



JAPAN

SELECTED ISSUES

May 2024

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April 15, 2024

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WHY SUCH FEW WOMEN IN LEADERSHIP POSITIONS IN JAPAN?¹

A. Introduction

1. More gender diversity in leadership and management positions is associated with higher productivity, inclusivity, stability, and firm profitability. More gender-balanced boards improve a firm's performance, such as funding obtained, revenues, and profitability due to different risk tolerance and skills brought by men and women, respectively (Peterson Institute for International Economics, 2016; Kim and Starks, 2016). Gender wage gaps are also smaller when there is a higher share of female managers (Theodoropoulos and others, 2022). Moreover, greater representation of women in politics and government organizations has been associated with positive policy outcomes, such as an increase of investment in health and education (Comunale and others, 2023; Hessami and Lopes da Fonseca, 2020).

2. Yet female representation in leadership positions and senior management roles in Japan is among the lowest globally, in both the public and private sectors. While Japan has made considerable progress in achieving higher female employment in the last decade, more than half of women still work in non-regular jobs (that is, part-time and fixed-term with lower wages, job security and skill development) and are severely underrepresented in managerial roles. Lack of women role models can further reinforce negative gender stereotypes, thus creating a self-fulfilling cycle of persistent gender gaps in Japan's labor market.²

3. This paper analyzes the main drivers of persistent gender gaps in leadership in Japan and identifies public policies that can play a role in closing these gaps. Japanese companies with a greater ratio of female managers to total female employees are found to have higher levels of productivity (Nishihata and Yamamoto, 2021), and tend to achieve higher return on equity and return on assets (Ito and Monoe, 2016). Despite its economic relevance, analysis on the drivers of women leaders and managers in Japan is limited. There are a few existing studies, such as Yamaguchi (2013), that use firm-level or survey-based data to identify the key constraints to women's career advancement. These are insightful, but analysis tends to focus on career-related indicators (such as working hours) and does not investigate the linkage with policy change and socio-economic factors. We use both a standard OLS and Structural Vector Autoregression (SVAR) models for our empirical analysis, taking into account various factors that could potentially be playing a role.

¹ Prepared by Kohei Asao (APD), Purva Khera (APD) and Mahima Vasishth (Bocconi University).

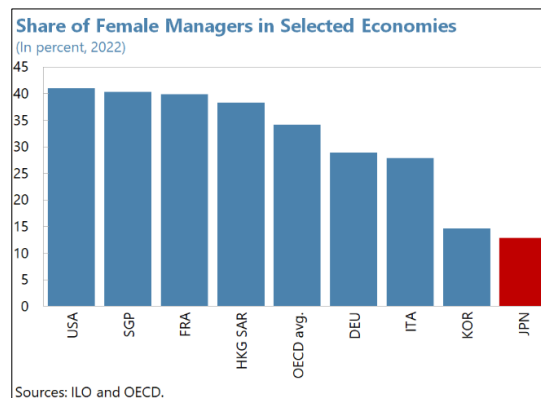
² There is also some [evidence](#) that indicates a multiplier effect among women leaders in the financial services industry, i.e., for every woman added to the leadership of an organization, many other women are inspired to rise to senior leadership roles.

B. Women Leaders and Gender Gaps: Recent Developments

4. Female labor force participation and employment have notably increased in recent years. Japan's female labor-force participation rate (15-64 years old) has been rising steadily in the past four decades, but experienced a notable acceleration from 2012 onwards. The rate surged to 74 percent in 2022 from 63 percent in 2012, while the male labor force participation increased from 84 percent to 87 percent during the same period. The rise in female labor force participation has contributed to the growth of the total labor force in Japan, despite the decline in the total population since 2010, particularly in service industries.

5. However, a majority of women still work in non-regular jobs. As of 2021, 54 percent of female employment is in non-regular jobs with lower wages, poor job security, limited training, and inadequate career advancement opportunities which limits their opportunities for senior managerial roles. The ratio is significantly higher than the 22 percent of male employment in non-regular jobs. In 2021, among the 25-54 age group, there were 4.9 times more women employed in part-time positions than men, while the OECD average stood at 3.6. Japan's gender wage gap of 22 percent (the difference between median earnings of men and women relative to median earnings of men) is 86 percent higher than the OECD average and was the highest among G7 countries in 2021. While men work 29 percent more hours than women in Japan, Hara (2023) shows that the gender wage gap is significantly larger than what can be explained by gender differences in human capital and working hours.

6. Only few women occupy leadership positions in the private and public sectors. While there has been some improvement, the proportion of female workers in managerial roles in the private sector is 13 percent, significantly below the OECD average of 34 percent and the target of 18 percent set by the government. The female managers in the private sector are particularly limited in large corporates. Moreover, the [Tokyo Shoko Research survey](#) shows that only 15 percent of all firms in Japan are owned by women.

