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# Why not Choose a Better Job? Flexibility, Social Norms, and Gender Gaps in Japan*

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**ABSTRACT** Japan ranks 125th out of 146 countries in the World Economic Forum's Global Gender Gap Index 2023, well below many developed countries, and has one of the largest gender pay gaps among high-income countries. On the other hand, women's labor force participation is high in Japan. However, women are much more likely to work in non-regular jobs, which are associated with lower wages and fewer hours. Men, in contrast, have regular, higher-paid jobs with long-hours requirements. In this paper, I build and estimate a model where couples jointly decide their occupations and working hours. Occupations differ in their flexibility. Regular jobs require long working hours, and hourly wages are a convex function of hours worked. Non-regular occupations have a linear mapping between hours worked and hourly wages. The model also allows for social norms that penalize women who earn more than their husbands. Given the inflexibility of regular jobs and social norms, women are more likely to choose non-regular jobs or not to work, and allocate a larger share of their hours for home production. The model can account for all of the observed gender gaps in labor force participation, 33% in occupational choices, 74% in labor hours, and 34% in wages. Through the lens of the model, the inflexibility of regular jobs explains almost all the gaps in occupational choices and wages, while social norms that penalize women who earn more than their husbands account for all of the gap in the participation rate and half of the gap in hours worked.

**Keywords:** Gender wage gap, social norms, job inflexibility, home production
**JEL-codes:** J16, J22, J31

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# 1 Introduction

Gender gaps in employment and wages have significantly improved in high-income countries in recent decades. Nevertheless, there is one country that lags far behind: *Japan*. Although Japan is a country with a high GDP per capita ($39,312 in 2020), it ranks 125 among 146 countries in the Global Gender Gap Index of the World Economic Forum (2023).

Compared to other OECD countries, two features of Japanese labor markets stand out: high gender earnings gap and a high proportion of women working part-time. Panel (a) in Figure 1 compares the gender gap in median earnings of full-time employees for a set of high-income countries. Although the gaps between men and women are closing in all countries, there is surprisingly little convergence. The earnings gender gap in Japan was 22.5%, higher than the other high-income countries (except for Korea). The share of females who work part-time has been increasing steadily in Japan and reached 39.5% in 2020, again higher than other high-income countries, as shown in panel (b). Finally, panel (c) shows that Japan has one of the highest employment fractions, 80%, among high-income countries. Hence, higher female labor force participation in Japan goes together with high part-time work and significant gender gaps in earnings (Teruyama, Goto, and Lechevalier 2018).

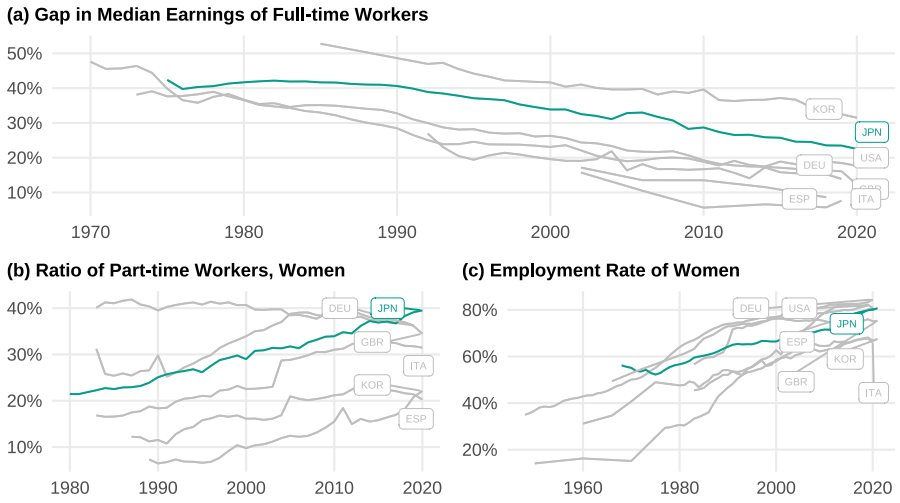


**Figure 1: Labor Market in Japan**. (a) The difference in median earnings of full-time employees where that of males is normalized as 100%. (b) Percent of part-time employment out of total employment. Part-time employment is defined as people in employment (whether employees or self-employed) who usually work less than 30 hours per week in their main job. Samples are aged over 15. (c) The employment rate is calculated by the ratio of the employed to the working-age population, from 15 to 64. Source: OECD.

These facts raise two related questions: Why is the gender gap in earnings large in Japan? Why is the number of part-time workers high for women in Japan? To answer

these questions, this paper proceeds in the following steps. First, I present key features of the Japanese labor markets. In particular, I focus on the differences between **regular** and **non-regular** jobs in the Japanese labor market. While a regular worker typically has a permanent contract and works 40 or more hours per week, a non-regular worker typically has a temporary contract and works less than 40 hours. I show that workers with a non-regular job have more flexibility in choosing their working hours and days or place of work (home vs. office). Women also indicate flexible working hours as their main reason to choose non-regular jobs.

Next, I show that there is a significant bunching just below 50% in the distribution of how much women contribute to the total household income. As in Bertrand, Kamenica, and Pan (2015), this suggests the existence of social norms that penalize wives who earn more than their husbands. Consistent with this fact, I also show that women's earnings and labor supply decline immediately after marriage in contrast to men's, suggesting the existence of the marriage penalty (Kleven, Landais, and Leite-Mariante 2023). I also find that job inflexibility, which I measured as the difficulty to take one or two days of leave at short notice, and social norms, measured as avoidance of wives earning more than their husbands, are larger in Japan than in other high-income countries.

Finally, I build a model of household labor supply where couples jointly decide on their occupations and working hours. I use the model as a quantitative laboratory to investigate the mechanism behind the gender gaps.

In the model, couples make joint occupation and labor supply decisions. Each partner draws a productivity level associated with regular and non-regular jobs and can choose to work in a regular or non-regular job. They can also choose not to work. Regular jobs are associated with a convex wage schedule, i.e., higher hours are associated with larger increases in wages. Non-regular jobs, on the other hand, have a linear relation between hours worked and hourly wages. The time of couples is used for market work, for home production, or for their joint leisure. Couples have to satisfy a given home hours requirement. This requirement differs across couples, which might reflect, for example, differences in childcare needs. I also assume that a couple incurs a utility cost if the wife earns more than the husband, reflecting existing social norms. Couples are also heterogeneous in this cost.

In the model economy, some couples will draw high productivity levels for regular jobs and both partners might choose to work in regular jobs. But this decision will also depend on the utility costs associated with wive's higher earnings than their husbands'. In other couples, the husband might work in a regular job and the wife might have a non-regular job or not work. The model parameters are calibrated to match the correlations between husbands' and wives' wages and hours worked as well as several moments of the joint earnings distribution for the couples.

Then, I contrast the gender gaps in the model and the data, which are *not targeted* in the calibration. The baseline model can explain a significant proportion of gender gaps: almost all gender gaps in participation rates, 33% in occupational choices, 74% in labor hours, and 34% in wages. The model also replicates the joint distribution of occupational choices of couples (regular, non-regular, and not-working), and the joint distribution of working hours conditional on their occupation choices.

What are the role of job inflexibility and social norms? Through the lens of the model, the inflexibility of regular jobs explains almost all the gaps in occupational

choices and wages, while social norms that penalize women who earn more than their husbands account for all the gap in the participation rate and half of the gap in working hours.

Finally, I conduct a counterfactual simulation of outsourcing housework. Japanese couples rarely use external housework services, and they have to spend a large amount of time to housework (especially when they have small children.) One factor for this is the very limited international migration to Japan, which could be a source of household labor.[1] I interpret the benchmark economy as a situation where the price of housework service is too high and is not used. Then, I allow households to purchase these services at the median wage of non-regular workers in the benchmark economy. The results show that access to housework services eliminates more than 80% of gaps in participation, occupational choices, and labor working hours.

