236)	(0.214)	(0.234)	(0.363)
Parent	-	0.818	1.017	1.182	1.163	1.181
		(0.120)	(0.181)	(0.219)	(0.217)	(0.235)
Female × Parent	-	-	0.431***	0.453**	0.457**	0.428**
			(0.139)	(0.149)	(0.150)	(0.152)
Number of observations	1,174	1,174	1,174	1,174	1,174	1,174
Men and Noncollege Women						
Female	0.407***	-	0.765	0.736	0.726	1.046
	(0.049)		(0.204)	(0.200)	(0.198)	(0.315)
Parent	-	0.763*	1.017	1.130	1.121	1.141
		(0.108)	(0.181)	(0.208)	(0.207)	(0.226)
Female × Parent	-	-	0.459***	0.464**	0.471**	0.531*
			(0.137)	(0.141)	(0.143)	(0.176)
Number of observations	1,355	1,355	1,355	1,355	1,355	1,355
Personal characteristics	No	No	No	Yes	Yes	Yes
Household income	No	No	No	No	Yes	Yes
Work-related characteristics	No	No	No	No	No	Yes

NOTES: (i) Reported are odds ratios with robust standard errors in parentheses. (ii) Personal characteristics include age and regional dummies (seven categories). Household income is net average monthly household income (four categories <1200 euros, between 1201 and 2000 euros, between 2001 and 3000 euros, and >3000 euros). Work-related characteristics include a binary indicator for full-time employment, National Classification of Occupations (CNO) one-digit occupation dummies (regrouped, five categories), National Classification of Economic Activities (CNAE) onedigit industry dummies (regrouped, nine categories), a binary indicator for having a second job, a binary indicator for having flexible working hours, and a binary indicator for having a temporary contract. All models include a constant term. (iii) $*p < 0.10$, $**p < 0.05$, $***p < 0.01$.

columns from left to right, we gradually add personal characteristics, household income, and work-related characteristics, and the odds ratio remains significant and similar in magnitude. The results are very similar for noncollege mothers, based on the estimates in column 6, the odds of working with a split-shift schedule is 47% less for them compared to men and women without children.

3. MODEL

We next build a life-cycle model where married females make labor force participation, fertility, and savings decisions. The model economy is populated by married households. Each married household consists of two potential earners, a male (m) and a female (f). Individuals are born married and do not experience marital transitions. Husbands and wives age together. The wives differ in their education and they can be with or without a college degree. To save on notation, we omit any indicator for educational attainment. Individuals, men or women, also differ by their abilities, denoted by a. The abilities of a couple come from a joint distribution, $F(a_f, a_m)$, at the start of life and remain constant afterward. Beyond education and innate ability, the model has two sources of unobserved heterogeneity. First, females differ in their preferences for having children earlier or later in life. Second, couples differ in their access to informal care, which affects the monetary cost of having children.

Demographics: A model period is a quarter. We focus on the behavior of women between ages 25 ($j = 1$) and 54 ($J = 54 \times 4$). Fertility decisions are uncertain; even if a woman wants to have a child, she may not get pregnant. Fertility opportunities decrease with a woman's age, and α_j denotes the probability that an age j female gets pregnant, conditional on her decision to have a baby.

Once children are born, they age stochastically. There are three age groups for children: less than 2 years old (babies), between 3 and 14 (school-age), and 15 or older (young adults). Each period a baby becomes a school-aged child with probability $\delta_b = 1/8$. After age 3, school-age children face a probability δ_c of becoming a young adult each period. We set $\delta_c = 1/52$, so on average school-age years last 13 years, and young adulthood starts at age 15.

Keeping track of the distribution of children across ages would be computationally very costly. In order to capture costs and benefits of children in a minimally realistic way, we make assumptions so that the total number of children and their age group are sufficient to define a household's demographics, denoted by (n, i) for $n \in \{0, 1, 2, \ldots\}$ and $i \in \{1, 2, 3\}$, respectively. To this end, we first assume that as long as a female has a baby at home, she cannot have another one. Second, when a new baby arrives, all existing children (school-age or young adults) become babies. These assumptions imply that in a household, there can be only babies, only children, or only young adults at a point in time.

Let $b \in \{0, 1\}$ indicate whether or not a household decides to have a baby. Then, for a household of age j, the number of children and their age groups evolve as follows:

$$(3) \qquad (n', i') = \begin{cases} (n, 2) \text{ with prob. } \delta_b \text{ if } i = 1 \\ (n, 1) \text{ with prob. } (1 - \delta_b) \text{ if } i = 1 \\ (n + 1, 1) \text{ with prob. } \alpha_j \text{ if } i \neq 1 \text{ and } b = 1 \\ (n, 3) \text{ with prob. } [b(1 - \alpha_j) + 1 - b]\delta_c \text{ if } i = 2 \text{ and } b = 0, 1 \\ (n, 2) \text{ with prob. } [b(1 - \alpha_j) + 1 - b](1 - \delta_c) \text{ if } i = 2 \text{ and } b = 0, 1 \\ (n, 3) \text{ with prob. } [b(1 - \alpha_j) + 1 - b] \text{ if } i = 3 \text{ and } b = 0, 1 \end{cases}.$$

The first two lines in Equation (3) indicate a situation when a household already has a baby ($i = 1$), so they cannot have a new one, and the ones at home age stochastically to become school-age children. The next is the case when the household can have a baby ($i \neq 1$) and decides to have one. With probability α_j, the couple has a new baby, so the total number of babies in the household is $n + 1$ since all the children at home become babies. The following two lines show the situation when the family has school-age children ($i = 2$). If they decide to have a new baby ($b = 1$) but are not successful (with probability $1 - \alpha_j$) or they do not try to have a new baby ($b = 0$), the school-age children age stochastically and become young adults. Finally, if $i = 3$, number of children and their age do not change as long as the household does not or cannot have a new baby. Below, when we define the value function for household decisions, we represent Equation (3) by $\Gamma_j(n', i' | n, i, b)$.

Preferences: Each period, a married female decides whether or not to work, how much to consume, how much to save, and, if feasible, whether or not to have another child. Each female has one unit of time endowment each period. Her preferences are given by

$$(4) \qquad u(c, n, i, \ell, j) = \log\left(\frac{c}{\Omega(n, i)}\right) + \gamma_1 \frac{exp(j - \gamma_3)}{1 + exp(j - \gamma_3)}(\overline{n} + n)^{\gamma_2} + \chi \log(\ell),$$

where c is consumption, $\Omega(n, i)$ is the household equivalence scale, and ℓ is leisure. In this formulation, $\overline{n}$ denotes an exogenously given number of children from which parents get utility, independent of the number of children they have. This is a rather standard feature that allows us to pin down the fraction of childless females. The parameters γ_1 and γ_2 affect the average number of children and the income–fertility gradient, whereas χ is the relative weight on leisure.

We also assume that the utility that parents get from children is increasing in parents' age, given by $\frac{exp(j-\gamma_3)}{1+exp(j-\gamma_3)}$. This term captures other factors that might push parents to delay their fertility, such as housing or other high fixed-cost investments for households. Females are heterogeneous in γ_3, and a lower value for γ_3 implies a stronger preferences to have children early in the life cycle.

Labor Market—Females: A married woman can be in one of three labor market states: *employed, unemployed, or out-of-labor force*. We assume that all jobs are full-time and imply a time cost of l. Each period, with probability ϕ, an unemployed female receives a job offer. If she accepts the offer, she starts working next period. If she rejects the offer, she decides whether to continue to be unemployed or move out of the labor force. Only unemployed workers can get job offers. They have to incur, however, a participation cost in terms of leisure, denoted by ξ. Females who are out of the labor force do not incur this cost, but do not receive job offers. In order to receive job offers, a female, who is out of the labor force, has to enter first the labor force as unemployed.

There are two types of jobs: temporary and permanent, denoted by indicator $P = 0$ and $P = 1$, respectively. Jobs also differ by the type of work schedule they offer. They can have a split-shift or a regular work schedule, denoted by indicator $S = 1$ and $S = 0$, respectively. Split contracts have a fixed time cost denoted by κ. As a result, the total working hours for a split-shift job is $l + \kappa$, while the worker only receives a wage for l hours. We assume that a fraction ψ of all new job offers (temporary or permanent) have a split-shift schedule. All new jobs start as temporary. A female with a temporary contract is promoted to a permanent job with probability π and stays with the temporary with $1- \pi$. Each period, jobs can be destroyed with probability δ_P. Temporary contracts have a higher probability of being destroyed, that is, $\delta_0 > \delta_1$, so they last shorter.

Females accumulate human capital, h, as they work. Each female starts her life with $h = 1$, and if she works in age j, then her next period human capital is given by

$$\ln(h') = \ln h + \ln(1 + \eta_1^P + \eta_2^P j). \tag{5}$$

Each extra quarter of work on a job is associated with a η_1^P percent growth in wages. The growth rate, however, declines with age if $\eta_2^P < 0$. Returns to experience can differ between temporary ($P = 0$) and permanent jobs ($P = 1$). If a woman is unemployed or out of the labor force, her human capital depreciates at rate δ_h.

The earnings of a female depend on her ability, human capital, and contract type, and is given by

$$w_f(a, h, P) = \zeta_P a h, \tag{6}$$

where $\zeta_1 = 1$, and $\zeta_0 < 1$ is the earnings penalty for temporary contracts.[13]

Child Care Costs: Each period, a working female with babies or school-age children pays childcare costs, denoted by d_1 and d_2.[14] We assume that childcare costs are independent of the number of children in the household. We also assume that not all households pay childcare costs. A household can have access to informal childcare (e.g., grandparents), denoted by

[13] Note that gender differences in the mean abilities of men (a_m) and women (a_f) are isomorphic to a direct gender penalty, $\zeta_f < 1$, in $w_f(a, h, P) = \zeta_f \zeta_P a h$.

[14] We do not model maternity leave. In Spain, mothers have 16 weeks of maternity leave (see: https://ec.europa.eu/social/main.jsp?catId=1129&langId=en&intPageId=4789). This is little more than a quarter, the model period. We could allow women to keep their current jobs and income without any extra childcare payments for one model period. This would create another state variable, whether a woman is on leave or not, and the effects are likely to be small.

$g \in \{0, 1\}$. If $g = 1$, a household has access to grandparents (or other relatives) and does not pay any childcare cost. We assume that $g = 1$ for a fraction φ of all households.

The childcare costs also depend on whether a female works with a split-shift or regular contract and are given by

$$D(i, g, l, S) = \begin{cases} \left(1 + \frac{\kappa S}{l}\right)[d_1 \mathcal{J}(i = 1) + d_2 \mathcal{J}(i = 2)] \text{ if } g = 0 \\ 0, \text{ if } g = 1 \end{cases}, \tag{7}$$

where $\mathcal{J}(x)$ is an indicator function with $\mathcal{J}(x) = 1$ if x is true, and $\mathcal{J}(x) = 0$, otherwise. If a household has access to informal care, then they do not incur any childcare costs. Otherwise, they pay d_1 if they have babies and d_2 if they have children. If the mother works with a split-shift schedule job, that is, $S = 1$, then her childcare costs increase by κ/l, the fixed time cost of split-shift schedule job. Besides monetary costs, babies (zero- to two-year-old children) also imply a fixed time cost for their mothers, denoted by ι.[15] Young adults do not imply any direct monetary or time cost for parents.