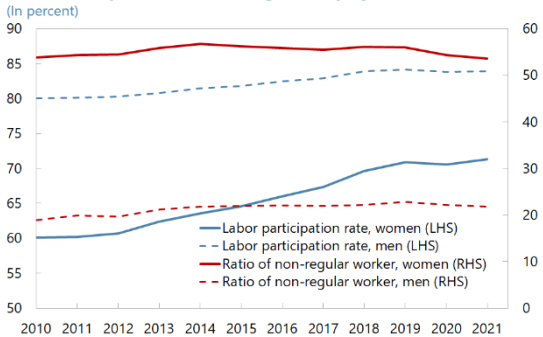


7. Women are also underrepresented in policy-making positions. In the national parliament, the percentage of women in parliament (lower house) is 10 percent with Japan ranking 164th globally. The percentage of women in the upper house is higher at 25.8 percent. In local parliaments, the percentage stands at 15 percent, and the ratio is even lower in rural areas.

Figure 1. Japan: Gender Gaps

Female labor force participation has risen significantly, but a large share are employed as non-regular workers...

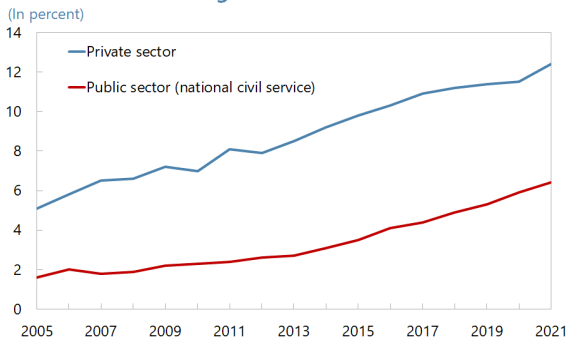
Labor Participation and Non-Regular Employment



Source: MHLW.

While the share of female managers has increased over time...

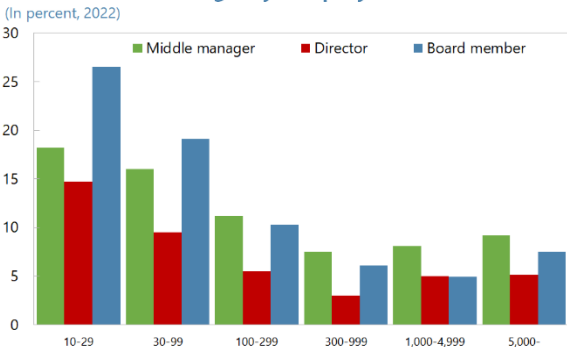
Share of Female Managers



Source: CAS, MHLW. Note: Share of kacho in private sector and honsho-kashitcho in public sector.

The share of female managers is lower in larger corporates.

Share of Female Manager by Company Size

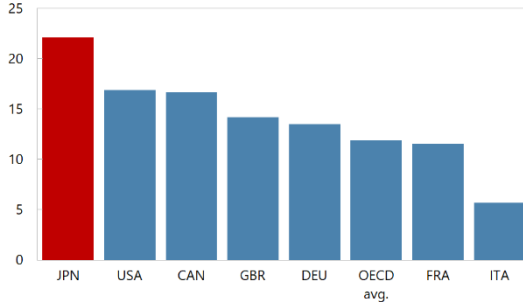


Source: MHLW.

...leading to the widest gender gap in wages among peer economies.

Gender Wage Gap

(In percent, difference between median earnings of men and women relative to median earnings of men, 2021)

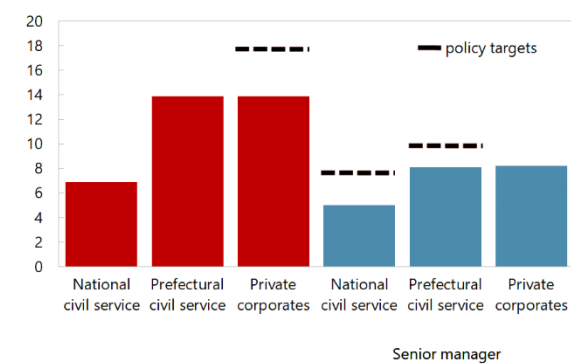


Source: OECD.

...it still remains low and far below the government's targets.

Share of Women in Managerial Roles vs. Policy Targets

(In percent, 2022)

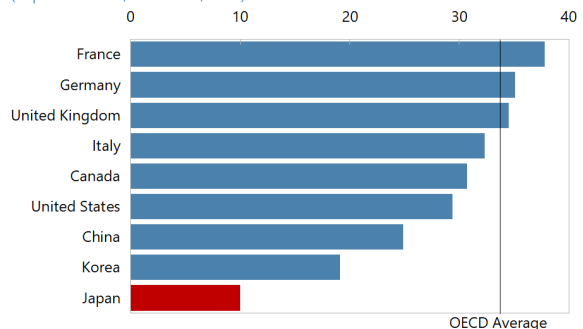


Sources: MHLW and CAS.

Representation of women in policy-making positions is also lagging.

Share of Parliamentary Seats in Single or Lower Chamber Held by Women

(In percent share, as of Jan 1, 2023)



Source: Inter-Parliament Union.