**Related Literature** This paper contributes to the labor and macro literature that studies the relationship between home hours and gender gaps.[2] Goldin and Katz (2011) and Goldin (2014) suggest that some jobs have convex (non-linear) wage schedules and others have linear ones. This is also consistent with the fact that part-time workers earn less per hour (Aaronson and French 2004; Ameriks et al. 2020). Based on these facts, Erosa et al. (2022) models couples' decisions on occupations with different job flexibility. While their model captures the heterogeneous job flexibility by a simple and clear framework, they take home hours as given. In other words, they assume that women allocate more time to homework than men. The current model endogenously generates these differences with home production. Another related paper is Cubas, Juhn, and Silos (2019), which models a concentration of working schedules by modeling a penalty for missing work during peak hours. They argue that women with children are penalized because they devote their time more to household care. While they model job flexibility with detailed time-use data, I model job flexibility as the convexity of the wage schedules.

The line of work most relevant to my paper is Calvo, Lindenlaub, and Reynoso (Forthcoming), which models the assortative mating of labor and marriage markets. They argue that the complementarity of spouses' home hours forms a positive sorting of marriage and labor markets and their labor supply choices. Complementarity in home production also plays a key role in my model, however, the focus on social norms and flexibility of jobs differentiate the current paper.

My second contribution is to introduce social norms into a couple's occupational choice problem. As Bertrand, Kamenica, and Pan (2015) show for the US, there is a sharp gap in the wife's earnings relative to the husband's earnings in Japanese Data. By incorporating gender roles regarding working hours and income into the model, I can explain the large difference in occupational choice between men and women.

Finally, this paper deepens the economic understanding of gender gaps in Japan. Although Japan has one of the largest gender gaps in developed countries, the driving factors have not been intensely discussed in the Economics literature. Onozuka (2016) examines the observed convergence in the gender wage gap in Japan from 1992

1. Some papers discuss the impact of low-skilled migration on women's labor supply, e.g., Cortés and Tessada (2011), Barone and Mocetti (2011), Farré, González, and Ortega (2011).

2. See Albanesi, Olivetti, and Petrongolo (2022) for a recent review.

to 2002. He argues that women are pushed out from regular to non-regular jobs during the period. In addition, Teruyama, Goto, and Lechevalier (2018) points out that one of the main reasons for the increase of non-regular workers in the 2000s in Japan is the increase in women's labor supply. Furthermore, Kitao and Mikoshiba (2022) quantitatively analyze the role of fiscal policies on female labor force participation and occupational choices. Although these papers partially explain gender gaps in occupation and wages, few articles disentangle the structural cause of gender gaps in Japan. They are also silent on the role of social norms. To the best of my knowledge, this project is the first paper that simultaneously explains the gender gaps in labor force participation, occupations, working hours, and wages in Japan.

In the next section, I document the key facts about gender gaps in Japan. In Section 3, I propose the baseline model that embodies couples' decisions on occupational choices and working hours with social norms. Section 4 describes the calibration strategies. Section 5 reports the results for untargeted moments, and Section 6 discusses the four gender gap measurements. In Section 7 and Section 8, I discuss the mechanism of the gender gaps and investigate the role of social norms. Section 9 concludes.

# 2 Stylized Facts

This paper relies on two main data sources: the Japanese Panel Study of Employment Dynamics (JPSED) and the Survey on Dual-Income Couples' Household Economy and Attitudes 2014 (SDICHEA).[3] JPSED is a panel data since 2016, with the most recent data wave from 2020.[4] The sample is 57,284 individuals older than 15. This survey has information on earnings, working hours, and types of jobs. For married individuals, it also contains information on the spouse's job and earnings. The SDICHEA contains data for 2200 two-earner couples in the Greater Tokyo Area, aged from 35 to 49 for females and 30 to 55 for males. The SDICHEA was a one-time survey in 2014 and has information on earnings, working hours, housework, and types of jobs for couples.

## 2.1 Regular and Non-Regular Workers

In the context of Japanese statistics, the terms **regular** and **non-regular** jobs are widely used to categorize employment types. Since it is based on the job categorization of each company, there are no legal or precise definitions.[5] However, they are typically described as follows: A regular worker usually has a permanent contract, works 40 hours or more at a higher wage, while a non-regular worker has a temporary contract and works less than 40 hours at a lower wage.

Panel (a) in Figure 2 shows that 36% (45%) of male (female) regular workers work exactly 40 hours per week and 52% (33%) works more than that. On the other hand, only 24% (6%) of non-regular male (female) workers work more than 40 hours, and the majority (47% for male and 79% for female) work less than 40 hours. In addition, panel (b) shows that these two occupations differ in hourly wages. While 48% (61%)

3. I discuss the detail of data sets in Section A.
4. Data was distributed one year later. The data in 2019 was distributed in 2020 and called JPSED2020.
5. See Asao (2011) for a more detailed discussion on the definition of regular and non-regular jobs.

of non-regular male (female) workers work with a wage less than 1000 JPY[6], only 7% (18%) of regular workers do. Note that using the OECD definition of "less than 30 hours per week in their main job," 31% (61%) of male (female) non-regular workers would be categorized as being in part-time employment.

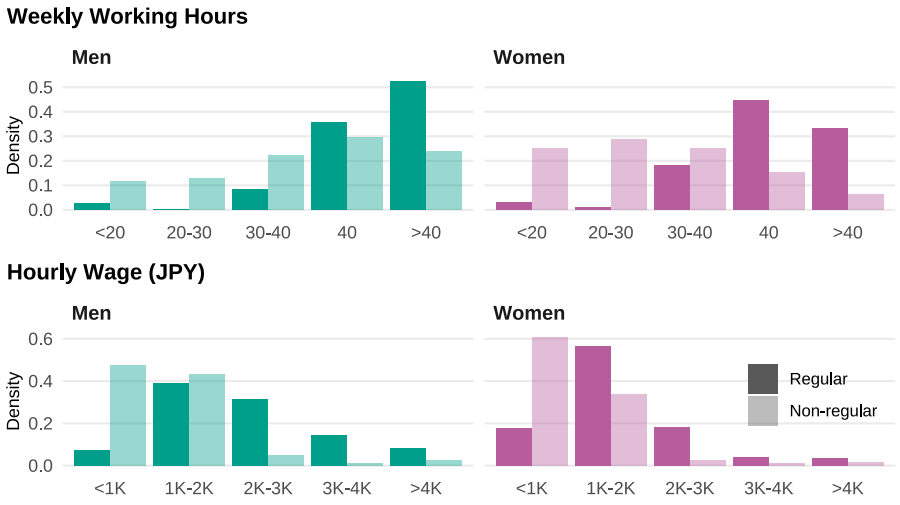


**Figure 2: Distribution of Weekly Working Hours and Hourly Wage.** The data is pooled data of JPSED2016-2020. The sample includes men and women aged between 25 and 59.

The gender gap in occupational choices is shown in Figure 3. We can see clear gender differences in occupational choices in married individuals. While almost 90% of men work as regular workers, less than 30% of women work as regular workers, and the ratio decreases by age. In addition, the proportion of non-regular workers is much higher in female employees; almost half of the female employees choose non-regular jobs.

## 2.2 Non-linear Wage Schedules and Job Flexibility

Why do women choose non-regular jobs? To answer the question, I map regular and non-regular jobs into non-linear and linear jobs in Goldin (2014), who emphasizes that some jobs have a highly non-linear (convex) pay structure with respect to working hours, while others have one almost perfectly linear. Given a non-linear wage schedule, a worker can work at a high wage in exchange for long working hours. On the other hand, a linear job worker can flexibly decide their working hours since there is no penalty in wages for reducing working hours. Hence, there is a trade-off between job flexibility and wage.