The parsimonious stochastic structure for children's ages allows us to capture two key aspects of fertility decisions. First, parents will choose to have their first babies early or late. Fertility timing will depend on household income, childcare costs, and, as we detail below, parents' preferences. Second, having another baby implies incurring childcare costs for a more extended period, as all children in a household become babies. Again, childcare costs and household income will determine the distribution of the number of children across households in the economy.

Labor Market—Males: All males are in the labor force. They do not make any decisions and their labor market status changes exogenously. Males can be in three different labor market states: employed with a temporary contract, employed with a permanent contract, or unemployed. Let $\lambda_m \in \{0, 1, u\}$ denote these labor market states, and $\pi_j^m(x, x')$, for $x, x' \in \{0, 1, u\}$, be the associated transition probabilities from employment state x to x' at a given age j.

Earnings for an employed male of age j depend on his ability and type of contract, and are given by

$$w_m(a, j, P) = a \exp(\omega_0^P + \omega_1^P j + \omega_2^P j^2). \tag{8}$$

Note that as a husband moves between a temporary and permanent contract, his earnings change stochastically as well.

Government: There is a government that taxes individuals and uses the tax revenue to provide means-tested transfers, unemployment benefits, and to finance government consumption. Let $G(I)$ denote any means-tested transfers from the government to the household where I is the total household income. Let $T(I)$ be the taxes that an individual with income level I pays. We assume that unemployed individuals get a $\theta \in (0, 1)$ fraction of average household income in the economy as unemployment benefits.

3.1. *Household Problems.* In order to define the household problem in a recursive formulation, let $\boldsymbol{s} = (a_f, a_m, g)$ be the permanent characteristics of a household.

[15] Although fathers' income helps the household to cope with the monetary cost of children, fathers do not share the time cost of children in the model. Childcare time by fathers is very small in Spain (de Laat and Sevilla-Sanz, 2011).

3.1.1. *Value function of employed.* Suppose the wife has a type-(P, S) job, her human capital level is h, the labor market status of her husband is λ_m, and household assets are given by k. Then, the problem of an employed age j female with n, age i children is given by

$$V_j^e(\boldsymbol{s}, k, n, i, P, S, h, \lambda_m) = \max_{c,k',b} u(c, n, i, \ell, j) \\ +\beta(1-\delta_P)\mathbb{E}W_{j+1}^o(\boldsymbol{s}, k', n', i', P', S, h', \lambda_m' | P, \lambda_m, n, i, b) \\ +\beta\delta_P \mathbb{E}W_{j+1}^{no}(\boldsymbol{s}, k', n', i', h', \lambda_m' | \lambda_m, n, i, b),$$

subject to

$$c + k' + D(i, g, l, S)\mathcal{J}(n > 0) = I_m + I_f + k(1+r) + G(I) - T(I_f + \frac{kr}{2}) \\ - T(I_m + \frac{kr}{2}), \text{ with } k' > 0,$$

$$\ln(h') = \ln h + \ln(1 + \eta_1^P + \eta_2^P j),$$

where

$$\ell = 1 - l - \iota\mathcal{J}(i = 1) - \kappa S,$$

and

$$I_m = \begin{cases} w_m(a, j, \lambda_m) \text{ if } \lambda_m \in \{0, 1\} \\ \theta_m \bar{I} \text{ if } \lambda_m = u. \end{cases}, \ I_f = \zeta_P a h,$$

where $\bar{I}$ is the average labor income in the economy and $\theta_m \bar{I}$ is the unemployment payment for an unemployed husband. As it will become clear below, the expectations in $\mathbb{E}W_{j+1}^o$ are defined over $(n', i', P', h', \lambda_m')$ and for $\mathbb{E}W_{j+1}^{no}$ over (n', i', h', λ_m'). Recall that temporary and permanent jobs are denoted by indicator $P = 0$ and $P = 1$, respectively.

A female has earnings given by $\zeta_P ah$, which are increasing in her human capital. Recall that $\zeta_1 = 1$, and $\zeta_0 < 1$ is the earnings penalty for temporary contracts. Given her husband's earnings (I_m), which depend on whether he is employed or unemployed, a married female decides how much to consume (c), how much to save (k'), and whether to have a baby (b). She enjoys $\ell = 1 - l - \iota\mathcal{J}(i = 1) - \kappa S$ units of leisure, which reflects the time cost of work (l), childcare time for babies (ι), and the fixed cost of work associated with split-shift jobs (κ). Household income net of taxes and transfers is used for consumption savings and childcare expenses.

If an employed female does not lose her job, which happens with probability $1 - \delta_P$, then the expected value of having the opportunity to work next period is given by

$$\mathbb{E}W_{j+1}^o(\boldsymbol{s}, k', n', i', P', S, h', \lambda_m' | P, \lambda_m, n, i, b) \\ = \sum_{\lambda_m'} \sum_{P'} \sum_{n',i'} \max\{V_{j+1}^e(\boldsymbol{s}, k', n', i', P', S, h', \lambda_m'), V_{j+1}^u(\boldsymbol{s}, k', n', i', h', \lambda_m'), V_{j+1}^{np}(\boldsymbol{s}, k', n', i', h', \lambda_m')\} \\ \times \pi_j^m(\lambda_m, \lambda_m') \times \pi_{P,P'} \times \Gamma_j(n', i' | n, i, b),$$

where $\pi_j^m(\lambda_m, \lambda_m')$ is the exogenous transition probabilities on husband's labor market status, $\pi_{P,P'}$ is probability of moving from type P to type P' contract, and $\Gamma_j(n', i' | n, i, b)$ are the transition probabilities for fertility, defined in Equation (3). The transition probability $\pi_{P,P'}$ takes a simple form with $\pi_{0,1} = \pi$, $\pi_{0,0} = 1 - \pi$, $\pi_{1,1} = 1$, and $\pi_{1,0} = 0$. In this expression, $\mathbb{E}$ represents expectations over (n', i', P', λ'_m) conditional on (P, λ_m, n, i, b). We do not indicate this explicitly here or in the following expressions for brevity of exposition.

Similarly, $\mathbb{E}W^{no}_{j+1}$ is the expected value for a woman who does not have an offer, and hence decides whether to search (be unemployed) or move out of labor market and reads as

$$\begin{aligned}
&\mathbb{E}W^{no}_{j+1}(\boldsymbol{s}, k', n', i', h', \lambda'_m|\lambda_m, n, i, b) \\
&= \sum_{\lambda'_m}\sum_{n',i'} \max\{V^u_{j+1}(\boldsymbol{s}, k', n', i', h', \lambda'_m), V^{np}_{j+1}(\boldsymbol{s}, k', n', i', h', \lambda'_m)\} \\
&\times \pi^m_j(\lambda_m, \lambda'_m) \times \Gamma_j(n', i'|n, i, b).
\end{aligned}$$

To save on computational time, we set $V^e_{J+1}(\boldsymbol{s}, k, n, i, P, S, h, \lambda_m)$, the end-of-life value functions as follows: We assume that both the husband and the wife keep their last period's (period $J's$) labor market income for 10 more years (i.e., from ages 55 to 64), at age 65 they retire, and live for 10 more periods. During retirement, they only have asset income. After age 54, they get utility from the number of children they had at age 54 until age 75, but do not incur any cost associated to children (in terms of time, childcare costs, or consumption congestion). Hence, after age 54, households solve a simple consumption savings problem with a constant labor income for 10 years, and no labor income for another 10.[16]

3.1.2. *Value function of unemployed.* An unemployed woman receives unemployment benefits, which are a fraction θ_f of the average household income in the economy $(\bar{I})$. The household income is then given by the sum of $\theta_f \bar{I}$ and the earnings of the husband. Like a woman who is employed, an unemployed woman decides how much to consume, how much to save and whether to have a new baby. In contrast to a working woman, her human capital depreciates, that is, $h' = (1 - \delta_h)h$. Her problem is given by

$$\begin{aligned}
&V^u_j(\mathbf{s}, k, n, i, h, \lambda_m) \\
&= \max_{c,k',b} u(c, n, i, 1 - \xi - \iota\mathcal{J}(i = 1), j) + \beta\phi\mathbb{E}W^o_{j+1}(\boldsymbol{s}, k', n', i', P' = 0, S', h', \lambda'_m|\lambda_m, n, i, b) \\
&\beta(1 - \phi)\mathbb{E}W^{no}_{j+1}(\boldsymbol{s}, k', n', i', h', \lambda'_m|\lambda_m, n, i, b)
\end{aligned}$$

subject to

$$c + k' = I_m + I_f + k(1 + r) + G(I) - T(I_f + \frac{kr}{2}) - T(I_m + \frac{kr}{2}), \text{ with } k' > 0,$$

where

$$I_f = \theta_f \bar{I} \text{ and } I_m = \begin{cases} w_m(a, j, \lambda_m) \text{ if } \lambda_m \in \{0, 1\} \\ \theta_m \bar{I} \text{ if } \lambda_m = u \end{cases}.$$

If she has an opportunity to work, $W^o_{j+1}(\boldsymbol{s}, k', n', i', P' = 0, S', h', \lambda'_m|\lambda_m, n, i, b)$ captures the expectations over an unconditional distribution over S' (whether her new job has a split-shift or regular schedule) as well as children:

$$\begin{aligned}
&\mathbb{E}W^o_{j+1}(\boldsymbol{s}, k', n', i', P' = 0, S', h', \lambda'_m|\lambda_m, n, i, b) \\
&= \sum_{\lambda'_m}\sum_{S'}\sum_{n',i'} \max\{V^e_{j+1}(\boldsymbol{s}, k', n', i', 0, S', h', \lambda'_m), V^u_{j+1}(\boldsymbol{s}, k', n', i', h', \lambda'_m), V^{np}_{j+1}(\boldsymbol{s}, k', n', i', h', \lambda'_m)\}
\end{aligned}$$

[16] This approach is common in structural model of life-cycle decisions, see, for example, Eckstein et al. (2019).

$$\times \pi_j^m(\lambda_m, \lambda_m') \times \Phi(S') \times \Gamma_j(n', i'|n, i, b),$$

where again $\pi_j^m(\lambda_m, \lambda_m')$ is the exogenous transition probabilities on husband's labor market status, and $\Gamma_j(n', i'|n, i, b)$ are the transition probabilities for fertility. Here, $\Phi(S')$ is the distribution of temporary jobs with respect to the work schedules. Note that all new jobs start as temporary ($P = 0$).