C. Empirical Analysis: Key Drivers of Gender Gaps in Leadership

The Annex lays out the empirical strategy and Annex Table 2 discusses the underlying data. Annex Table 1 reports the results of the OLS estimation and Figure 3 shows the impulse responses from the SVAR model. The latter approach complements the OLS analysis by assessing the impact of each variable even in the presence of strong correlation.

Results suggest that reducing the large gender gaps in homecare and the quality of employment, and further increasing the availability of public childcare facilities will promote higher share of female managers in the private sector.

Setting of policy targets by the government for achieving higher female representation in managerial roles is also found to be effective in leading to a structural shift towards the intended objective (Annex and para 12). A more detailed discussion is provided below.

Gender Gap in Home- and Family-Care

8. Large gender gaps in housework in Japan are found to be a significant hindrance to women's career growth. This is largely driven by:

- **Cultural norms.** There is a strong persistence of traditional division of labor in which the burden of childcare, elderly-care and household tasks is chiefly borne by women. Women do about 5 times the unpaid work/caregiving than men, while men do about 2 times the paid work than women.
- Limited paternity leave usage. Parental and childcare leave causes career disruptions for women in Japan, in contrast to men who typically continue working. This discrepancy in career continuity leads to an imbalance in career progression, making it challenging for women to attain managerial positions. Although men in Japan have access to up to one year and two months of paternity leave (one of the most generous in the OECD), there is very low take up. Only 17 percent of new fathers take paternity leave, in comparison to 80 percent of women in FY2022, and most take less than one month leave. The second most common reason (25.9 percent) cited for not taking paternity leave is attributed to "the company/supervisor's atmosphere discouraging paternity leave or a lack of understanding about it" (survey conducted by MHLW, 2020³). While the top reason refers to the lower wages during parental leave, [OECD data](#) shows that Japan's average payment rates for paternity leave is 61 percent, which is higher than the G7 average at 45 percent in 2022.⁴

³ Survey available in Japanese: <https://www.mhlw.go.jp/content/11900000/000791048.pdf>

⁴ In May 2023, Prime Minister Kishida announced to raise the effective parental leave payment rates to about 100 percent (if we include the effect of tax/social security premium exemption, otherwise about 80 percent) in the first 180 days if both parents take parental leave. The MHLW plans to implement this measure from FY2025.

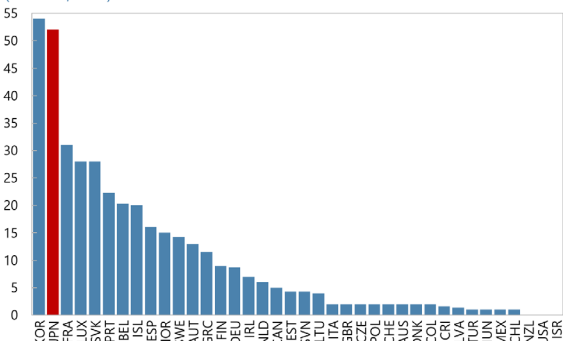
Figure 2. Japan: Gender Gap in Home- and Family-Care

Despite having one of the most generous paternal leave allowances...

...usage by men, although low in several countries, is severely underused in Japan.

Paid Family Leave Reserved for Fathers

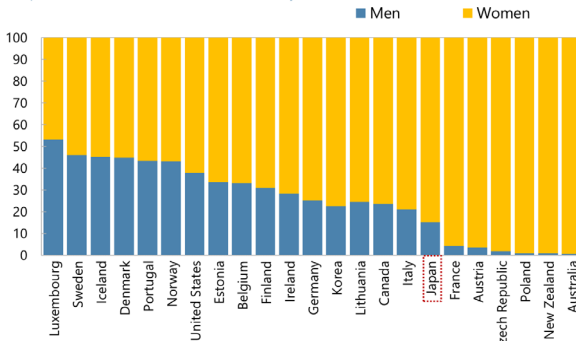
(In weeks, 2022)



Source: OECD.

Gender Distribution of Users of Parental Leave

(In percent share, 2021 or latest available year)

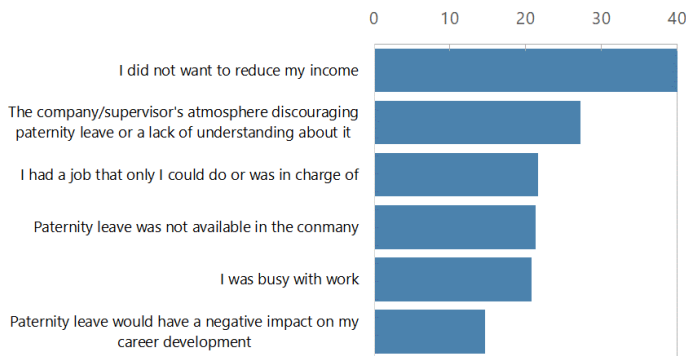


Source: OECD.