To highlight the difference between regular and non-regular jobs, I start the analysis with a regression similar to Bick, Blandin, and Rogerson (2022):

6. 1000 JPY ≃ 6.10 EUR

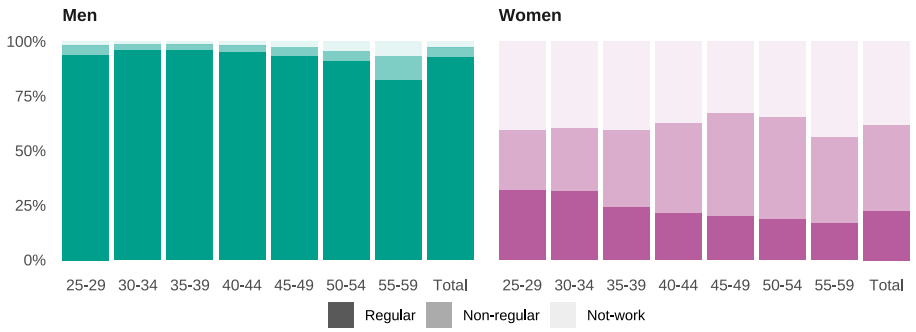


**Figure 3: Occupational Choice of Married Individuals.** The data is pooled data of JPSED2016-2020. The sample includes married men and women aged between 25 and 59.

$$y_{it} = a_i + \lambda_t + \left( \sum_{h \in H, h \neq 40} \beta_h 1_{ith} \right) + \gamma X_{it} + \varepsilon_{it}, \tag{1}$$

where $y_{it}$ represents the yearly earnings of individual $i$ at time $t$ and $X_{it}$ is his/her characteristics (age, square of age, educational degree, industry). I denote $H = \{20, 25, \dots, 60\}$ as 5-hour bins for weekly working hours, and $1_{ith}$ is an indicator if $i$'s working hours in the bin $h \in H$ at time $t$. As a result, the coefficient $\beta_h$ represents the relative earnings to one of 40 hours with various human-capital-related parameters controlled. In Figure 4, I plot the coefficient of the regression of Equation 1.

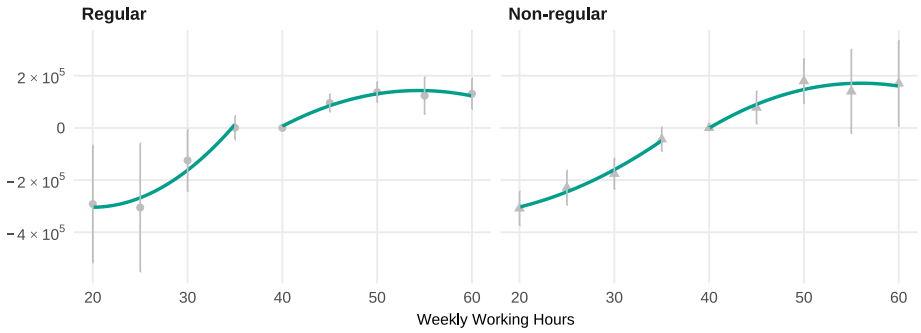


**Figure 4: Working Hours and Earnings.** The data is panel data of JPSED2016-2020. The sample includes men and women aged between 25 and 59. Each dot and line is the coefficient and 95% confidence interval of Equation 1. The blue line is a quadratic function fitting to the dots.

Consistent with Goldin (2014) and others, there is a convex shape for regular workers and a linear one for non-regular workers for working hours below 40. The convex wage schedule below 40 hours is a penalty for working less than 40 hours, which ex-

plains why the working hours of regular workers are concentrated at exactly 40 hours and more.

Figure 5 represents a direct measurement of the flexibility of regular and non-regular jobs, based on survey data. The questions asked regular and non-regular workers about the flexibility of their jobs with 5-scale measurement: 5 is the highest and 1 is the lowest. Each point shows the mean of the job flexibility in terms of working days, working hours, and working place. We can see that the regular worker has less flexibility in all aspects. Also, female non-regular workers have more flexibility than male regular workers, while female regular workers have the same inflexibility as male regular workers.

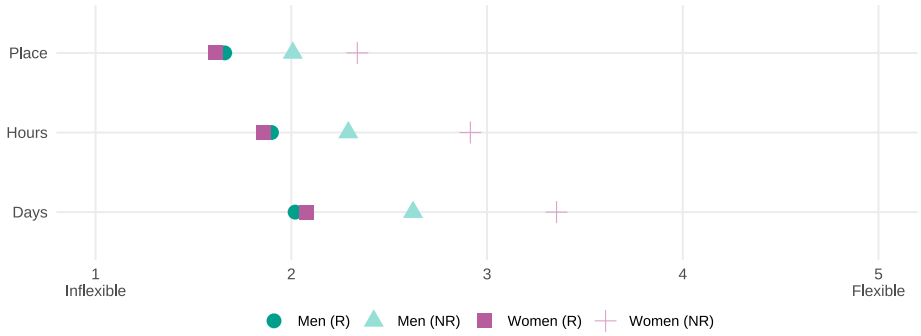


**Figure 5: Flexibility of Regular and Non-regular Jobs.** Pooled data of JPSED2016-2020. The sample includes men and women aged between 25 and 59. Each statistic is the mean of a 5-scale measurement about their jobs, 5 is the highest and 1 is the lowest.

Finally, if regular jobs require 40 hours of commitment and women have to allocate a large amount of time to housework, they may choose non-regular jobs, which are more flexible. Actually, Figure 6 supports this argument. This figure shows the reasons why married women in the non-regular workforce choose their current job. More than 60% of the women chose "job flexibility" as the reason and nearly 40% chose "housework". We can also see "cannot get regular jobs" is not the main reason (less than 10%) why they choose non-regular jobs.

## 2.3 Social Norms and Marriage Penalty

Bertrand, Kamenica, and Pan (2015) show that there is a sharp drop in the distribution of household income share at the line that wives earn more than their husbands. This type of gender role plays similarly in Japan. Figure 7 shows the distribution of the earning share of wives. We can see a clear gap between below 50% and above 50%, which suggests that there is a discontinuous behavior for whether a wife earns more than her husband.[7] In addition, the rising pattern just before 50% supports the strength of this social norm.

7. Following Kuehnle, Oberfichtner, and Ostermann (2021), I conduct robustness check with smaller bins and a non-parametric method. The results, which are similar, are in Section B.1.

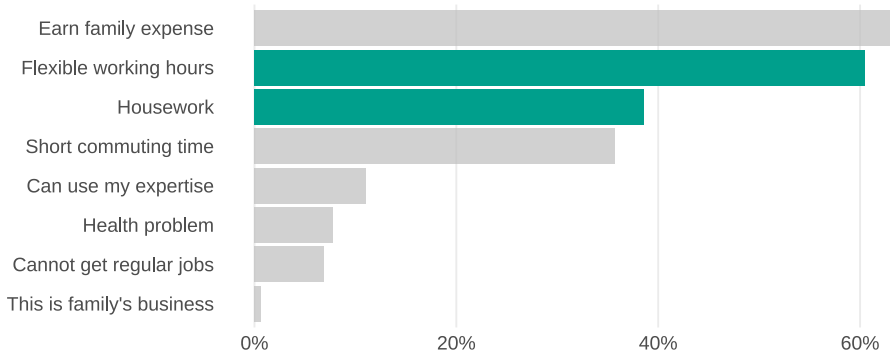


**Figure 6: Reasons Why Women Choose Non-regular Work.** The data is pooled data of JPSED2016-2020. The sample includes married women aged between 25 and 59 who have non-regular jobs. They can choose all the reasons why they choose non-regular jobs.


**Figure 7: Distribution of Relative Earnings.** The data is pooled data of JPSED2016-2020. The sample includes married couples of which participants of the survey are between 25 and 59 years old. Couples, where only one of them is working, are excluded. Each dot is the fraction of couples in a 0.05 relative earnings bin. The vertical line shows the relative earnings share is 0.5. The dashed line is the lowess smoother applied to the distribution allowing for a break at 0.5.

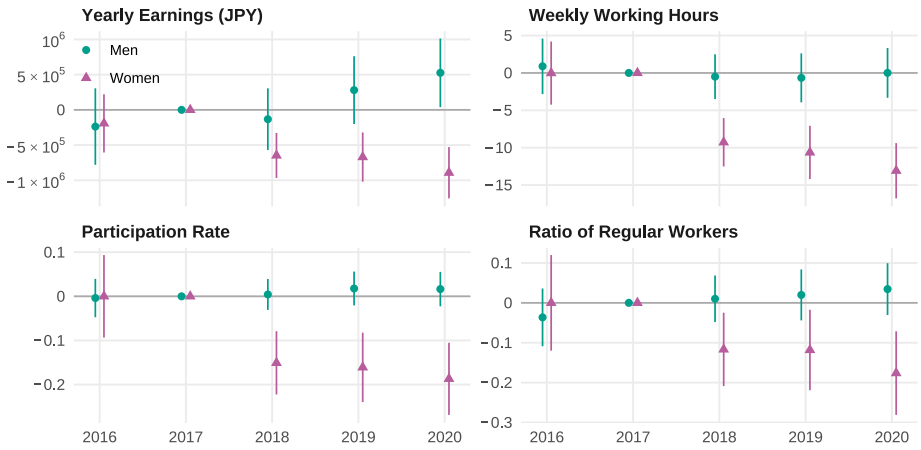


**Figure 8: Impact of Marriage on Labor Outcomes.** The data is pooled data of JPSED2016-2020. The sample includes individuals who got married in 2018. Each point represents the gap from the variable in 2017, one year before the marriage. The error bars show the 95% confidence interval.