Similarly, if a female does not have a job offer, her expected value for the next period is given by

$$\mathbb{E}W_{j+1}^{no}(\boldsymbol{s}, k', n', i', h', \lambda_m'|\lambda_m, n, i, b) = \sum_{\lambda_m'} \sum_{n', i'} \max\{V_{j+1}^{u}(\boldsymbol{s}, k', n', i', h', \lambda_m'), V_{j+1}^{np}(\boldsymbol{s}, k', n', i', h', \lambda_m')\} \times \pi_j^m(\lambda_m, \lambda_m') \times \Gamma_j(n', i'|n, i, b).$$

3.1.3. *Value function of nonparticipants.* Finally, the problem of a j-year-old female who is out of labor force is given by

$$V_j^{np}(\boldsymbol{s}, k, n, i, h, \lambda_m) = \max_{c, k', b} u(c, n, i, 1 - \iota \mathcal{J}(i = 1), j) + \beta \mathbb{E}W_{j+1}^{no}(\boldsymbol{s}, k', n', i', h', \lambda_m'|\lambda_m, n, i, b)$$

subject to

$$c + k' = I_m + I_f + k(1 + r) + G(I) - T(I_f + \frac{kr}{2}) - T(I_m + \frac{kr}{2}), \text{ with } k' > 0,$$

$$I_f = 0 \text{ and } I_m = \begin{cases} w_m(a, j, \lambda_m) \text{ if } \lambda_m \in \{0, 1\} \\ \theta_m \bar{I} \text{ if } \lambda_m = u \end{cases},$$

and

$$\mathbb{E}W_{j+1}^{no}(\boldsymbol{s}, k', n', i', h', \lambda_m'|\lambda_m, n, i, b) = \sum_{\lambda_m'} \sum_{n', i'} \max\{V_{j+1}^{u}(\boldsymbol{s}, k', n', i', h', \lambda_m'), V_{j+1}^{np}(\boldsymbol{s}, k', n', i', h', \lambda_m')\} \times \pi_j^m(\lambda_m, \lambda_m') \times \Gamma_j(n', i'|n, i, b),$$

where again $h' = (1 - \delta_h)h$ due to human capital depreciation.

4. THE BENCHMARK ECONOMY

We solve the model economy for two groups of married women, those with and without a college degree. Among the cohort of married women that we focus on in this article, 19% have a college degree, and the remaining 81% are noncollege (Table B5 in Online Appendix B). This section presents the calibration strategy for women with a college degree, with details delegated to Online Appendix C. The calibration for women without a college degree, which follows similar steps, is provided in Online Appendix D. The calibration proceeds in two steps. First, we set several parameters to their data counterparts or choose them based on a priori information. In the second stage, we calibrate the remaining parameters to match a set of targets.

4.1. *Parameters Chosen A Priori.* The parameters that are chosen without simulating the model are listed in Table 4. In recent decades, the average long-term real interest rates in

TABLE 4
PARAMETER VALUES (BASED ON A PRIORI INFORMATION)

Description	Parameter Values	Comments
Time on regular contracts	$l = 0.4$	Standard
Interest rate (annual)	$r = 0.8\%$	OECD, Bank of Spain
Fecundity	α_j	Sommer (2016)
Life-span, babies	$\delta_b = 1/8$	Two years (eight quarters)
Life-span, children	$\delta_c = 1/52$	13 years (52 quarters)
Adult Equivalence Scale	$\Omega(n, i) = 1 + 0.5 + 0.3n\mathcal{J}(i \neq 3)$	OECD Modified Scale
Male wage profiles	$\omega_0^P, \omega_1^P, \omega_2^P$	Figure 2
Male employment transitions	$\pi_j^m(\lambda_m, \lambda_m')$	Figure 2
Unemployment benefits	$\theta_f = 0.058, \theta_m = 0.095$	The EU-SILC
Transfers	$g_0 = 0.051, g_1 = 0.031, g_2 = -0.01$	The EU-SILC
Taxes	$\tau_0 = 0.904, \tau_1 = 0.134, \widetilde{I} = 0.47\overline{I}$	García-Miralles et al. (2019)

NOTES: This table reports the parameters that are determined based on a priori information, without simulating the model.

Spain were around 1.6%, whereas the average real deposit rates were close to zero. We set $r = 0.8\%$ as an intermediate value. We adopt the modified OECD household equivalence scale and set $\Omega(n, i) = 1 + 0.5 + 0.3n\mathcal{J}(i \neq 3)$, that is, the second adult counts 50% of the first adult whereas each baby or school-age child counts as 30% of the first adult. The average time cost of a regular (nonsplit) contract, l, is set to 0.4. We take α_j values, which determine the probability that an age j woman might get pregnant upon trying, from Sommer (2016, Figure 1).[17] These parameters are identical for college and noncollege women.

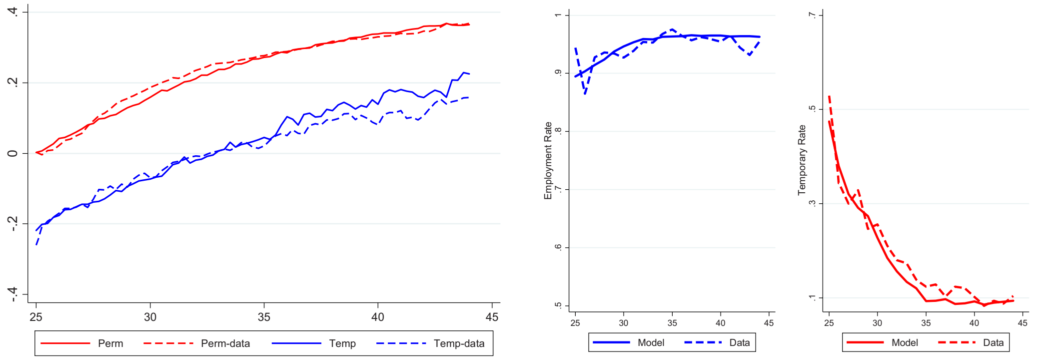
Next, we select the parameters of the earnings process for husbands—Equation (8). To this end, we construct age-earnings profiles for an average husband who is married to a college-educated woman. To do so, we use the earnings information from the MCVL and the education distribution of couples from the LFS.[18] Recall that married women in the data are natives born between 1966 and 1971. In the LFS sample, 49% of college-educated women in this cohort are married to a college-educated husband, and 51% are married to a non–college-educated one (Table B5 in Online Appendix B). Married men are, on average, two years older than their wives. So, we use age-earnings profiles of native, married men born between 1964 and 1969, weighting the profiles for non–college-educated and college-educated by fractions of college-graduate women married to husbands with each education level. Figure 2 (left panel) shows the resulting log-earnings for husbands with temporary and permanent contracts. There is about a 20% earnings gap between permanent and temporary jobs, which is fairly stable along the life cycle.[19] A similar procedure is used to create the labor market outcomes along the life cycle for an average husband—Figure 2 (right panel). Around 90% of men are employed at the start of the life cycle, which increases quickly to 95% by age 30. Around half of those employed work for a temporary contract at age 25. The share declines quickly for older ages, and is around 10% after age 35.

In the model, when males enter the labor market at age 27 (when their wives are at age 25), there is an initial distribution across different labor market states. This initial distribution and the subsequent transitions between nonemployment, temporary, and permanent contracts, $\pi_j^m(\lambda_m, \lambda_m')$, are chosen to match the labor market outcomes along the life cycle (the right-hand panel in Figure 2). Labor market transitions, together with parameters ω_0^P, ω_1^P,

[17] Probability of not being able to conceive is 8% at age 20, increases slowly to 23% by age 30, and then rapidly to 57.5% at age 40 and 95% at age 45.

[18] The main reason to do this is that the earnings information is from the social security records (MCVL), where we cannot match couples. We use LFS data on couples' educational distribution to construct these profiles.

[19] In the simulations, earnings for a husband with a permanent contract married to a college woman of age 25 is normalized to 1 (or 0 in logs). As a result, we also transform the data by normalizing them by the earnings of a husband married to a college woman with a permanent contract at age 27 (her wife would be 25 years old).



NOTES: Right panel sample includes husbands of 25- to 44-year-olds, native, married women with at least a college education born between 1966 and 1971 (from the LFS, 1987–2010). The left panel is based on authors' calculation from the sample of 1964–69 born, native, and married men (from MCVL 2005–10) weighted by the couple's education distribution (from the LFS, 1987–2010). The horizontal axis indicates the age of wives, who are two years younger than their husbands.

FIGURE 2

AGE–EARNINGS PROFILES (LEFT) AND LABOR MARKET OUTCOMES (RIGHT), MALES, MODEL VS. DATA

and ω_2^P, determine the age-earnings profiles (the left-hand panel in Figure 2). In order to reduce the number of parameters, we assume that transitions are the same for three broad age groups, 25–34, 35–44, and 45–54, which are reported in Table C1 in Online Appendix C.

The transfer function $G(I)$ takes the following form:

$$\frac{G(I)}{\bar{I}} = \begin{cases} g_0 \text{ if } I = 0 \\ \left[g_1 + g_2(I/\bar{I})\right] \text{ if } I > 0 \end{cases},$$

where $\bar{I}$ is the mean household income. We estimate g_0, g_1, and g_2 using EU-SILC data on transfer incomes. We find that a household with no income receives a transfer that is about 5% of the mean annual household income in the economy. The transfers decline as a household gets richer and become zero around 2.4 times the mean household income.

The tax function, $T(I)$, is given by

$$T(I) = \begin{cases} 0, \text{ if } I \leq \widetilde{I} \\ I \times \max\{1 - \tau_0(I/\bar{I})^{-\tau_1}, 0\} \text{ if } I > \widetilde{I} \end{cases},$$

where again $\bar{I}$ is the mean household income. Households do not pay any taxes if their income is below a certain threshold $\widetilde{I}$. Beyond $\widetilde{I}$, households face a progressive tax schedule. We take estimates of $\tau_0 = 0.904$, $\tau_1 = 0.134$, and $\widetilde{I} = 0.47\bar{I}$ from García-Miralles et al. (2019). Households whose income is below 47% of the mean household income do not pay taxes. The parameter $1 - \tau_0 = 1 - 0.904 = 0.096$ gives the average tax rate for a household with mean income and parameter τ_1 determines the progressivity of taxes.

For unemployment benefits, we also use EU-SILC data and calculate the average income of unemployed individuals from unemployment benefits (which might be zero if an unemployed individual does not receive any unemployment insurance) as a fraction of the average household income. For college-educated women, we find $\theta_f = 0.058$, whereas for their husbands, $\theta_m = 0.095$.[20]

Finally, some 25-year-old married women in the data already have children. In the 2018 Spanish FS, 4% of native college-educated women in our cohort already have a child by age

[20] In the simulations, $\bar{I}$ is the average of incomes in households with and without college-educated wives.

TABLE 5
THE MODEL VS. DATA—INEQUALITY

	Model	Data	Source
Variance of wife log earnings	0.15	0.21	Table B7
Variance of husband log earnings	0.17	0.21	Table B7
Husband and wife earnings correlation	0.49	0.44	Table B7
Hourly wage gender gap	0.91	0.92	Table B7
Female wage growth (permanent)	Figure 3		MCVL
The gap in returns, perm. vs. temp.	17%	15%	Garcia-Louzao et al. (2023)
Temp. cont. wage penalty	−3.0%	−3.0%	Garcia-Louzao et al. (2023)
Av. earn. at 44, $\leqslant 50\%$ in perm. contracts	1.13	1.15	Table 2
Median wealth to income ratio, hholds, 35–44	2.40	2.60	The EFF

NOTES: This table reports moments on inequality generated by the model and their data counterparts.