Cultural norms and fear of negatively impacting their career and income are the primary drivers of men not using paternity leave

Reasons Why Fathers under Regular Employment Take No Paternity Leave

(In percent, 2020)



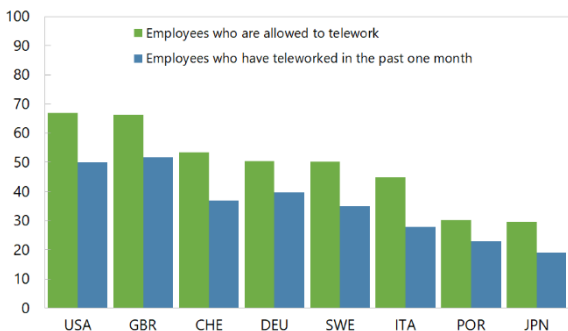
Source: JMA Research Institute (commissioned from MHLW). Note: Multiple answers allowed. Answers marked above 15 percents are listed. (n=409).

Teleworking is not as widespread, making work-life balance challenging...

...particularly for women due to their disproportionate share of the family care burden.

Share of Tele-working Employees by Country

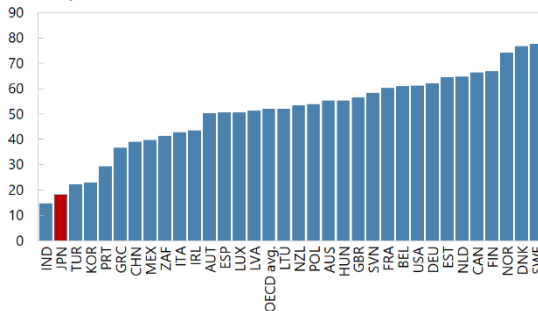
(In percent, July-August 2023)



Source: Nomura Research Institute.

Gender Gap in Unpaid Work

(In percent of time spent in unpaid work by men relative to by women, latest available year)

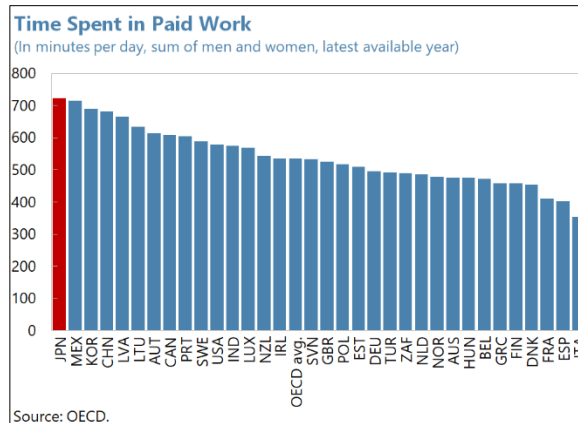


Source: OECD.

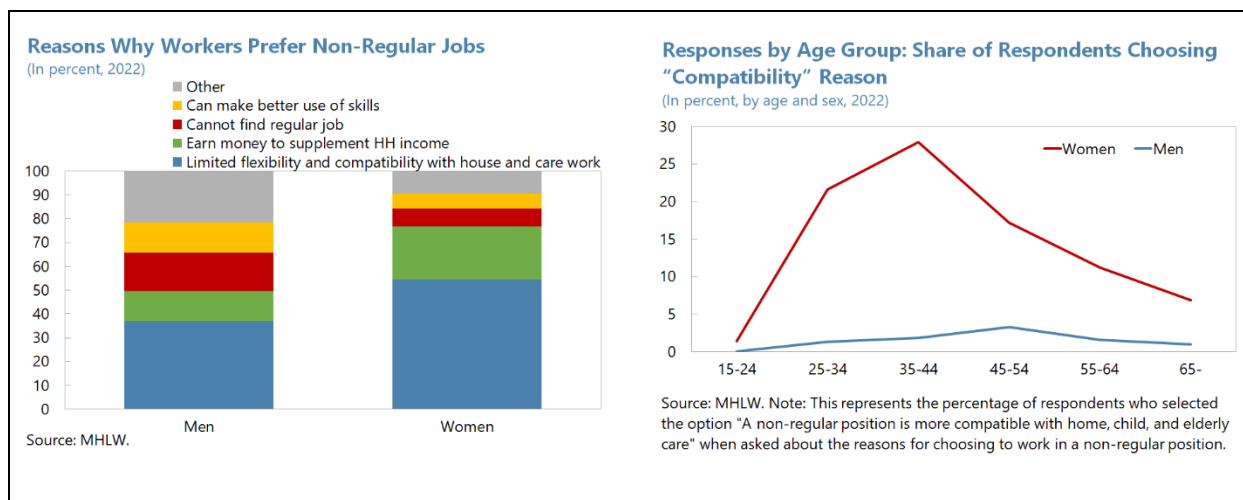
Gender Gap in the Quality of Employment

9. The gender gap in regular full-time employment is also found to negatively impact the share of female managers. This is driven by the following factors:

- The culture of long working hours in regular employment.** Japan ranks at the top among OECD economies in terms of the time spent in paid work. Consequently, women seeking to balance work and homecare responsibilities are often inclined to opt for part-time/non-regular employment. In fact, close to 30 percent of women mentioned “compatibility with household and care-related work” as the main reason for opting for non-regular employment in the age groups of 35-44.⁵



- Limited flexibility in working arrangements.** Low prevalence of telework and requirement of physical presence in the office constrains flexibility in working arrangements (e.g., low prevalence of flexible core working hour). A MHLW survey shows that only 8 percent of Japanese firms have adopted flexible time arrangements for work as of 2022. Yamaguchi (2013) shows that corporates that have better work-life balance tend to have higher female management. This is because enhanced flexibility in work arrangements enables more women, especially mothers, to expand their working hours and assume greater responsibilities.