If there is a penalty for higher wives' earnings, which reflects social norms, women, upon marriage, will be more likely to choose shorter working hours, non-regular jobs, or exit from the labor market. In Figure 8, I show the event study of labor market outcomes for women who got married in 2018. My approach follows the recent literature that studies the impact of children on gender gaps, e.g., Kleven, Landais, and Søgaard (2019), but focuses on marriage rather than the childbearing event.[8]

I focus on yearly earnings, weekly hours worked, participation, and the fraction of workers in regular jobs and report all outcomes relative to 2017, the year before marriage. Upon marriage, there is a sharp decline in all outcomes. Once married, women's participation declines by 15% points, and the fraction of them who work in a regular job also experiences a decline. The shift to non-regular employment is also associated with a significant decline in hours worked of about 9.3 hours per week. The resulting drop in yearly earnings is about $6.5 \times 10^5$ JPY (4600 euros). In contrast, participation, hours worked, and the share with regular jobs do not change for husbands, while their earnings increase substantially.

## 2.4 Comparison of Job Inflexibility and Social Norms with Other Countries

In this section, I compare Japan with other countries in terms of job flexibility and social norms. As I show in Section 7, job inflexibility and social norms play a central

8. For a set of European countries, Berniell et al. (2022) estimate the separate effects of marriage and childbearing on women's labor market outcomes, and find a relatively small role for marriage. Kleven, Landais, and Leite-Mariante (2023) compute the marriage and child penalty on employment rate for Brazil, China, Japan, Mauritius, Rwanda, Sweden, the United Kingdom, and Zambia. Herold and Wallossek (2023) calculates marriage earning gaps with German administrative data.

role in explaining the gender gap in Japan. While these factors are not unique to Japan, I show that job inflexibility and social norms are larger than those in other countries, and suggest that these two factors could be the main cause of Japan's lagging behind other countries in closing the gender gap.

Since there is no survey asking the same question about job inflexibility in Japan and other countries, as a proxy measurement, I use a question in JPSED and the Labor Force Survey of Eurostat. In the JPSED, respondents are asked to rate their agreement with the statement "I was able to choose my working days" on a scale of 1 to 5. Eurostat has a question of "Persons in employment by level of difficulty to take one or two hours off at short notice", the respondents answer on a 1-4 scale. To match the JPSED sample to Eurostat, I use men and women employed, aged between 35 and 49, and having children and rescale the level of difficulty to the 1-4 scale. Although this is not a direct comparison between Japan and other countries, Figure 9 indicates that regular workers in Japan might have more difficulty to take a day off.

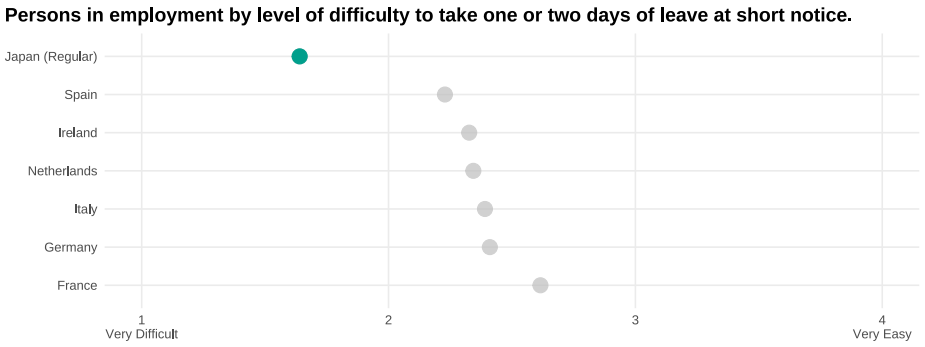


**Figure 9: Flexibility of Working Days.** Sample includes men and women employed, aged between 35 and 49, and having children. Data from the Eurostat Labor Force Survey in 2019 for European countries and JPSED for Japan. I use only regular workers for Japan.

In World Value Surveys, there is a question asking, "If a woman earns more money than her husband, it's almost certain to cause problems." The respondents answer on a 1-5 scale; 1 is "strongly agree" and 5 is "disagree strongly". Figure 10 plots the mean of the score by country. Among these high-income countries, Japan has the second strongest social norms after South Korea.

# 3 Model

The model economy is populated by married couples that consist of a male and a female, denoted by $g \in \{m, f\}$. A couple decides whether each member should work or not, and if they do, which occupations to choose. The occupations can be regular, $R$, or non-regular, $NR$. Not working is denoted by $NW$. If an individual works, they also decide on their market hours, $h_m$ and $h_f$. Each individual is endowed with one unit of time and a requirement of joint home hours $T$. This requirement differs across households, and each household decides their home hours $T_m$ and $T_f$, satisfying $T = T_m + T_f$. The

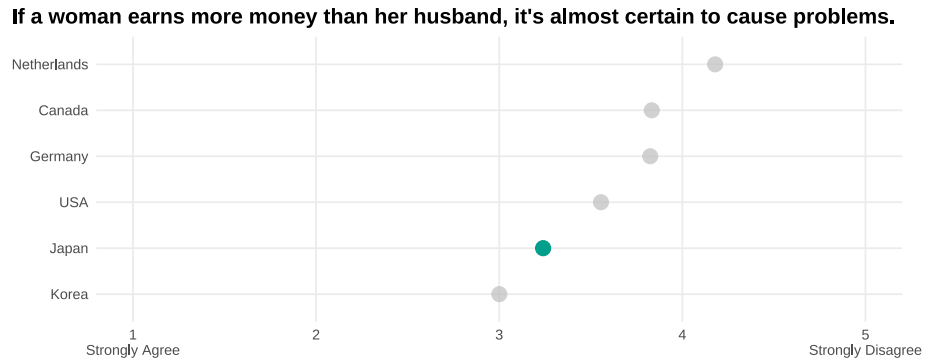


**Figure 10: Social Norms on Wives' Earnings**. Each data point is the mean of the answer by country. Source: World Value Survey Wave 7 (2017-2020).

remaining hours, $1 - h_m - T_m$ and $1 - h_f - T_f$, are allocated to joint household leisure. Each individual is endowed with a productivity (ability) level for the regular and non-regular job, denoted by $a_{g,R}$ and $a_{g,NR}$. These ability levels are drawn from a joint distribution for the couple.

**Utility Function** The couples maximize their joint utility:

$$\max_{h_m,h_f,T_m,T_f,j_m,j_f} U = \ln c + \gamma \ln H(1 - h_m - T_m, 1 - h_f - T_f) - \delta 1\{e_f > e_m\},$$

subject to

$$c = e_m(h_m, a_{m,j}, j_m) + e_f(h_f, a_{f,j}, j_f),$$

where $c$ is a consumption, and $\gamma$ is a preference parameter for the joint leisure of the couple, denoted by a function $H(\cdot)$. The index $j_g \in \{R, NR, NW\}$ denotes the occupational choices. The consumption is constrained by the couple's joint earnings $e_m$ and $e_f$, which depend on the type of occupation, productivity, and hours worked.

If the wife earns more than the husband, i.e., $e_f > e_m$, the couple incurs a utility cost $\delta$. Couples are heterogeneous in $\delta$. In particular, each couple draws $\delta$ from a cumulative distribution $F_\delta$. This heterogeneity captures differences in social norms across couples.

**Productivity** I also assume that the set of productivities $(a_{m,R}, a_{f,R}, a_{m,NR}, a_{f,NR})$ is different across couples. In particular, $(a_{m,R}, a_{f,R}, a_{m,NR}, a_{f,NR})$ is drawn from a log-normal distribution.