TABLE 6
THE MODEL VS. DATA – LABOR MARKET, FEMALES

	Model	Data	Source
Unemployment/population, 25–27	0.20	0.22	Figure 5
Permanent/employed, 25–27	0.46	0.45	Figure 5
Unemployment/population, 25–44	0.08	0.08	Table B6a
Out of labor force/population, 25–44	0.15	0.15	Table B6a
Fraction temporary, female workers, 25–44	0.26	0.25	Table B6a
Employment/population, 25–44, mothers	0.72	0.76	Table B6a
Employment/population, 25–44, mothers with babies	0.70	0.71	Table B6a
(Employment/population, 25–44, nonmothers)	0.81	0.81	Table B6a
Trans prob. temporary to unemployment, 30–34	5.30	5.37	Table B8a
Trans prob. permanent to unemployment, 30–34	0.53	0.55	Table B8a
Fraction of nonmothers on regular contracts	0.57	0.56	Section 2
Fraction of mothers on regular contracts	0.70	0.74	Section 2

NOTES: This table reports moments on labor market outcomes generated by the model and their data counterparts. The moment reported in parenthesis is implied by two moments that precede it.

25; 51% of these children are babies, and the rest are school-aged children. Therefore, we assume that the same fraction of women at age 25 in the model have babies or school-aged children.

4.2. *Calibrated Parameters.* In order to calibrate the remaining parameters, we first assume that the ability distribution, $F(a_f, a_m)$, is jointly normal with parameters $(\mu_{a_f}, \mu_{a_m}, \sigma_{a_f}, \sigma_{a_m}, \rho)$, where ρ is the correlation coefficient, and normalize $\mu_{a_m} = 1$. For the initial, that is, age 25, labor market states of females, we assume that a fraction ϕ_{25} of them have an employment opportunity whereas the remaining $1 - \phi_{25}$ do not. Among those with a job opportunity, a fraction $\phi_{25,P=1}$ can start their lives with a permanent contract, and the rest with a temporary one. Given these job opportunities at age 25, women decide whether to take jobs that they are offered. These are 29 parameters to be calibrated:

$$\{\underbrace{\mu_{a_f}, \sigma_{a_f}, \sigma_{a_m}, \rho}_{\text{ability}}, \underbrace{\eta_1^P, \eta_2^P, \zeta_0, \delta_h, \phi_{25}, \phi_{25,P=1}, \phi, \pi, \delta_P}_{\text{human capital/labor market transitions}}, \underbrace{\beta, \gamma_1, \gamma_2, \gamma_3, \overline{n}, \chi, \xi}_{\text{preferences}}, \underbrace{\psi, \kappa}_{\text{inflexibility}}, \underbrace{\varphi, \iota, d_1, d_2}_{\text{childcare}}\}.$$

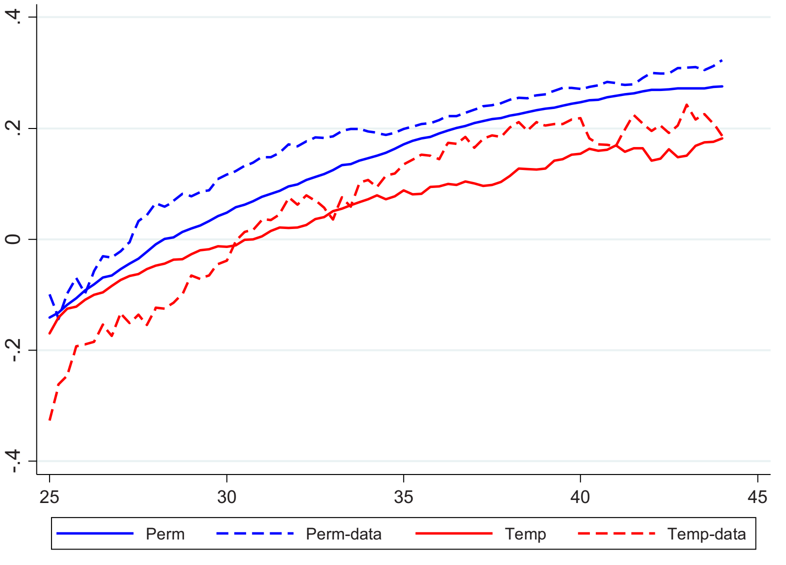
We organize the moments that we use to discipline these parameters into three groups: inequality (Table 5), labor market outcomes (Table 6), and fertility (Table 7).

The first block of targets in Table 5 determine the parameters of the ability distribution. Mean female ability, μ_{a_f}, maps into gender wage gap (recall that $\mu_{a_m} = 1$), whereas σ_{a_f} and σ_{a_m} into variances of male and female log hourly wages. The correlation between spousal correlation for log-hourly wages in the data (0.44) determines ρ.

TABLE 7
THE MODEL VS. DATA—FERTILITY

	Model	Data	Source
Fertility timing	Figure 4		The FS
(Average age at first birth)	31.6	32.0	The FS
Fraction childless	0.18	0.17	The FS
Fraction with one child	0.15	0.21	The FS
Fraction with two children	0.56	0.49	The FS
(Fraction with three or more children)	0.11	0.11	The FS
(Number of children)	1.60	1.62	The FS
Median childcare costs/household income, $i = 1$	0.05	0.05	The FS
Median childcare costs/household income, $i = 2$	0.03	0.03	The FS
Informal child care, mothers with babies, employed	0.31	0.31	Table B9

NOTES: This table reports moments on fertility generated by the model and their data counterparts. The moments reported in parentheses are implied by moments that proceed them.



SOURCE: The MCVL, 2005–10. Sample: Native, married women with at least a college education born between 1966Q1 and 1971Q4.

FIGURE 3

AGE–EARNINGS PROFILES, FEMALES, MODEL VS. DATA

The next block of targets in Table 5 helps us to pin down the parameters for female human capital accumulation. Recall that when a woman works, her human capital grows according to $\ln(h') = \ln h + \ln(1 + \eta_1^P + \eta_2^P j)$, and her earnings are given by $w_f(a, h, P) = \zeta_P a h$ with $\zeta_0 < \zeta_1 = 1$. When she is unemployed or out-of-the labor force, her human capital depreciates at rate δ_h. In order to select these parameters, we proceed as follows. We first choose η_1^P and η_2^P for permanent workers ($P = 1$) to match the age-earnings profile for college-educated women with a permanent job (Figure 3). We use the estimates by Garcia-Louzao et al. (2023), who calculate how accumulated experience in temporary and permanent jobs affects wages in Spain. In a Mincerian regression for females, they find that each extra year of experience in a permanent job increases current wages by 3.85%, whereas the increase for each extra year of experience in a temporary job is 2.32% (see their Online Appendix Table A8). The same regression also implies that a current temporary job is associated with a 3% earnings penalty.[21]

[21] Online Appendix Table A8 in Garcia-Louzao et al. (2023) does not report all of the estimated coefficients. We are grateful to the authors who provided us with a full set of estimates.

In order to determine η_1^P and η_2^P for temporary workers ($P = 0$), we assume that $\eta_2^1 = \eta_2^0$, and select η_1^0 and ζ_0 so that when we run a regression with the simulated data, we reproduce the same gap in returns to experience and the current wage penalty for a temporary job.

We select δ_h so that a married woman who spends 50% or more of her working life in permanent contracts has about 15% higher earnings at age 44 compared to a woman who spends less than 50% (as documented in Table 2 in Section 2). Since temporary contracts are less stable in the model, they are associated with more frequent spells of nonemployment. Hence the impact of employment history on earnings at age 44 provides a natural target to discipline δ_h. Figure 3 shows the resulting age–earnings profiles for women in permanent and temporary contracts.

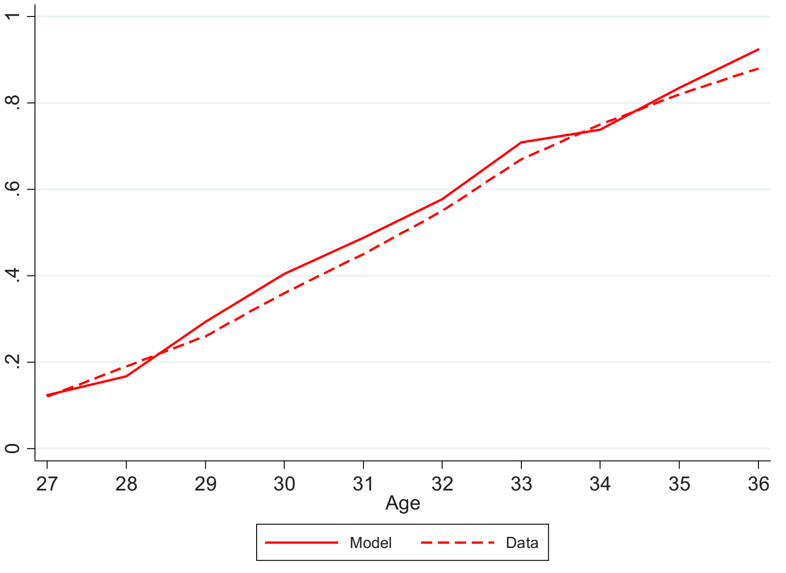
Finally, to calibrate the discount factor, β, we target the median wealth-to-income ratio for households with a college-educated wife who is between ages 35 and 44. We calculate wealth-to-income ratio using data from the Spanish Survey of Household Finances (Encuesta Financiera de las Familias, EFF).

The next set of targets pertains to labor market outcomes (Table 6). Again, the mapping between some parameters and targets is straightforward. In the model, an unemployed female receives a job offer with probability ϕ. She can accept the offer and start working the next period, or decline it. If she declines the offer, she decides whether to continue to be unemployed or move out of the labor force. The parameter ϕ is chosen so that the model generates an 8% unemployment rate for women between ages 25 and 44. The parameter ϕ_{25} (fraction of women of age 25 who have an opportunity to work) is calibrated to match the fraction of unemployed women between ages 25 and 27 in the data, and the parameter $\phi_{25,P=1}$ (fraction of jobs that are permanent for women of age 25 who have an opportunity to work) determines the share of women who are employed in permanent contracts at age 25.

In the model, a fraction ψ of jobs have split-shift schedules and they have a time cost of κ. These parameters help us to match the fraction of regular (nonsplit) contracts among mothers and nonmothers. In the benchmark economy, 60% of jobs have a regular schedule ($\psi = 0.4$). But the share of mothers with a regular-schedule job is higher, 71%, since mothers are more likely to decline an offer with a split-shift schedule. Other targets in Table 6 (participation, employment, and unemployment outcomes among women with or without children) determine preferences for leisure (χ), time cost of children (ι), and the time cost of participation (ξ).

Finally, the fraction of female workers with a temporary contract and transitions from temporary and permanent contracts to unemployment identify the promotion probability (π), and destruction rates for temporary and permanent jobs (δ_0 and δ_1). Each temporary (or permanent) job has an exogenous destruction rate in the model. But the transitions to unemployment, and as a result, job durations, are endogenously determined since they depend on whether women choose to stay unemployed or leave the labor force upon the termination of their jobs. Employed women can also quit and move to unemployment or out-of-the-labor force. In the model, women are less likely to be promoted to a permanent position than men. In the LFS-flows sample, where we can calculate transitions among employment, unemployment, and out-of-labor force, and promotions from temporary to permanent contracts, for ages between 30 and 34, each quarter, about 6.4% of college-educated women are promoted from a temporary to a permanent contract. For married men with a college education, the transition rate is 8.8%, or 2.4 percentage points higher. The difference can be due to selection if men and women with temporary contracts have different characteristics, such as the sector of employment, occupation, and tenure. Lower promotion rates of women might also reflect statistical discrimination by employers in the presence of more frequent career interruptions. In Online Appendix B, Table B4 shows that college-graduate women are 20% less likely to be promoted than men, even after controlling for observable characteristics.