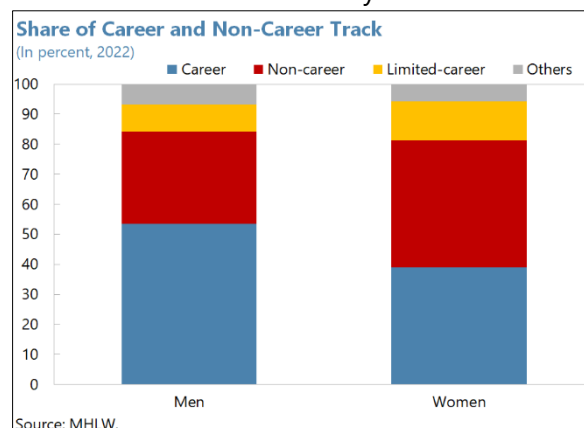


- Policy anomalies.** The distortions created by the current design of benefits in tax and social welfare system for second-income earners (for example, spousal deductions and exemption of pension contributions when income is below a certain threshold) is found to discourage women

⁵ According to a survey by Japan’s MHLW.

from increasing their working hours and hence choosing part-time non-regular employment, consequently restricting their career advancement opportunities (Xu and Chahande, 2023).⁶

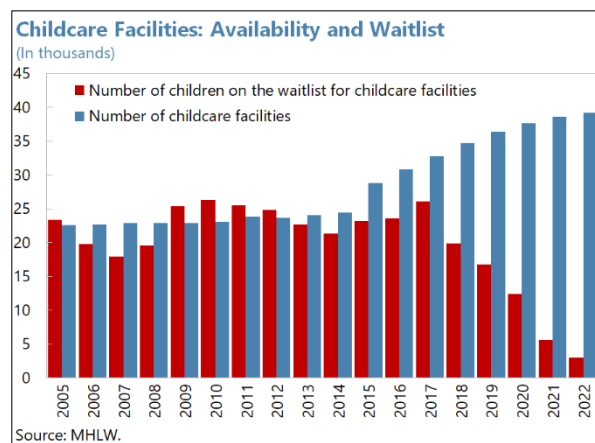
- **The career and non-career tracks systems.**⁷ While this is not a factor that directly obstructs women from obtaining regular employment, it significantly impedes their promotion even within the domain of regular employment. When employees join a company, they typically choose either the career track or the non-career (clerical) track, with limited mobility opportunities between the two. Although both tracks are open to women, men dominate the former, where there is greater opportunity for career advancement.



Childcare Facilities and Allowances

10. The availability of public childcare facilities has improved, and is positively associated with the share of female managers. Recent studies also find a positive relationship between women's economic participation and the provision of childcare facilities. [Asai and others \(2018\)](#) show that childcare facilities use increases mothers' labor supply and earnings in Japan, especially during the initial stages of childcare.

The number of waitlisted children for childcare services in Japan were large and increased by 19 percent from FY2007 to FY2014, while the number of childcare facilities rose only by 7 percent during the same period. The authorities started expanding the availability of childcare facilities in 2015 and strengthened the budget allocation in 2017 to eradicate the waitlist. Consequently, the number of childcare facilities increased by 36 percent from FY2015 to FY2022, and the number of waitlisted children declined significantly.



11. Childcare allowance, on the other hand, is found to not have a statistically significant impact on share of female managers.⁸ Initially introduced in 1972, the allowance amount varies

⁶ Against this background, the authorities have announced new subsidies aimed at eliminating the income discrepancy that arises when annual income exceeds 1.06 million JPY due to social security contributions.

⁷ We do not include this variable in our empirical analysis due to inadequate data availability. There is also 'limited career track' which has restrictions related to geographical working location and/or specific field of work.

⁸ Gender gap in education also does not exhibit a significant impact, given Japan's gender gap in tertiary education is limited.

based on the age and number of children and the income level.⁹ In the literature, there are divergent views about its impact on women’s labor market decisions. Though child allowances could support women’s work-life balance and incentives to work, too much support can adversely affect the incentives for women to enter the labor market (IMF, 2013).