**Convex wage schedules** Following Goldin (2014) and Erosa et al. (2022), regular and non-regular jobs in the model differ in how hours worked, $h_m$, map into effective labor input that determines earnings. For regular jobs, effective labor input is a convex function of hours worked, i.e., the longer an individual works, the higher her effective labor input. This creates incentives to work longer hours since there is an implicit penalty for working short hours. In contrast, the relation between hours worked and effective labor input is linear for non-regular jobs. As a result, if one of the partners cannot supply long hours, they have an incentive to select a non-regular occupation.

Figure 2 shows that 36% (45%) of regular male (female) workers work exactly 40 hours per week and that 36% (45%) works more than that. This suggests that 40 hours of work per week is a standard requirement for regular workers and makes it difficult for women to work as regular workers.

To capture these two features, i.e., linear vs. non-linear jobs and a concentration of 40 hours per week, I assume that the production function for regular (non-linear) jobs is given by

$$e_R(h) = \begin{cases} a_R h^{1+\theta} & h \leq 40 \\ a_R \left( \bar{h}^{1+\theta} + \lambda_R \bar{h}^{\theta} (h - \bar{h}) \right) & h > 40 \end{cases}.$$

I assume that after 40 hours, the wage function becomes linear with a slope $\lambda_R$.

For non-regular jobs I have

$$e_{NR}(h) = \begin{cases} a_{NR} h & h \leq 40 \\ a_{NR} \left( \bar{h} + \lambda_{NR} (h - \bar{h}) \right) & h > 40 \end{cases}.$$

I assume that the earning curve of non-regular jobs is linear and has a different slope $\lambda_{NR}$ after 40 hours. The shape of $e_R(h)$ and $e_{NR}(h)$ are depicted in Figure 11.

Since $\theta > 0$, regular workers have an incentive to work longer hours. It also means that if one of the spouses chooses a regular job and works long hours, the other wants to work short hours and select non-regular jobs.

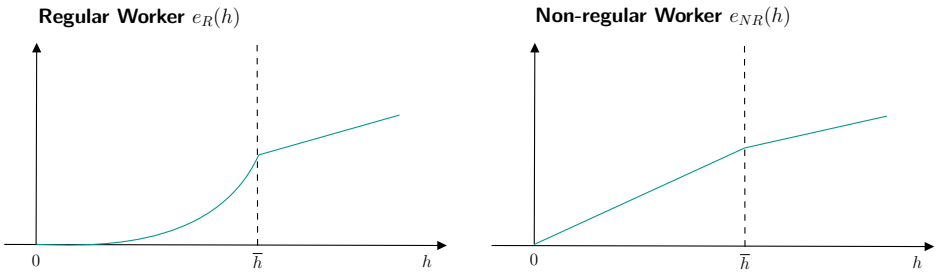


**Figure 11:** Convex Wage Schedules

**Joint Leisure Function** Leisure by husband and wife is produced by a CES function:

$$H = \left( \nu (1 - h_m - T_m)^{\xi} + (1 - \nu)(1 - h_f - T_f)^{\xi} \right)^{1/\xi},$$

where $\nu$ is a shared parameter and $\xi$ is the elasticity of the substitution of leisure hours. Leisure hours are complements if $\xi$ is less than zero, so there is an incentive to equalize their total working hours ($h_g + T_m$). I allow asymmetric productivity in home production by $\nu$, which is drawn from a cumulative distribution $F_\nu$. It might capture one of the causes of gender gaps. The emphasis on the complementarity versus substitution between wives' and husbands' home hours follows Calvo, Lindenlaub, and Reynoso (Forthcoming), who suggest that the production function shape is critical for joint labor decisions.

**Home Hours Requirement** I assume that each household is given a home hours requirement $T$ and they choose the allocation of $T_m$ and $T_f$. $T$ is heterogeneous across households, which reflects the fact that the amount of home hours differs based on the number of children and their age. In particular, I consider that $T$ is drawn from a cumulative distribution $F_T$.

# 4 Calibration

In this section, I describe the calibration strategies. All the parameters are determined by solving the model and matching a set of data targets.

## 4.1 Estimated Parameters

It is assumed that occupational specific productivity levels $(a_{m,R}, a_{m,NR}, a_{f,R}, a_{f,NR})$ are drawn from a multivariate log-normal distribution. I assume that there is no asymmetry between husband and wife in the mean of the market productivity for regular and non-regular jobs. I also assume that the correlations between regular and non-regular job productivity is gender neutral, i.e.,

$$\begin{aligned}
\mu_{a_{m,R}} &= \mu_{a_{f,R}} = \mu_{a_R}, \\
\mu_{a_{m,NR}} &= \mu_{a_{f,NR}} = \mu_{a_{NR}}, \\
\sigma^2_{a_{m,R}} &= \sigma^2_{a_{f,R}} = \sigma^2_{a_R}, \\
\sigma^2_{a_{m,NR}} &= \sigma^2_{a_{f,NR}} = \sigma^2_{a_{NR}},
\end{aligned}$$

and

$$\rho_{a_{m,R},a_{m,NR}} = \rho_{a_{f,R},a_{f,NR}} = \rho_{a_R,a_{NR}}.$$

This means that gender gaps in the model are endogenously generated by household choices. Furthermore, the mean of the ability for regular work is normalized to 1, i.e., $\mu_{a_R} = 0$.

Finally, to reduce the number of parameters, I make three additional assumptions. First, the variances of productivity for regular and non-regular jobs are the same, $\sigma^2_R = \sigma^2_{NR} = \sigma^2$. Second, the correlation of productivity for regular jobs between spouses is the same as the correlation of productivity for non-regular jobs between spouses ($\rho_{a_{m,R},a_{f,R}} = \rho_{a_{m,NR},a_{f,NR}} = \rho_{mf}$). Third, the cross-occupational gender correlation holds the independence condition, i.e., $\rho_{a_{m,R},a_{f,NR}} = \rho_{a_{m,NR},a_{f,R}} = \rho_{R,NR}\rho_{mf}$.

Based on these assumptions, the productivity levels of a couple are drawn from:

$$\begin{pmatrix} a_{m,R} \\ a_{f,R} \\ a_{m,NR} \\ a_{f,NR} \end{pmatrix} \sim \log \mathcal{N}\left( \begin{pmatrix} 0 \\ 0 \\ \mu_{NR} \\ \mu_{NR} \end{pmatrix}, \begin{pmatrix} \sigma^2 & \rho_{mf}\sigma^2 & \rho_{R,NR}\sigma^2 & \rho_{R,NR}\rho_{mf}\sigma^2 \\ \cdot & \sigma^2 & \rho_{R,NR}\rho_{mf}\sigma^2 & \rho_{R,NR}\sigma^2 \\ \cdot & \cdot & \sigma^2 & \rho_{mf}\sigma^2 \\ \cdot & \cdot & \cdot & \sigma^2 \end{pmatrix} \right)$$

I also assume that the share parameters $\nu$ and utility cost $\delta$ are heterogeneous across couples, and distributed according to

$$\nu \sim Beta(\alpha_\nu, \beta_\nu),$$

and

$$\delta \sim Gamma(\alpha_\delta, \beta_\delta).$$

The home requirements $T = T_m + T_f$ also differs across couples according to

$$\frac{1}{2}T \sim Beta(\alpha_T, \beta_T).$$

This heterogeneity represents differences in home hours based on the number and age of children. Note that I chose these distributions based on the constraints on the parameters ($\nu \in [0,1]$, $\delta \in [0,\infty)$, and $T \in [0,2]$).

Given these functional assumptions, there are 15 parameters to be calibrated:

$$\{ \underbrace{\lambda_R, \lambda_{NR}, \theta,}_{\text{production function}} \underbrace{\mu_{NR}, \sigma^2, \rho_{R,NR}, \rho_{mf},}_{\text{productivity}} \underbrace{\gamma, \xi, \alpha_\nu, \beta_\nu,}_{\text{joint leisure}} \underbrace{\alpha_T, \beta_T,}_{\text{home hours}} \underbrace{\alpha_\delta, \beta_\delta}_{\text{social norm}} \}$$

### 4.2 Moments

The table Table 1 displays the selected target moments and their corresponding values computed from the data in the fourth column. Although all parameters in the model have an impact on all the targets, the table highlights the target that is most influenced by each specific parameter.