The last set of targets pertains to fertility and childcare (Table 7). First, we target the level and timing of fertility. Figure 4 shows the fraction of women who had their first child below



SOURCE: The FS, 2018. Sample: Married native women with at least a college education born between 1966 and 1971.

FIGURE 4

FRACTION OF WOMEN WITH A FIRST BIRTH BELOW A GIVEN AGE

a certain age in the data and the model. The other fertility targets include the fractions of childless women and those with one, and two or more children. We also report, in parenthesis, the average age at first birth and the completed fertility outcomes closely associated with these moments. These targets determine parameters that govern how much households value children (γ_1, γ_2, γ_3 and $\overline{n}$). In particular, whereas $\overline{n}$ helps us to match the fraction of childless women, γ_1 and γ_2 determine the level of fertility and its relation to household income. The heterogeneity in γ_3, on the other hand, influences the dispersion in the timing of first births (Figure 4).

Second, we target the fraction of household income spent on childcare to pin down d_i ($i = 1, 2$), and the fraction of employed mothers with babies who use informal care to discipline the share of women with access to informal care (φ). Recall that in the model economy, an exogenous φ fraction of households have informal care and do not pay any childcare costs, whereas others pay a fixed childcare cost. In the benchmark economy, $\varphi = 0.216$ fraction of households has access to informal care. Since informal care lowers childcare costs, it is more common among employed mothers with babies in the model (32%). We calculate the childcare costs from the FS. Independent of whether they make any payment, the median spending on childcare for employed mothers with babies (ages 0–2) is about 5% of household income. For employed mothers with school-age children (ages 3–14), the same figure is 3%.[22] Childcare costs, d_1 and d_2, are chosen to replicate these targets.

Table 8 shows the calibrated parameters. A few parameters in Table 8 can be compared directly with their data counterparts. The calibrated value of $\kappa = 0.138$ implies that the fixed time cost of a split-shift schedule job is about 1.98 hours more per day (assuming 100 available hours per week). This is very close to two hours of fixed-cost for split-shift jobs that we calculate from the STUS data in Section 2. The model implies a large value of time cost associated with looking for a job, $\xi = 0.79$, which is necessary to generate the participation rate in the data.

[22] In the FS, we only observe the childcare costs in 2018. The FS sample is not restricted to the particular cohort we study in the article, and includes all employed native married women with a college degree.

TABLE 8
CALIBRATED PARAMETERS

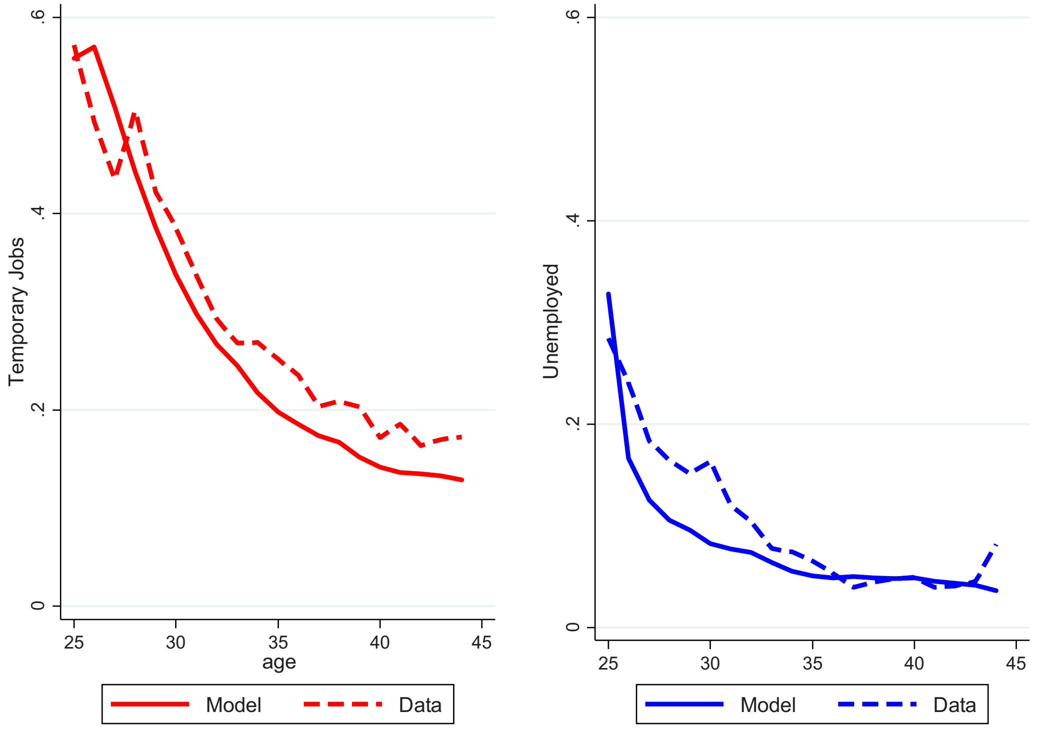
Parameter	Description
Ability Distribution	
$\mu_{a_f} = 0.87, \sigma_{a_f} = 0.41, \sigma_{a_m} = 0.44, \rho = 0.27$	Joint log normal distribution
$\mu_{a_m} = 1$	Normalized
Preferences	
$\beta = 0.9993$ (quarterly)	Discount factor
$\gamma_1 = 0.40, \gamma_2 = 0.442, \overline{n} = 2.40$	Preferences for children
$\gamma_3^{high} = 24.0\ \gamma_3^{med} = 37.5, \gamma_3^{low} = 49.5$	Preferences for children
$\chi = 0.745$	Preferences for leisure
Cost of Children	
$d_1 = 0.14$	Childcare cost, youngest is a baby
$d_2 = 0.10$	Childcare cost, youngest is a school-age child
$\varphi = 0.216$	Frac. of households with informal care
$\iota = 0.105$	Time cost of babies
Female Wages	
$\eta_1^P = 0.0214, \eta_2^P = -0.00045, \eta_1^T = 0.0198$	Human capital accumulation
$\zeta_0 = 0.972$	Temporary contract wage penalty
$\delta_h = 0.006$ (quarterly)	Depreciation rate
Labor Market	
$\xi = 0.79$	Time cost of participation
$\pi = 0.047$	Promotion probability
$\phi = 0.23, \phi_{25} = 0.53$	Job finding rate
$\delta^1 = 0.0065, \delta^0 = 0.055$	Job destruction rate
$\kappa = 0.138$	Time cost of split jobs
$\psi = 0.40$	Frac. of split-schedule jobs

NOTES: This table reports the parameters estimated by matching the moments in Tables 5, 6, 7.

Finally, we comment on $\frac{exp(j-\gamma_3)}{1+exp(j-\gamma_3)}$ term in the utility function. In the simulations, γ_3 takes three values with equal probabilities: $\gamma_3^{high} = 49.5$, $\gamma_3^{med} = 37.5$, and $\gamma_3^{low} = 24.0$. Given our estimated value for γ_3^{high}, the utility from children is almost zero for a 25-year-old woman, and remains very low all along a woman's life-cycle. For women with γ_3^{low}, on the other hand, utility from having children is already high at age 25 and picks quickly around early 30s. As a result, this heterogeneity helps us to push women away from having their first child at very young (25 to 28) ages in the model and allows us to generate a realistic distribution of age at first births, as shown in Figure 4.

4.3. *Nontargeted Moments.* In this section, we present several nontargeted moments from the model and their data counterparts. Figure 5 shows the fraction of employed women with a temporary contract (left panel) and the share of women who are unemployed (right panel), where initial values, that is, the average values for ages between 25 and 27, are targeted moments. Both in the model and in the data, most women start their career with temporary jobs, that is, at around age 25 close to 60% of women work with a temporary contract. Between ages 25 and 44, the fraction of women with a temporary contract is about 25%. The fraction declines smoothly as women age, although by age 40, about 15% of women still work with a temporary contract. The unemployment rate is high for young women, around 30%. It then falls quickly between ages 25 and 30, and by age 40, about 5% of women are unemployed. The model does an excellent job of generating these patterns.

Table 9 shows the model's performance on several other dimensions that are not directly targeted in the calibration. First, the model captures labor market dynamics in the data. In the model, temporary jobs last around eight quarters, close to what we observe in the data. Second, the model replicates the positive correlation between female employment and household



SOURCE: The LFS, 1987–2010. Sample: Native, married women with at least a college education, born between 1966 and 1971.

FIGURE 5

WORKERS WITH A TEMP. CONTRACT (LEFT), FRAC. UNEMPLOYED (RIGHT), FEMALES, MODEL VS. DATA

TABLE 9

NONTARGETED MOMENTS

	Model	Data	Source
Average job tenure, temporary contracts	8.17	6.95	MCVL
Employment/pop., females, 25–44, hhold inc., 1st tercile	0.54	0.58	Table B10
Employment/pop., females, 25–44, hhold inc., 2nd tercile	0.94	0.83	Table B10
Employment/pop., females, 25–44, hhold inc., 3rd tercile	0.84	0.93	Table B10
Number of children at 44, female earnings, 1st tercile	1.19	1.35	Table B11
Number of children at 44, female earnings, 2nd tercile	1.57	1.49	Table B11
Number of children at 44, female earnings, 3rd tercile	1.67	1.72	Table B11
Number of children at 44, hhold inc., 1st tercile	1.50	1.43	Table B11
Number of children at 44, hhold inc., 2nd tercile	1.49	1.64	Table B11
Number of children at 44, hhold inc., 3rd tercile	1.81	1.83	Table B11
Prob. of a birth, conditional contract type at $t-4$, %			
Permanent	2.3	3.4	Section 2
Temporary	1.8	2.4	Section 2
Average number of children at 44			
on temp. contracts, ages 25–44 $<$ 50%	1.46	1.53	Table 2
on temp. contracts, ages 25–44 $\geq$ 50%	1.31	1.27	Table 2
Fraction of childless at 44			
on temp. contracts, ages 25–44 $<$ 50%	0.22	0.20	Table 2
on temp. contracts, ages 25–44 $\geq$ 50%	0.24	0.22	Table 2

NOTES: This table reports the moments that are not used to estimate parameters and their data counterparts.

TABLE 10
EFFECT OF TEMPORARY CONTRACTS ON FIRST BIRTHS, ODDS RATIO

Specification	Estimate
Baseline	0.84
With fertility preference controls	0.76
With preference and childcare access controls	0.71

NOTES: This table reports the estimates from a regression of first births on temporary contracts, as specified by Equation (1) in Section 2, using simulated data. The first row replicates Equation (1), and shows the odds ratio estimate. The second and third rows show the same coefficient with controls for unobserved heterogeneity.

income. The employment-to-population ratio increases from 60% for households in the bottom tercile of the household income distribution to 90% for those at the top tercile.

Third, we present additional moments on fertility. Both in the model and the data, fertility is increasing in female earnings and total household income. The fertility gap at age 44 between a woman at the bottom tercile of the earnings distribution and the one at the top is about 0.4, which the model captures well.