D. Policy Recommendations

As witnessed in the case of Japan, increasing female labor force participation is not sufficient to ensure that women have good jobs and good careers. To foster the advancement of women into managerial and leadership positions, policy efforts need acceleration in the following areas:

12. While the government has set targets for representation of women in managerial roles, which is welcome, stricter enforcement and a broader coverage is found to be more effective. The Japanese government has set a target of having women occupy at least 30 percent of executive positions in private firms by 2030, modified from the initial target by 2020.¹⁰ However, this is only limited to TSE listed companies on the prime market which employ a very small share of Japan’s total labor force (less than 5 percent). These targets are also voluntary in nature, i.e., require firms to strengthen their own regulatory compliance with no strict penalties for not meeting these targets. OECD (2020) finds that countries that have adopted a mandatory quota have seen a more immediate increase in the number of women on boards and those that have taken a “softer” approach, using disclosure rules or targets, have seen a more gradual increase over time. The top five performer countries in women leaders (Finland, France, Italy, Norway, and Sweden) have all implemented mandatory quotas.¹¹

13. Reforming current employment practices and policies are essential for improving women’s quality of jobs. This will also help increase productivity, wages and advance a more equal society. First, further progress should be made on work-style reforms, such as encouraging the use of flexible working schedules and teleworking options. This would allow men and women to better share the responsibilities of housework and consequently encourage more women to work in regular employment. Second, linking promotions to merit instead of seniority and years of service will enable women to achieve better career advancement, even if their work commitment temporarily slows down due to family reasons. It will also encourage men to take childcare leave without worrying about jeopardizing their career advancement. Third, spousal benefits in tax and social security contributions should be rationalized to avoid disincentivizing women from increasing their labor supply. Fourth, the career track system should offer significantly increased flexibility,

⁹ Currently, the benefit amounts are: ¥15,000 per month per child under 3 years old; ¥10,000 per child or ¥15,000 for the third child and onwards per child from 3 years old until the child graduates from elementary school; and ¥10,000 per child for junior high school aged children. Moreover, the government has decided to abolish any household income level thresholds starting from 2024, thus making all households eligible for this allowance, to bolster fertility support.

¹⁰ Numerical targets are part of TSE listing rules and the government recommends that TSE listed companies create action plans for fulfilling these targets.

¹¹ Overall, 12 OECD countries have established mandatory quotas, including five (Denmark, Iceland, Norway, France, and Spain) requiring at least 40 percent participation of women on boards.

allowing women (and men) initially employed in non-career tracks the option to transition to career-track positions.

14. Raising usage of and introducing more flexibility in paternal leave is critical to promote work-life balance for both men and women. The government is trying to increase the share of men taking paternity leave to 85 percent by FY2030, modified from the initial target of 30 percent by FY2025.¹² Additional paternity leave incentives were introduced in October 2022, allowing fathers to take four weeks off in the first eight weeks post-childbirth with effective income substitution rate at 80 percent (100 percent from FY2025), with additional financial incentives if both parents take leave.¹³ While this may help partially, considering that cultural pressure and a lack of understanding is also a major reason for men not taking parental leave, encouraging a cultural shift is also essential. Recent measures that made it mandatory for employers to individually explain parental leave and relevant policies to employees with the aim of encouraging its adoption (April 2022), and the new requirement for companies to annually disclose the status of childcare leave taken (since April 2023 for companies with over 1,000 full-time employees) are welcome. For parents who may be unwilling or unable to stop work completely, flexible or part-time leave arrangements may provide a solution. Such arrangements can allow individuals to remain connected to their jobs while caring for children. Employers may benefit too: they may not have to incur the cost of finding and hiring a replacement worker if the employee is on leave only part-time (OECD, 2016). Some other countries, such as Spain and France, have made paternity leave “mandatory” which has proved to be favorable for women’s economic participation (Farré and González, 2017).

15. At the same time, further expanding childcare facilities supported by attracting foreign workers will help. While access to childcare facilities has indeed improved since 2015, it is worth noting that the waitlist numbers might be underrepresented since some children could be excluded from the statistics in certain cases.¹⁴ This suggests that there is a need for continuous efforts to further expand childcare facilities. The current bottleneck lies in the shortage of nursery teachers which is driven by their relatively low wages—the average monthly wage of a nursery teacher is 17 percent lower than an average full-time employee. The authorities should persist in their efforts to increase nursery teacher wages while also attract foreign workers to further help address these labor shortages.

16. Raising childcare allowance is unlikely to encourage women’s leadership. Changes in the childcare allowance have demonstrated limited impact on women’s career advancement, as well as on fertility rate (see *2024 Japan Article IV Selected Issues Paper “Japan’s Fertility: More Children Please”*). Social norms and deeply entrenched labor/employment practices are more fundamental drivers. Policy support should pivot from the current focus on strengthening financial assistance to addressing the structural issues mentioned.

¹² The authorities initially established the numerical target of 30 percent to be achieved by FY2025; however, in March 2023, the Prime Minister modified this target.

¹³ Women get 8 weeks off with nearly full income substitution.

¹⁴ For instance, children whose parents are on parental leave are excluded from the waitlist. This means that if parents are taking leave because they cannot find appropriate childcare facilities (parents can extend their parental leave beyond the standard one year to the maximum period of two years), these children will not be included in the waitlist count.