Since $\lambda_R$ and $\lambda_{NR}$ directly affect the choice of working hours, the mean of working hours is targeted. Similarly, $\theta$ and $\nu_{NR}$ relate to occupational choices, and I choose the share of each occupation as a target. The targets, the standard deviation of log wages of female regular workers, the difference in the mean of log wages between female regular and non-regular workers, and the correlation of log wages of both-regular-worker couples are respectively connected to the productivities' variance and covariance matrix parameter $\sigma$, $\rho_{R,NR}$, and $\rho_{m,f}$. The standard deviation of working hours is also targeted to capture the joint leisure decision and its parameters $\gamma$ and $\xi$. To discipline parameters that determine heterogeneity across couples in home time requirements, $\alpha_T$ and $\beta_T$, and in the share of males in joint leisure, $\alpha_\nu$ and $\beta_\nu$, I use total hours in housework and leisure by each gender in the data.

The market outcomes of males are not targeted. As a result, the gender gaps produced by the model are not targeted and come from the asymmetric model components of the model, i.e., the share parameter $\nu$ and social norm $\delta$.

## 5 Baseline Economy

### 5.1 Parameters

The second column in Table 1 shows the estimated parameter values. By comparing the fourth and the fifth columns, which are the moments in the data and the model, we can see that the model matches all the targets reasonably well. The share parameter of joint leisure function $\nu$ has the mean 0.92 > 0.5 ($\alpha_\nu$ = 13.04 and $\beta_\nu$ = 1.15.) It implies that husbands weigh more on leisure, and they might not spend more on home production given longer working hours than wives. The requirement of home hours has the mean 0.62 ($\alpha_T$ = 1.59 and $\beta_T$ = 3.57), which corresponds to 50 hours per week.

**Table 1:** Calibration Results of Baseline Model

| Parameters | Value | Target | Data | Model |
|---|---|---|---|---|
| $\lambda_R$ | 0.57 | mean of $h_f$ for regular workers | 0.50 | 0.48 |
| $\lambda_{NR}$ | 0.63 | mean of $h_f$ for non-regular workers | 0.30 | 0.27 |
| $\theta$ | 2.96 | share of regular workers, females | 0.32 | 0.37 |
| $\mu_{NR}$ | -3.15 | share of non-regular wokers, females | 0.38 | 0.28 |
| $\sigma$ | 1.03 | $sd(\ln w_{f,R})$ | 0.72 | 0.72 |
| $\rho_{R,NR}$ | 0.14 | $\overline{\ln w_{f,R}} - \overline{\ln w_{f,NR}}$ | 0.62 | 0.62 |
| $\rho_{mf}$ | 0.01 | correlation of log wages, R and R couples | 0.49 | 0.50 |
| $\gamma$ | 0.84 | s.d. of $h_f$ for regular workers | 0.11 | 0.11 |
| $\xi$ | -8.29 | s.d. of $h_f$ for non-regular workers | 0.14 | 0.15 |
| $\alpha_v$ | 13.04 | mean of $T_m$ for regular workers | 0.14 | 0.13 |
| $\beta_v$ | 1.15 | mean of $T_m$ for non-regular workers | 0.13 | 0.14 |
| $\alpha_T$ | 1.59 | mean of $T_f$ for regular workers | 0.28 | 0.21 |
| $\beta_T$ | 3.57 | mean of $T_f$ for non-regular workers | 0.32 | 0.37 |
| $\alpha_\delta$ | 0.59 | share of couples with $e_m < e_f$ | 0.07 | 0.08 |
| $\beta_\delta$ | 11.81 | correlation of working hours, couples | 0.19 | 0.18 |

*Note:* The first and second columns show the estimated value of the model parameters. The third column is the calibration targets, and the fourth and fifth columns are their moment values in the data and the baseline model. The distance between these columns is minimized by the method of simulated moments.

The elasticity of substitution of home production $\xi$ = -8.29 suggests that the leisure hours are strategic complements. Calvo, Lindenlaub, and Reynoso (Forthcoming) also find that the rest of the working hours are strategic complements in Germany. The production function convexity of regular workers $\theta$ = 2.96 captures the non-linear earnings of regular jobs. This is on the line with the aforementioned literature (Goldin (2014), Erosa et al. (2022)). The log-mean of productivity of non-regular jobs $\mu_{a_{NR}}$ = -3.15 mostly reflects the wage gap between regular and non-regular jobs.[9] The gender correlation in skills $\rho_{a_m,a_f}$ = 0.01 ≃ 0 implies that the model can generate assortative mating without underlying correlations in abilities. The positive correlation between productivity of regular and non-regular jobs $\rho_{R,NR}$ = 0.14 suggests that the two types of skills are related at a certain level.

## 5.2 Occupational Choices and Hours Worked

Next, I show how the model economy performs along dimensions that are not targeted in the calibration. In Table 2, I present the occupational choice matrix for husbands

9. One of the reasons why non-regular jobs pay less is that non-regular workers are less likely to have job training. According to JPSED, 40% (35%) of male (female) regular workers have additional opportunities for training given by their employers (off-the-job training), while 22% (22%) of male (female) non-regular workers have.

**Table 2:** Occupational Choice in Baseline Model

| | Wife | | |
|---|---|---|---|
| Husband | regular | non-regular | not-work |
| **Data** | | | |
| regular | 0.30 | 0.31 | 0.28 |
| non-regular | 0.01 | 0.06 | 0.02 |
| not-work | 0.01 | 0.01 | 0.00 |
| **Model** | | | |
| regular | 0.26 | 0.16 | 0.28 |
| non-regular | 0.05 | 0.11 | 0.06 |
| not-work | 0.06 | 0.02 | 0.00 |

*Note:* This table shows the occupational choice of husbands and wives. The rows are husbands' occupations and the columns are wives' occupations. Each number is the density of each combination of couples' occupational choices.

**Table 3:** Allocation of Weekly Working Hours of Baseline Model

| | | Data | | Model | |
|---|---|---|---|---|---|
| Husband | Wife | Husband | Wife | Husband | Wife |
| regular | regular | 44.7 | 39.6 | 40.2 | 36.8 |
| regular | non-regular | 45.7 | 23.6 | 40.0 | 18.7 |
| non-regular | regular | 36.8 | 40.3 | 40.8 | 35.2 |
| non-regular | non-regular | 39.6 | 25.5 | 36.6 | 20.6 |

*Note:* The table shows the allocation of weekly working hours by couple's occupations. The first and second columns show the husband and wife's occupations. The rest of the columns show the corresponding working hours per week.

and wives. The rows are husbands' jobs and the columns are wives' jobs, and each cell represents the ratio of the combination of the couple's occupational choices to the total. Overall, the model explains the distribution of occupational well. However, more husbands work as non-regular workers in the model. It suggests that the inflexibility of regular jobs (convexity of their earnings) is excessive or the social norms on gender roles are insufficient.

Finally, I compare the time allocation of couples in each occupation in Table 3. The model captures well the characteristic patterns: First, husbands work longer than wives. Second, regular workers work longer than non-regular workers.

# 6 Gender Gaps

How do gender gaps in the model economy, which are not directly targeted, compare with the data? Table 4 shows the gender gaps in the aggregate economy. The first

**Table 4:** Gender Gaps in Baseline Model

| | Data | Model | Ratio |
|---|---|---|---|
| Participation | 0.27 | 0.27 | 99% |
| Occupation | 0.59 | 0.19 | 33% |
| Labor Hours | 0.49 | 0.36 | 74% |
| Wage | 0.76 | 0.26 | 34% |

*Note:* This table shows gender gap measurements and their values in data and model. The row "Participation" shows the difference in participation rate between males and females. The row of "Occupation" is the gap in the ratio of regular workers. The third and fourth rows are the gaps in log working hours and wages. The "Ratio" column shows the ratio of gaps in the model to the ones in the data.

column is the statistics from the data and the second column is the simulation results. The third column shows the ratio of the model to the data column. The first row, the gender gap in participation, means the difference in participation rates across genders. The second row, the gender gap in occupation, represents the difference between the share of regular workers. For example, the value 0.59 of the data, the column represents the difference in the ratio of regular workers (89 % for males and 32% for females.) The third and fourth rows are the gender gaps in log working hours and wages. One of the most interesting findings is that the model explains almost all (99%) of the gender gap in the participation rate. It is a consistent result with the social norm for wives' higher earnings. Women have the incentive to reduce their earnings (to zero) by quitting their jobs. In addition, the model explains a significant proportion (33%) of gender gaps in occupational choices, (74%) of working hours, and (34%) of gender gaps in wages.