Finally, the model replicates the effects of temporary contracts on fertility. A childless female who has a temporary contract at $t-4$ (four quarters ago) has a much smaller chance of becoming a mother; 1.8% in the model and 2.4% in the data. In contrast, the probability of a new birth for women with permanent contracts is 3.4% in the data and 2.3% in the model. Furthermore, these short-run effects have a cumulative impact along the life cycle. A female who spends 50% or more of her working life with a temporary contract has 1.31 children in the model, whereas one who spends less than 50% of her working life has 1.46 children. The gap is slightly larger in the data, 1.27 versus 1.53 children. The positive correlation between exposure to temporary contracts and childlessness in the data is captured by the model.

4.4. *Unobserved Heterogeneity and Selection.* The model economy features two sources of unobserved heterogeneity. First, women differ in their preferences for the timing for children, captured by heterogeneity in parameter γ_3 in the utility function—see Equation (4). Women with a higher γ_3 parameter prefer to have their children later in their life cycle. Second, women differ in whether they have access to informal care, which affects childcare costs—see Equation (7). How does unobserved heterogeneity affect fertility decisions?

To answer this question, we focus on the impact of temporary contracts on first births, and reproduce regression model specified in Equation (1) with the simulated data. Table 10 shows the results. The results in Table 1 in Section 2 show that for childless women, being employed with a temporary contract reduces their odds of having a (first) child by 28%. In the model, the odds for women with a temporary contract are 16% lower than the odds for those with a permanent contract.[23]

In Table 10, we also show what happens to the effect of temporary contracts on first births when we control for unobserved heterogeneity. In the model, childless women who prefer to have their children later (those with higher γ_3) are more likely to have permanent contracts. Since these women delay fertility, they are more likely to be childless when they are promoted to a permanent job. Since women with high γ_3 are less likely to end up having children, this nonrandom selection will downward bias the impact of temporary contracts on first births. This is exactly what we find. Once we control for fertility preferences, the impact of temporary contracts on the odds of having a newborn is more significant: The odds of having a first birth are 24% lower for women with a temporary contract. Similarly, childless women with permanent contracts are also more likely to be the ones without access to informal care (again, they are more likely to wait for a permanent contact before having children). Such nonrandom selection will also downward bias the impact of temporary contracts on first births. In Table 10,

[23] There are other features of permanent contracts that make them easier to combine with fertility, such as the possibility of reduced hours with job security (Fernández-Kranz and Rodríguez-Planas, 2021).

TABLE 11
MARRIED WOMEN'S LABOR MARKET OUTCOMES AT AGE 44

		Split-Shift Schedules				
	Permanent	Without Access to	With Access to	Fertility Preferences (γ_3)		
Ability	Jobs	Informal Care	Informal Care	1	2	3
1	0.62	0.26	0.29	0.23	0.28	0.29
2	0.69	0.39	0.38	0.39	0.36	0.41
3	0.67	0.35	0.39	0.35	0.35	0.38
4	0.69	0.40	0.40	0.40	0.40	0.40

NOTES: This table reports the labor market outcomes (fractions with permanent contracts and split-shift schedules), access to informal care, and fertility preferences in the model for women who are 44 years old, conditional on their ability.

when we also control for whether a woman has access to informal childcare, the impact of temporary contracts increases to 29%, which is almost twice as large as the effect we obtain from a regression that omits unobserved heterogeneity.

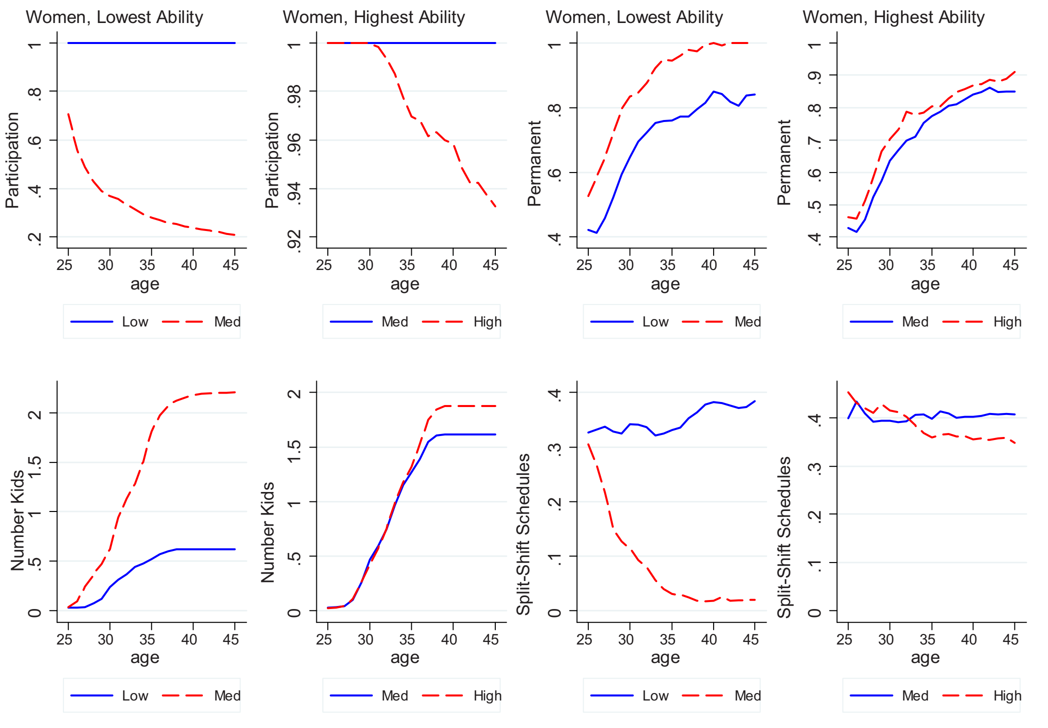
Next, we examine the significance of the endogenous selection of women into permanent and split-shift schedule jobs. Although the model incorporates an exogenous probability for transitions into permanent ones, the pool of women who ultimately secure permanent jobs is not random. Since labor force participation is a choice within the model, women with lower abilities are more inclined to leave the labor force. Consequently, those women who remain attached to the labor force and eventually obtain permanent positions tend to possess higher ability levels. This finding is demonstrated in Table 11.[24] Women with the highest ability level have a 7 percentage points greater likelihood of securing permanent contracts compared to those with the lowest ability.

The influence of ability becomes even more pronounced when considering selection into jobs with split-shift schedules. In the model, when an unemployed woman is offered a job, the job can have a regular schedule or a split-shift schedule. At this juncture, women have the option to accept the job and commence working, decline it and wait for a new opportunity, or decline it and exit the labor force. Due to the higher childcare costs associated with split-shift schedule jobs, women with lower abilities are less inclined to accept such jobs and instead opt to wait for positions with regular schedules. Consequently, higher-ability women in the model are more likely to occupy split-shift positions. Conversely, split-shift schedules are less burdensome for women who have access to informal care. As a result, they are more likely to remain in the labor force and accept split-shift jobs. For women with the lowest ability levels, access to informal care increases the probability of securing a split-shift schedule job by 3 percentage points (Table 11). Similarly, women who exhibit stronger preferences for delaying childbirth and, consequently, have fewer children, are also more likely to work with split-shift schedules. Among women with the lowest ability, those with the highest value of γ_3, which takes three values in the simulations, have a 6 percentage points higher likelihood of working in a split-shift schedule job compared to those with the lowest γ_3 value.

Finally, we present our findings regarding the impact of spouses' ability levels on the labor market and fertility outcomes throughout the life cycle. The left panels in Figure 6 illustrate the labor force participation (upper-left panel) and fertility decisions (lower-left panel) of women with the lowest and highest ability levels, where each line is conditional on husbands' ability levels, indicated as low, medium, and high in the figure.[25]

[24] In the simulations, the ability distribution of females is approximated using four grid points (ranging from 1 lowest ability to 4 highest ability), and the one for males by three grid points (low, medium, and high).

[25] There is positive assortative mating in the model, so women with ability level 1 (the lowest level) are matched with either low- or medium-ability husbands, and women with ability level 4 (the highest) are matched with husband with medium and high abilities.



NOTES: The left panel shows the labor force participation and the number of children for women in the model with the lowest and highest ability levels conditional on their husband's ability (low, medium, high). The right panel shows the share with temporary and split-shift jobs in the model for women with the lowest and highest ability levels conditional on their husband's ability (low, medium, high).

FIGURE 6

PARTICIPATION AND FERTILITY (LEFT) AND PERMANENT AND SPLIT-SHIFT JOBS (RIGHT)

For low-ability women matched with low-ability husbands, the labor force participation is very high and constant. However, if a low-ability woman is matched with a medium-ability husband, her participation gradually declines from approximately 80% to 20% throughout the life cycle. The labor force participation pattern is similar for women with higher ability. When high-ability women are matched with high-ability husbands, their participation also declines gradually, although their participation rates are always higher than those of lower-ability women. Low-ability households consistently have fewer children, and the number of children for women who do not fully participate in the labor force mirrors the decline in labor force participation.

Moving to the right panel of Figure 6, we examine the distribution of women working with permanent contracts (upper-right panel) and split-shift schedules (lower-right panel). When a low-ability woman is matched with a low-ability husband, she is less likely to have a permanent contract than a low-ability woman matched with a medium-ability husband. A low-ability woman matched with a relatively high-ability husband remains in the labor force only if she can secure a permanent job; otherwise, she tends to exit the labor force. Similarly, women whose husbands have relatively high ability are less likely to have split-shift schedule jobs, given their labor force participation. This pattern also holds for women with a higher ability, where having a high-ability husband allows them to be more selective and stay in the labor force only if they have permanent or regular-schedule jobs.

5. HOW DO LABOR MARKET INSTITUTIONS AFFECT FERTILITY?

In the benchmark economy, temporary contracts have a higher separation rate than permanent contracts. Each quarter, 5.50% of college-graduate women with temporary contracts

Table 12
COUNTERFACTUAL ECONOMIES I (WOMEN WITH A COLLEGE DEGREE)

	BM	(i) Single Contract	(ii) All Regular Job	(iii) Lower Childcare Costs
Age at first birth	31.6	31.7	31.8	31.9
Number of children	1.60	1.68	1.69	1.86
Fraction childless	0.18	0.12	0.11	0.03
Fraction with one kid	0.15	0.17	0.18	0.20
Fraction with ≥2 kids	0.67	0.71	0.71	0.77
Ages 25–44				
Partic./pop	0.85	0.94	0.93	0.85
Emp./pop	0.77	0.86	0.84	0.77
Emp./pop., nonmothers	0.81	0.83	0.84	0.79
Emp./pop., mothers	0.72	0.88	0.84	0.76
Emp./pop., mothers, with babies	0.70	0.89	0.84	0.74
Unem. rate	0.093	0.091	0.095	0.095
Regular, nonmothers	0.57	0.95	1	0.60
Regular, mothers	0.70	0.97	1	0.66
δ^0 (Separation, temporary)	0.055	0.0065	0.055	0.055
δ^1 (Separation, permanent)	0.0065	0.0065	0.0065	0.0065
d_1 (Childcare costs)	0.14	0.14	0.14	0.09
d_2 (Childcare costs)	0.10	0.10	0.10	0.07
κ	0.138	0.138	0	0.138

Notes: This table reports the outcomes for the benchmark (BM), counterfactual economies with a single contract (column i), all regular jobs (column ii) and lower childcare costs (column iii).

become unemployed, whereas the rate is only 0.65% for those with permanent contracts. Suppose that the separation rates are the same for both types of contracts and equal to the separation rate of permanent contracts, which is $\delta_0 = \delta_1 = 0.65\%$ per quarter. The separation rates for men remain unchanged from the benchmark values.