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Annex I. Empirical Analysis

To identify the drivers of gender gaps in managerial roles, the following OLS equation is estimated using available annual data on Japan from 2001-21:

$$female_managers_t = \alpha + \beta_0 Policy + \beta_i X_{i,t-1} + \varepsilon_t$$

where the share of female managers in the private sector is the dependent variable defined as the share of female middle (*kacho*)/senior (*bucho*) managers over all middle/senior managers. Following the literature, our regressors (X) include gender gap in homecare, gender gap in regular employment, gender gap in tertiary education, usage of childcare facilities, and the relative size of the childcare allowance (see Table 2 for the detail of each variable). We also include a policy dummy variable to take account of the structural shift after the 2013 introduction of the government's target of achieving a 30 percent female management ratio by 2020.

Table 1 below presents the results of the OLS regressions. While an OLS analysis is useful, it may suffer from endogeneity issues, with the direction of causality unclear. To tackle these issues:

- All regressors are lagged one period.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gender gap in homecare	-2.992*** (0.171)	-3.183*** (0.163)	-1.194** (0.446)	-3.166*** (0.215)	-1.799*** (0.349)	-2.432*** (0.158)	-1.534*** (0.371)	-1.555*** (0.381)	
Gender gap in regular employment		30.43** (11.07)	6.315 (9.221)	29.28* (14.79)	19.33** (7.275)	25.72*** (7.835)	9.869 (9.068)	14.11 (11.83)	-17.54 (12.78)
Childcare facilities			0.124*** (0.0269)		0.0542** (0.0255)		0.0658** (0.0253)	0.0454 (0.0437)	0.157*** (0.0489)
Childcare allowance				0.0452 (0.371)		0.155 (0.197)	0.285 (0.176)	0.298 (0.181)	0.612** (0.235)
Policy change dummy					1.026*** (0.246)	1.383*** (0.206)	0.978*** (0.236)	0.974*** (0.241)	0.559* (0.313)
Gender gap in tertiary education								3.734 (6.471)	1.278 (9.212)
Observations	21	21	21	21	21	21	21	21	21
R-squared	0.942	0.959	0.982	0.959	0.991	0.989	0.993	0.993	0.984

Standard errors are in parentheses. All regressions include a constant term.
*, **, *** denote statistical significance at the 1, 5 and 10 percent level.

- We complement the analysis with a SVAR model as it allows to study a more causal interpretation of the relationship between variables by isolating and identifying the direct impacts of specific exogenous shocks. This helps us assess the effects of each factor in the presence of strong correlation (Sims, 1980; Guo, 2013; Kinoshita and Guo, 2015). We use a non-recursive four-variable model with the following variables which are found to be statistically significant drivers in the OLS analysis: share of women managers, gender gap in regular work, gender gap in time spent in household work, and availability of childcare facilities.

We estimate a short-run recursive SVAR model (Sims, 1980) to identify the impulse response function, as follows:

$$A(IK - A_1L_1 - A_2L_2 - \dots - A_nL_n)y_t = A\epsilon_t = Be_t$$

where L is the lag operator; A , B , and A_1, \dots, A_n are $K \times K$ matrices of parameters; ϵ_t is a $K \times 1$ vector of errors with $\epsilon_t \sim N(0, \Sigma)$ and $E[\epsilon_t \epsilon'_s] = 0_K$ for all $s \neq t$; and e_t is a $K \times 1$ vector of orthogonalized disturbances; that is, $e_t \sim N(0, I_K)$ and $E[e_t e'_s] = 0_K$ for all $s \neq t$. The transformations of the errors allow us to analyze the dynamics of the system in terms of a change to a variable of e_t .

We identify this short-run SVAR model by placing restrictions on A and B , which are assumed to be nonsingular.

The above equation implies that:

$$P = A^{-1}B$$

Where P is the matrix identified by the model.

This implies:

$$A\epsilon_t\epsilon'_tA' = B\epsilon_t\epsilon'_tB'$$

Taking the expectation of both sides gives us:

$$\Sigma = PP'$$

Assuming that the underlying VAR is stable, we can invert the autoregressive representation of the above model to an infinite-order, moving-average representation of the form:

$$y_t = \mu + \sum_{s=0}^{\infty} \Phi_s e_{t-s}$$

where y_t is in terms of the mutually orthogonal, unit-variance structural errors e_t .

The Φ contain the structural IRFs at time period s . μ is a vector of constants.

In a short-run SVAR model, the A and B matrices model all the information about contemporaneous correlations. The B matrix scales the error u_t to have unit variance. This allows the interpretation of the structural IRFs as: the effect on variable i of a one-time unit increase in the structural error to variable j after s periods.