# 7 Mechanisms

What accounts for the gender wage gap and part-time work in Japan? In the model, two factors play a key role in answering these questions: **job inflexibility** and **social norms**. As discussed in Section 2.4, Japan has relatively strong social norms on wives' earnings, and the job inflexibility of Japanese regular workers is high.

To this end, I run simulations with $\theta = 0.0$ and $\delta = 0.0$, fixing other parameters. Table 5 shows the comparison of occupational choices with the baseline model. If the wage schedule of the regular workers is linear ($\theta = 0.0$), the job inflexibility of the regular jobs gets eased. As a result, a large proportion of non-regular workers (not only female) work as regular workers. The proportion of dual-regular couples becomes twice larger (68 %) than the baseline (26 %). This is consistent with the fact that job inflexibility is one of the main reasons for women choosing non-regular jobs (Figure 6). Then, as Table 6 shows, all the gaps in occupational choices are eliminated. It leads to close the gender wage gap because the payment gap between regular and non-regular jobs is one of the main causes of the gender wage gap.

When social norms do not exist, $\delta = 0.0$, the gender gap in participation is eliminated and the gap in labor hours shrinks as 46% of the baseline. In other words, the

**Table 5:** Comparison in Occupational Choice

| | Wife | | |
|---|---|---|---|
| Husband | regular | non-regular | not-work |
| **Baseline** | | | |
| regular | 0.26 | 0.16 | 0.28 |
| non-regular | 0.05 | 0.11 | 0.06 |
| not-work | 0.06 | 0.02 | 0.00 |
| $\theta = 0.0$ | | | |
| regular | 0.68 | 0.02 | 0.21 |
| non-regular | 0.02 | 0.00 | 0.00 |
| not-work | 0.07 | 0.00 | 0.00 |
| $\delta = 0.0$ | | | |
| regular | 0.21 | 0.08 | 0.25 |
| non-regular | 0.03 | 0.04 | 0.06 |
| not-work | 0.23 | 0.10 | 0.00 |

*Note:* This table shows the fraction of each combination of couples' occupations. The first panel shows the results of the baseline model. The second and the third panel is the simulation results of setting $\theta = 0.0$ and $\delta = 0.0$, fixing other parameters.

**Table 6:** Comparison in Gender Gaps

| | Baseline | $\theta = 0.0$ | $\delta = 0.0$ | Remaining Gap $\theta$ | Remaining Gap $\delta$ |
|---|---|---|---|---|---|
| Participation | 0.27 | 0.14 | -0.04 | 52% | -14% |
| Occupation | 0.19 | 0.01 | 0.18 | 6% | 94% |
| Labor Hours | 0.36 | 0.64 | 0.17 | 175% | 46% |
| Wage | 0.26 | -0.03 | 0.22 | -10% | 86% |

*Note:* This table shows gender gaps measurements for baseline, $\theta = 0.0$, and $\delta = 0.0$ cases. The fourth (fifth) column is the ratio of values of $\theta = 0.0$ ($\delta = 0.0$) to the baseline. It tells the fraction of gaps that are not explained by $\theta$ ($\delta$).

social norm $\delta$ is strongly related to **intensive** and **extensive** margin. Interestingly, the last panel of Table 5 shows that this change comes from both husband and wife. Without social norms, 23% of couples are a couple of which the husband does not work and his wife works as a regular worker. It means that the elimination of social norms encourages women to work as regular workers and also allows men to choose not to work.

# 8 Outsourcing of Housework

Available evidence suggests that outsourcing housework could increase women's labor supply (e.g., Halldén and Stenberg 2014; Raz-Yurovich and Marx 2019), and low-skilled international migration can be a factor (e.g., Cortés and Tessada 2011; Barone and Mocetti 2011; Farré, González, and Ortega 2011). However, these external housework services are rarely used in Japan. According to the Family Income and Expenditure Survey 2021 of the Japanese Statistics Bureau, households of two or more persons pay only 6.6 euros per *year*.[10] It is also true that Japan has a restrictive policy on immigration.

Suppose households could purchase household services in the market in Japan. How would this affect gender gaps? To answer this question, I extend the baseline model as follows.

$$\max_{h_m,h_f,T_m,T_f,t,j_m,j_f} U = \ln c + \gamma \ln H(1 - h_m - T_m, 1 - h_f - T_f) - \delta I\{e_m < e_f\},$$

subject to

$$c + pt = e_m(h_m, a_{m,j}, j_m) + e_f(h_f, a_{f,j}, j_f),$$

and

$$T = T_m + T_f + t.$$

where $t$ is purchasable housework hours, and $p$ is its price. This model allows couples to buy outside household labor services and to satisfy the home hours constraints. In other words, it encourages high-skilled men and women to work more in the labor workforce.

Given the scarcity of house services, we can consider that the price of external housework, $p$, in the benchmark economy is too expensive in Japan so $t = 0$. Then, I conduct a simulation of the case where the price of housework services is affordable. In particular, I set its price as the median wage of a non-regular job in the benchmark economy ($p = \exp(\mu_{NR})$). I here assume that the housework services is a non-regular job. The rest of the parameters are fixed at the calibration of the baseline model.

Table 7 compares the choice of working hours and home hours. The existence of external housework services largely eliminates the need for couples to work for domestic labor. As a result, women can work more hours. For example, wives with regular jobs of husbands with regular jobs increase working hours by 5%.

10. I use the category "540 Housekeeping services".

**Table 7:** Working and Home Hours with Outsourcing $t$

| | | Baseline | | Outsourcing | |
|---|---|---|---|---|---|
| Husband | Wife | Husband | Wife | Husband | Wife |
| **Working Hours** | | | | | |
| regular | regular | 40.2 | 36.8 | 40.2 | 38.6 |
| regular | non-regular | 40.0 | 18.7 | 40.0 | 34.8 |
| non-regular | regular | 40.8 | 35.2 | 33.8 | 40.6 |
| non-regular | non-regular | 36.6 | 20.6 | 39.4 | 30.8 |
| **Home Hours** | | | | | |
| regular | regular | 9.4 | 19.8 | 0.4 | 1.8 |
| regular | non-regular | 4.2 | 29.7 | 0.0 | 3.9 |
| non-regular | regular | 6.7 | 19.2 | 0.8 | 1.6 |
| non-regular | non-regular | 11.8 | 32.7 | 0.1 | 2.5 |

*Note:* This table shows weekly labor working hours (upper panel) and home hours (lower panel) by couple's occupations.

**Table 8:** Gender Gaps with Outsourcing $t$

| | Baseline | Outsourcing | Remained Gap |
|---|---|---|---|
| Participation | 0.27 | -0.02 | -7% |
| Occupation | 0.19 | 0.03 | 15% |
| Labor Hours | 0.36 | 0.06 | 17% |
| Wage | 0.26 | 0.25 | 97% |

*Note:* This table shows gender gap measurements for the baseline model and the case when external housework services are available. The last column is the ratio of the values of the outsourcing case to the baseline. It tells the fraction of gaps in the baseline that remains when external housework is available.

Table 8 shows the remaining gender gaps under external housework services. It eliminates all the gender gaps in participation and significant proportions in occupational choices (85%) and labor hours (83%). This is a consistent result of the fact that housework is one of the main reasons for women choosing non-regular jobs in Figure 6. On the other hand, almost all the gender gap in wages remains.

Since this model just allows couples to outsource their housework, it still contains the two principal factors of the gender gaps: **job inflexibility** and **social norms**. The decrease in gender gaps in working hours and occupational choices suggests that job inflexibility matters only when they have a large housework requirement. Hence, external housework services can alleviate that constraint. However, the social norms on wives' earnings directly widen the wage gaps, and outsourcing housework cannot mitigate it.