Table 12 presents the results for this scenario of a single contract with low separations (column i). In this economy, the TFR of college-educated women increases from 1.60 to 1.68, representing an increase of nearly 0.10 children per woman.[26] Childlessness declines from 18% to 12%, and more women have two or more children, which are, as we discuss in the introduction, two fertility measures for which Spain stands out among other high-income, low-fertility countries. Yet, the age at first birth does not change much. There are two forces in play. On the one hand, a single contract reduces income uncertainty for women, which increases incentives to have children. Given uncertain fecundity, more children imply a lower age at first births. On the other hand, women who decide to have more children under this scenario, those with fewer children in the benchmark, are more likely to be the ones with stronger preferences for late childbearing.

The higher fertility goes together with higher female labor force participation and employment—the participation rate for women between 25 and 44 increases from 85% to 94%, and the employment rate increases from 77% to 86%. The employment rate rises significantly for mothers and mothers with babies, and the employment gap between mothers and mothers with babies disappears. Finally, although more women enter the labor force and have babies, they wait to obtain regular-schedule jobs that are easier to combine with childbearing. Hence, almost all mothers work with a regular-schedule job. Therefore, eliminating dual labor markets reduces the prevalence of split-shift jobs endogenously. In the benchmark economy, split-shift schedule jobs make high labor market turnover associated with temporary contracts

[26] In this experiment, we do not eliminate the wage penalty for a temporary contract, that is, keep $\zeta_0 = 0.972$. Setting $\zeta_0 = 0$ has no additional impact on fertility.

more costly. Even if a woman finds a job quickly, she can end up with a split-shift schedule, making frequent unemployment spells more expensive.

Next, we study the role of inflexibility associated with split-shift schedules. We eliminate split-shift schedule jobs by setting $\kappa = 0$, which saves about two hours of fixed-cost of work. The TFR increases from 1.60 to 1.69, an increase as significant as the one we obtain in the single-contract economy (column ii in Table 12). There is again a substantial decline in childlessness and a rise in the number of women with two or more children. Since inflexibility, like duality, acts as a barrier to employment, both labor force participation and employment again increase, and the employment gap between mothers and nonmothers and between mothers with and without babies disappear. Therefore, the elimination of duality and split-shift schedule jobs makes Spain similar to other European countries not only in fertility but also in the employment-to-population ratio.

Finally, we lower the childcare cost, d, by 35% (column iii in Table 12). The choice of 35% is motivated by the existing childcare subsidies in Spain. Since 2003, working mothers with a child less than three years old receive 100 euros per month as a refundable tax credit.[28] The credit is about 35% of monthly spending on childcare by working mothers, 286 euros, in the FS. The experiment in column iii expands this policy to all working mothers, independent of the child's age.

Lower childcare costs increase fertility from 1.60 to 1.86. Although there is no increase in overall participation and employment rates, there is an increase in the employment rate of mothers and mothers with babies of 4 and 6 percentage points, respectively.[29] With lower childcare costs, the number of mothers increases. Since mothers are less likely to be employed to start with, even if the employment of mothers is larger, there is no effect on the overall employment rate. With the lower childcare costs, mothers are also more likely to accept split-schedule jobs, as reflected in the relatively lower incidence of regular jobs among mothers than in the benchmark.

In the benchmark economy, households pay income taxes according to a progressive tax schedule. Tax revenue is used to finance means-tested transfers and unemployment benefits, and the rest is assumed to be used to finance exogenous government spending. When we introduce childcare subsidies, we do not establish a specific tax to fund the childcare subsidies. Subsidies become another expenditure financed by total tax revenue, which increases due to higher employment of women. The total cost of childcare subsidies is small, about 0.5% of the total income in the economy. Childcare subsidies increase transfers to poor households. For households at the bottom income decile, for example, the after-tax-transfer income in the benchmark economy is about 3% higher than their gross income, which reflects the means-tested transfers. In the economy with childcare subsidies, the after-tax-transfer income for households in the bottom decile becomes 5.2% higher than their gross income.

In Table 13, we show the results when different reforms are implemented together. Eliminating duality and inflexibility together (column i) does not affect fertility beyond what we obtained when these reforms were considered in isolation. Without duality, women avoid split-shift jobs, so there is no additional impact. Next, we implement all three reforms together (column ii). The increase in fertility is substantial. Combining three changes increases the TFR for college-educated women to 1.96.

In column iii, we also extend the single contracts for husbands. The additional effect on fertility is small (1.98 vs. 1.96 children). As we show in Table B1 in Online Appendix B, temporary contracts reduce the odds of having a first child for men by about 20%. If we run a regression with the simulated data, the temporary contracts lower the odds of a new birth by 35% in the model. Hence, even though the model is consistent with the evidence in Table B1,

[28] We do not model this policy in the benchmark. The women in our analysis were born in 1966–71 and had their first child around age 31. As a result, they are unlikely to benefit from it.

[29] The size of the increase in the employment of mothers is consistent with the evidence provided by Sánchez-Mangas and Sánchez-Marcos (2008) and Azmat and Gonzalez (2010).

Table 13
COUNTERFACTUAL ECONOMIES II (WOMEN WITH A COLLEGE DEGREE)

	BM	(i) Single Contract + All Regular	(ii) Single Contract + All Regular + Lower Cost	(iii) Single Contract for All + All Regular + Lower Cost
Age at first birth	31.6	31.7	31.8	31.7
Number of children	1.60	1.69	1.96	1.98
Fraction childless	0.18	0.11	0.01	0.01
Fraction with one kid	0.15	0.17	0.16	0.15
Fraction with ≥2 kids	0.67	0.72	0.83	0.84
Ages 25–44				
Partic./pop	0.85	0.97	0.98	0.97
Emp./pop	0.77	0.93	0.93	0.92
Emp./pop., nonmothers	0.81	0.91	0.90	0.90
Emp./pop., mothers	0.72	0.94	0.94	0.94
Emp./pop., mothers, with babies	0.70	0.94	0.95	0.94
Unem. rate	0.093	0.049	0.049	0.050
Regular, nonmothers	0.57	1	1	1
Regular, mothers	0.70	1	1	1
δ^0 (Separation, temporary)	0.055	0.0065	0.0065	0.055
δ^1 (Separation, permanent)	0.0065	0.0065	0.0065	0.0065
d_1 (Childcare costs)	0.14	0.14	0.09	0.09
d_2 (Childcare costs)	0.10	0.10	0.07	0.07
κ	0.138	0	0	0

NOTES: This table reports the outcomes for the benchmark (BM), counterfactual economies with a single contract and all regular jobs (column i), single contract, all regular jobs, and lower child care (column ii), and a single contract for all (wives and husbands), all regular jobs and lower childcare costs (column iii).

our simulations show that once there is a single contract for women and all jobs have regular schedules, eliminating labor market duality for husbands has a small marginal effect on fertility for women.

In Table 12, when we move to a single contract economy or eliminate split-shift schedule jobs, there is an increase in the participation rate, but the unemployment rate does not change (columns i and ii in Table 12). However, when we implement these two reforms together, there is a significant decline in the unemployment rate (columns i and ii in Table 13). With single contracts, the participation rate increases from 85% to 94%, but the unemployment rate is the same, about 9%, in both the benchmark and the counterfactual. In a single-contract economy with a low separation rate, women are less likely to lose their jobs. But when they do, they still wait for a regular-schedule job, and the unemployment duration remains high. On the other hand, in an economy with only regular jobs, although women do not wait for flexible jobs, we still have a high separation rate for temporary contracts. Only when we combine two reforms, we get a significant decline in unemployment.

To put these results in perspective, recall that three model features make children costly for women with a temporary contract. First, households with working mothers incur childcare costs. Childcare costs are more binding when household members are on temporary contracts since wages associated with temporary contracts are lower, and there is a higher risk of becoming unemployed. Second, women with babies incur a time cost. This cost is relatively more important for women entering the labor force as they have to bear the participation cost as well. Furthermore, even when a woman finds a job, it can have a split-shift schedule, which comes with a fixed-time cost. Again, having a temporary contract, which ends up in unemployment with a high probability, is riskier for women with children. Finally, women's human capital grows as they work, and the growth is more substantial for younger women, making temporary contracts costly.

TABLE 14
THE ROLE OF SINGLE CONTRACTS (WOMEN WITH A COLLEGE DEGREE)

	BM	(i) Single Contract Low Sep.	(ii) Single Contract High Sep.	(iii) Single Contract Very High Sep.
Age at first birth	31.6	31.7	31.4	31.4
Number of children	1.60	1.68	1.58	1.87
Fraction childless	0.18	0.12	0.19	0.11
Fraction with one kid	0.15	0.17	0.15	0.13
Fraction with ≥2 kids	0.67	0.71	0.66	0.76
Ages 25–44				
Partic./pop	0.85	0.94	0.85	0.56
Emp./pop	0.77	0.86	0.78	0.46
Emp./pop., nonmothers	0.81	0.83	0.84	0.64
Emp./pop., mothers	0.72	0.88	0.72	0.32
Emp./pop., mothers, with babies	0.70	0.89	0.70	0.29
Unem. rate	0.093	0.091	0.091	0.18
Regular, nonmothers	0.57	0.95	0.59	0.60
Regular, mothers	0.70	0.97	0.71	0.66
δ^0 (Separation, temporary)	0.055	0.0065	0.017	0.055
δ^1 (Separation, permanent)	0.0065	0.0065	0.017	0.055
ϕ (Finding rate)	0.23	0.23	0.23	0.23
φ (Fraction split)	0.40	0.40	0.40	0.40

NOTE: This table reports the outcomes for the benchmark (BM), counterfactual economies with a single contract with low separation rates, which is the same experiment as column i in Table 12 (column i), single contracts with high separation rates (column ii), and a single contract with very high separation rates (column iii).

5.1. *The Role of Labor Market Duality.* There are two forces at play when we move from a dual to a single-contract economy. On the one hand, the labor market is less risky for women. The jobs now last longer, and workers are less likely to keep moving between employment and unemployment. Women also enjoy higher incomes due to lower unemployment and more substantial human capital accumulation. On the other hand, there is no reason to wait to obtain a better (permanent) job first and then have a child. All jobs are the same.

In column ii of Table 14, we try to separate the first effect (higher income with less risk) from the second one (waiting for a better job). We move to a single-contract economy but reduce job stability (by choosing a higher δ) so that the labor force participation is the same as the benchmark economy (85%). This experiment, *single-contract with high separations*, brings back lower income and high risk into a single-contract economy. Now, fertility does not increase. A low job-finding rate can also discourage women from entering the labor force.

This experiment suggests that duality per se does not affect the fertility decision of women. The income uncertainty generated by long unemployment spells limits women's entry into the labor force and lowers fertility. According to our analysis, even in a single contract economy, a low job-finding rate or a high job-destruction rate that keeps the participation at its benchmark economy levels can result in low fertility. Finally, to emphasize the importance of labor market uncertainty, we again consider a single contract with a high separation rate economy but set the separation rate to the separation rate of temporary contracts in the benchmark economy (column iii). Now a female has a 5.5% chance of losing her job each quarter. When the labor market is very risky, women stay out of the labor force, and the participation rate declines from 85% to 56%. The fertility increases significantly from 1.60 to 1.87 as the women who drop out of the labor force choose to have children.

5.2. *Women with Less than College Education.* We next conduct the same experiments for women with less than college education. The results are presented in Tables 15 and 16. In a single contract economy with low separations (column i in Table 15), the fertility of women

Table 15
COUNTERFACTUAL ECONOMIES I (WOMEN WITHOUT A COLLEGE DEGREE)

	BM	(i) Single Contract	(ii) All Regular Job	(iii) Lower Childcare Costs
Age at first birth	28.0	27.4	27.9	28.0
Number of children	1.60	1.29	1.60	1.79
Fraction childless	0.17	0.32	0.16	0.07
Fraction with one kid	0.16	0.13	0.17	0.18
Fraction with ≥2 kids	0.67	0.55	0.67	0.75
Ages 25–44				
Partic./pop	0.54	0.81	0.59	0.55
Emp./pop	0.41	0.72	0.44	0.41
Emp./pop., nonmothers	0.62	0.84	0.62	0.56
Emp./pop., mothers	0.31	0.63	0.36	0.37
Emp./pop., mothers, with babies	0.24	0.55	0.30	0.32
Unem. rate	0.25	0.11	0.25	0.25
Regular, nonmothers	0.59	0.58	1	0.56
Regular, mothers	0.64	0.66	1	0.64
δ^0 (Separation, temporary)	0.17	0.017	0.17	0.17
δ^1 (Separation, permanent)	0.017	0.017	0.017	0.017
d_1 (Childcare costs)	0.13	0.13	0.13	0.08
d_2 (Childcare costs)	0.09	0.09	0.09	0.06
κ	0.138	0.138	0.0	0.138

Note: This table reports the outcomes for the benchmark (BM), counterfactual economies with a single contract (column i), all regular jobs (column ii), and lower childcare costs (column iii).

Table 16
COUNTERFACTUAL ECONOMIES II (WOMEN WITHOUT A COLLEGE DEGREE)

	BM	(i) Single Contract + All Regular	(ii) Single Contract + All Regular + Lower Cost	(iii) Single Contract for All + All Regular + Lower Cost
Age at first birth	28.0	27.4	28.0	28.1
Number of children	1.60	1.33	1.74	1.85
Fraction childless	0.17	0.29	0.06	0.02
Fraction with one kid	0.16	0.14	0.18	0.17
Fraction with ≥2 kids	0.67	0.67	0.76	0.81
Ages 25–44				
Partic./pop	0.54	0.87	0.88	0.82
Emp./pop	0.41	0.78	0.79	0.73
Emp./pop., nonmothers	0.62	0.84	0.80	0.76
Emp./pop., mothers	0.31	0.73	0.78	0.72
Emp./pop., mothers, with babies	0.24	0.69	0.77	0.69
Unem. rate	0.25	0.11	0.11	0.11
Regular, nonmothers	0.59	1	1	1
Regular, mothers	0.64	1	1	1
δ^0 (Separation, temporary)	0.17	0.017	0.017	0.017
δ^1 (Separation, permanent)	0.017	0.017	0.017	0.017
d_1 (Childcare costs)	0.13	0.13	0.08	0.08
d_2 (Childcare costs)	0.09	0.09	0.06	0.06
κ	0.138	0	0	0

Note: This table reports the outcomes for the benchmark (BM), counterfactual economies with a single contract and all regular jobs (column i), single contracts, all regular jobs, and lower child care (column ii), and a single contract for all (wives and husbands), all regular jobs and lower childcare costs (column iii).

without a college degree declines significantly, from 1.60 in the benchmark economy to 1.29. This is the opposite of what we found for college graduates. Why are the results different? A more stable labor market with a single contract makes labor force participation for college and noncollege women more attractive. As a result, labor force participation increases for both groups. But the effect is much more substantial for noncollege women; the labor force participation rises from 54% in the benchmark economy to 81% in the economy with a single contract.

Women who are not in the labor force in the benchmark economy have higher fertility than those in the labor force. A single contract increases the fertility of those already in the labor force. For college graduates, the first effect dominates, and there is an increase in fertility. For noncollege women, the composition effect is significant and leads to lower fertility.

When we eliminate split-shift schedule jobs by setting $\kappa = 0$, fertility is not affected (column ii in Table 15). Again there are two forces. On the one hand, labor force participation increases, which tends to lower fertility. On the other hand, those already participating in the benchmark economy have more children since regular jobs are much easier to combine with childcare. Two effects compensate each other in this case. Column iii in Table 15 shows the results with lower childcare costs. In contrast to a single contract economy or one with all regular jobs, lower childcare costs do not affect participation (at least at the level of a 35% decline that we consider). Therefore, with lower childcare costs, those who already participate have more children, and fertility increases from 1.60 to 1.79.

Table 16 shows the results when we implement reforms together. In an economy with single contracts and all regular jobs (column i), fertility declines from 1.60 to 1.33, as the impact of single contracts on labor force participation dominates. As we also lower childcare costs, the picture looks different (column ii): Fertility increases from 1.60 to 1.74. But the increase is less substantial than the one for college graduates, which was from 1.60 to 1.96. With these three reforms, the completed fertility of married women (college and non-college combined) would be 1.80 children.

Finally, in column iii of Table 16, we extend single contracts to husbands. Such an extension had almost no effect on the fertility of college-educated women (column iii of Table 13). Now the completed fertility increases from 1.74 to 1.85, which is substantial. Economic resources their husbands provide are more critical for women without a college degree. As a result, their fertility behavior is more sensitive to what happens to their husbands.

5.3. *Results in Perspective.* The benchmark economy focuses on labor supply, savings, and fertility decisions of married women. The model can be extended along several dimensions: First, the analysis abstracts from the household formation. Labor market uncertainty can affect incentives to get married. From a risk-sharing perspective, income uncertainty makes marriage an attractive option. On the other hand, if marriage implies higher costs of consumption adjustments due to, for example, children and other consumption commitments, a higher income risk can lead to lower marriages. Santos and Weiss (2016) show that the rising income uncertainty between 1970 and 2000 in the US reduced incentives to get married. A move to a single contract economy reduces labor market uncertainty and, as a result, can increase incentives to get married.

Second, since we are unable to link husbands and wives in our primary data source, we abstract from joint labor supply and childcare decisions. In the model economy, husbands contribute to household income but do not share any childcare burden. A natural extension would be to study how labor market policies affect couples' joint labor supply and childcare decisions. In the current framework, labor market uncertainty and inflexibility discourage women from participating in the labor market since they are the ones who incur the time cost of childcare. In an environment where couples jointly decide on childcare arrangements, improvements in labor market conditions for women can improve their bargaining power within couples and lead to a more balanced distribution of childcare allocations. This can lead to further increases in fertility, as emphasized, for example, by Doepke and Kindermann (2019).

Finally, the model can also allow for richer labor market decisions. In order to keep the analysis focused on temporary versus permanent contracts, we abstract from part-time work. For our sample of married women, the share of part-time workers is about 23.5% (15.23% for those with a college education and 26.95% for those without a college degree). Part-time work is more common among married women with children (17.03% for those with a college degree and 29.83% for noncollege). Still, the share of women working part-time in Spain is relatively lower than in other European countries, such as Germany (36.7%) and Italy (32.6%). Since part-time work provides some flexibility for women, we expect that when we eliminate duality or split-shift jobs in a model with part-time work, some women will switch from part-time to full-time jobs. As a result, the impact on participation might be smaller.

The analysis shows that reforming labor market institutions and providing childcare subsidies would significantly increase the completed fertility of married women. How should we interpret these results? As a policy reform, the childcare subsidies are the easiest to understand and implement, and our counterfactual, a 35% subsidy, is based on an actual policy implemented in Spain. We view the elimination of split-shift work schedules as a move to regular working hours in Spain, a policy that has been on different governments' agendas for a long time. An economy where all contracts have a regular work schedule will overcome coordination failures that make such a change difficult without government intervention.

What about the implications of moving to a single-contract economy? Our analysis provides insights into the impact of a dual labor market on fertility incentives and labor force participation. However, it is important to note that shifting to a single contract system would also affect firms, although we have not explicitly modeled this aspect. Nonetheless, it is conceivable that firms would respond to changes in labor market regulations, such as increased duration of temporary contracts or the implementation of a single contract. These changes may influence the economy's job-finding or destruction rates. For instance, Fernández-Kranz and Rodríguez-Planas (2021) evaluated a 1999 Spanish reform that granted employment protection to workers with children under the age of 6 who requested a shorter workweek due to family responsibilities. Their findings indicate that the reform decreased the hiring of women and their promotion to permanent contracts. Therefore, in a model where firms can react to policy changes, it is reasonable to expect that the transition to a single contract economy may have more modest effects than our current analysis.

Since the analysis is partial equilibrium, we abstract from any explicit welfare calculations. Still, we can point to potential welfare gains associated with different reforms. First, there can be welfare gains from eliminating split-shift schedules if they persist due to coordination failure. Second, childcare subsidies allow mothers to cover childcare expenses, work, and build human capital. This can lead to welfare gains, as emphasized by Guner et al. (2020) in a general equilibrium analysis of childcare subsidies. Indeed, the increase in tax revenue associated with higher female labor force participation can be self-financing, as Koll et al. (2023) show for Germany. Finally, greater attachment of women to the labor force in a single contract economy also increases human capital accumulation and can be welfare-enhancing. Furthermore, reduced income uncertainty in a single contract economy can be valued by households if existing transfer programs are inadequate.

6. CONCLUSIONS

In this article, we examine the influence of labor market institutions on fertility decisions. Women with inflexible jobs requiring long and specific hours face significant challenges balancing work and childbearing responsibilities. Additionally, many European countries have a division between temporary jobs with low firing costs and permanent jobs with high firing costs. Young workers typically begin their careers with temporary employment and transition to permanent positions after moving through various temporary positions. The uncertainty of income during childbearing years negatively impacts fertility rates. To better understand these trade-offs, we construct and estimate a model that analyzes women's fertility choices and labor market decisions. We focus on Spain, which serves as a concrete example of inflexible working arrangements for women, such as split-shift schedules involving extended lunch breaks and late work-finishing times. Spain also has the highest proportion of workers with temporary contracts in Europe.

Our research investigates whether women would choose higher fertility rates under conditions that include a single contract system, the absence of split-shift jobs, and subsidized childcare. When these reforms are implemented collectively, they significantly impact fertility rates. The number of children at age 44 increases from 1.60 to 1.96 for college graduates and from 1.58 to 1.74 for women without a college degree. The average completed fertility rate for married women in the reformed economy reaches 1.80 children. Furthermore, these reforms substantially increase women's labor force participation, lower the female unemployment rate, and reduce the employment gap between women with and without children.

Additionally, when we extend single contracts to husbands, together with these three reforms, the additional effect on fertility for college-educated women is minimal, with completed fertility increasing slightly from 1.96 to 1.98. However, completed fertility rises from 1.74 to 1.85 for women without a college degree, as husbands' economic resources play a more significant role. Consequently, the average completed fertility rate in this scenario becomes 1.87 children.

Two key messages emerge from our analysis. First, the combination of split-shift schedules and temporary jobs creates significant challenges for individuals who wish to have children. Second, adopting labor market institutions that resemble those of other European countries can lead to higher employment rates for mothers and increased fertility rates.

Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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