# 9 Conclusion

In this paper, I build a model that can accounts for the gender gaps in participation rates, occupational choices, working hours, and wages in Japan. The key ingredients of the model are the inflexibility of working hours and social norms. The baseline model is simple and explains almost all of the gender gaps in participation rates, 33% in occupational choices, 74% in labor hours, and 34% in wages. In addition, the distribution of occupational choices is well-replicated.

I also disentangle the mechanism of why the gender gap is high in Japan. The simulation results show that the job inflexibility of regular jobs discourages women from having regular jobs, which provide higher wages. The social norms on wives' earnings reduce women's labor force participation and their working hours (extensive and intensive margin). In addition, cheap external housework services can relax the time constraints of couples and significantly reduce gaps in participation, occupation, and hours worked, which come from the inflexibility of regular jobs.

There are some possible extensions for future work. For example, Doepke and Kindermann (2019) considers that males and females are bargaining for fertility and household hours. We can consider an economy where husbands and wives are bargainings instead of maximizing their joint utilities. In addition, we can expand a model to a lifecycle setting. Xiao (2020) builds a model that captures human capital accumulation, preference for job amenities, and employers' statistical discrimination in wage offers and hiring. Lifecycle modeling enables us to clarify the relationship between the gender gaps and the difference in life events between men and women.

# Appendix

## A Data Description

The analysis is mostly based on the Japan Panel Study of Employment Dynamics (JPSED) and Survey on Dual-Income Couples' Household Economy and Attitudes (SDICHEA), 2014.[11]

JPSED is a panel data since 2016, with the most recent wave from 2020. The sample of JPSED2016 is 49,131 men and women older than 15 in Japan. The sample has increased to 57,284 in JPSED2020 with some attrition and addition. This survey has information on earnings, working hours, types of jobs, spouse's job, and spouse's earnings. To calculate the targets for the calibration, I use the pooled data from JPSED2016 to JPSED2020 and restrict the sample to individuals aged between 25 and 59, married, and employed (not self-employed or executive officer.)

The sample of SDICHEA is 2,200 dual-earner couples in the Greater Tokyo Area, aged from 35 to 49 for females and from 30 to 55 for males. This is a one-year survey in 2014 and has information on earnings, working hours, and types of jobs. Since the sample consists of couples where both of them work, they may differ from the whole sample of JPSED, which is a random sample of the whole Japanese population of working ages. However, this is not a major issue because I used SDICHEA only for the gender correlation of working hours and log wages for dual-earner couples.

Table 9 and Table 10 show the sample statistics for JPSED and SDICHEA. While most of the values are similar in these two data sets, one difference is in the ratio of non-regular to regular workers in the female. In SDICHEA, 35.1% of females are regular workers and 61.4% are non-regular workers, while in JPSED, the percentages are 33.7% and 37.6%. The difference might suggest that the gender correlations between working hours and wages are potentially biased.

## B Robustness Check

### B.1 Specifications of Discontinuity of Relative Earnings

Figure 7 indicates the gap in the density of share of earnings between husbands and wives. While this graph simply shows the discontinuous behavior of couples in terms of earnings, the 5% binning may be too coarse. I thus conduct the same analysis with 1% binning and non-parametric estimation of Cattaneo, Jansson, and Ma (2020). In Figure 12, we can see discontinuity at 50% of the share of earnings in both specifications. We can also see the mass point at 50% in the 1% binning specification, and the density at exactly 50% is 0.077. The existence of the mass point at 50% is also consistent with the model settings. The utility cost is imposed when a wife earns strictly more than

11. "Japanese Panel Study of Employment Dynamics, Recruit Works Institute" and "Survey on Dual-Income Couples' Household Economy and Attitudes, 2014, The Institute for Research on Household Economics" was provided by the Social Science Japan Data Archive, Center for Social Research and Data Archives, Institute of Social Science, The University of Tokyo. The description of the data can be found at https://ssjda.iss.u-tokyo.ac.jp/Direct/gaiyo.php?eid=1349 (JPSED) and https://ssjda.iss.u-tokyo.ac.jp/Direct/gaiyo.php?eid=1139 (SDICHEA).

**Table 9:** Data Summary of JPSED

| | | Male (N=88624) | | Female (N=82297) | |
|---|---|---|---|---|---|
| | | Mean | Std. Dev. | Mean | Std. Dev. |
| Age | | 40.9 | 9.5 | 42.4 | 9.9 |
| Working Hours | | 43.8 | 12.1 | 33.7 | 12.7 |
| Hourly Wage (JPY) | | 2573.1 | 4628.7 | 1593.8 | 3286.9 |
| | | N | Pct. | N | Pct. |
| Occupation | regular | 69902 | 78.9 | 27770 | 33.7 |
| | non-regular | 10812 | 12.2 | 30972 | 37.6 |
| | not-work | 7910 | 8.9 | 23555 | 28.6 |

*Notes:* Pooled Data from JPSED2016-2020.

**Table 10:** Data Summary of SDICHEA

| | | Male (N=2277) | | Female (N=2277) | |
|---|---|---|---|---|---|
| | | Mean | Std. Dev. | Mean | Std. Dev. |
| Age | | 43.5 | 5.3 | 41.6 | 3.9 |
| Working Hours | | 48.0 | 15.2 | 28.0 | 14.2 |
| Hourly Wage (JPY) | | 3250.3 | 3684.8 | 1755.9 | 4192.3 |
| | | N | Pct. | N | Pct. |
| Occupation | regular | 2062 | 90.6 | 799 | 35.1 |
| | non-regular | 202 | 8.9 | 1399 | 61.4 |
| | not-work | 13 | 0.6 | 79 | 3.5 |

*Notes*: Data from SDICHEA, 2014.

her husband, and they have an incentive to earn the same amount. You can also see Kuehnle, Oberfichtner, and Ostermann (2021) for a more detailed discussion about the mass point at 50% of the share of earnings and the specification of the discontinuity.

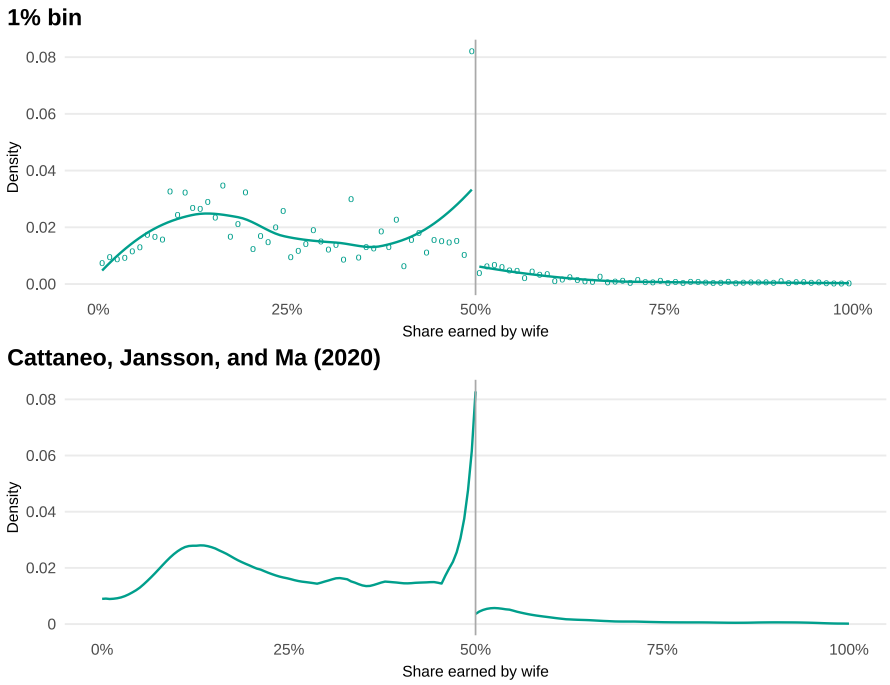


**Figure 12: Distribution of Relative Earnings.** The samples are the same as Figure 7. The above graph shows the density of the share of earnings between husbands and wives with 1% binning, and the below graph shows the non-parametric estimation of Cattaneo, Jansson, and Ma (2020).

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