We define the matrices A and B as follows:

$$A = \begin{pmatrix} 1 & 0 & 0 & 0 \\ \cdot & 1 & 0 & 0 \\ \cdot & \cdot & 1 & 0 \\ \cdot & \cdot & \cdot & 1 \end{pmatrix}; \text{ and } B = \begin{pmatrix} \cdot & 0 & 0 & 0 \\ 0 & \cdot & 0 & 0 \\ 0 & 0 & \cdot & 0 \\ 0 & 0 & 0 & \cdot \end{pmatrix}$$

These matrices correspond to the following structural restrictions and contemporaneous relationships:

$$\begin{bmatrix} \epsilon_{\text{gender gap in household work}} \\ \epsilon_{\text{availability of childcare facilities}} \\ \epsilon_{\text{gender gap in regular work}} \\ \epsilon_{\text{share of women managers}} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 \\ a_{31} & a_{32} & 1 & 0 \\ a_{41} & a_{42} & a_{43} & 1 \end{bmatrix} \begin{bmatrix} \epsilon_{\text{gender gap in household work}} \\ \epsilon_{\text{availability of childcare facilities}} \\ \epsilon_{\text{gender gap in regular work}} \\ \epsilon_{\text{share of women managers}} \end{bmatrix}$$

The restrictions above are based on the empirical literature including our findings from the above OLS analysis: we assume that the share of women managers in Japan, at any point in time, is a function of the gender gap in time spent in unpaid household work (Dunatchik and Ozcan, 2021), the availability of childcare facilities (Dang, Hiraga and Nguyen, 2022), and the gender gap in regular work (Yamaguchi, 2019).

Figure 3 reports the impulse responses over a four-year horizon (red solid line), and the upper and lower dotted lines represent two standard confidence bands around the estimations that are constructed by Monte Carlo simulation. The vertical axis shows the percentage change in share of women leaders with the respective 1-unit shock over time. We find that the magnitude and the statistical significance of the estimated impulse responses are robust to alternative specifications and restrictions of the SVAR model.

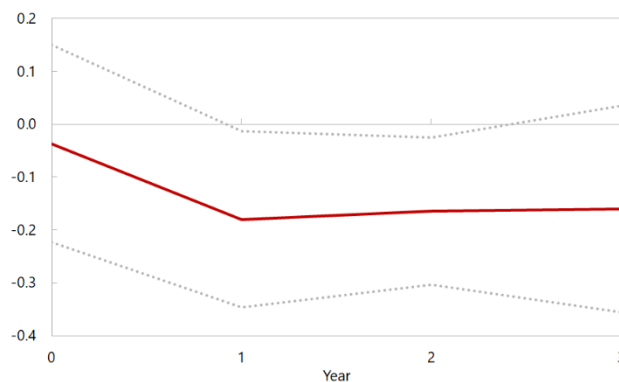
Results suggest that a 1 unit increase in the gender gap in house-work (i.e., if women spend 6 times as much time in house-work relative to men, up from 5) decreases the share of women leaders and has a relatively persistent impact. A 1 percentage point increase in the coverage of childcare facilities leads to an increase in the share of women leaders. Lastly, an increase in the relative regular employment of women vis-à-vis men also has a positive impact, although it is not statistically significant.

Figure AI.1. Japan: Impulse Responses of Share of Female Managers

An increase in the gender gap in unpaid work at home has a negative impact on the share of female managers

Unpaid Work at Home Shock

(In percentage point)

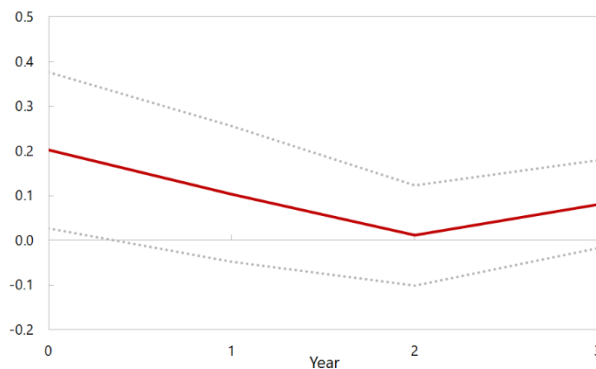


Source: IMF staff estimations. Note: The dotted lines show 95 percent confidence intervals.

An increase in childcare facilities has a positive impact on the share of female managers

Childcare Facilities Shock

(In percentage point)

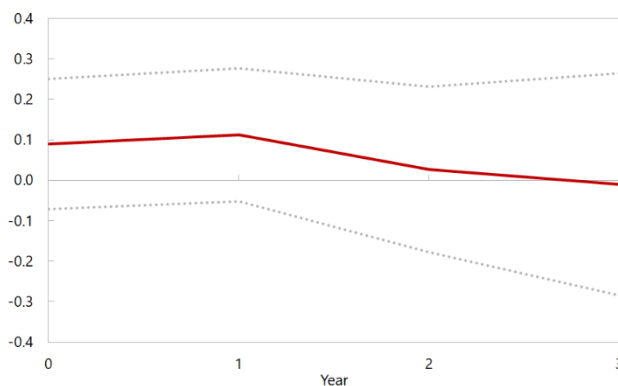


Source: IMF staff estimations. Note: The dotted lines show 95 percent confidence intervals.

A relative increase in women's regular employment vis-à-vis men increases the share of women in managerial positions

Regular Employment Shock

(In percentage point)



Source: IMF staff estimations. Note: The dotted lines show 95 percent confidence intervals.

Table A1.2. Japan: Data

<i>Variable</i>	<i>Description</i>	<i>Data source</i>
Share of female managers	This is the dependent variable which is defined as the share of female middle/senior managers over total middle/senior managers in the private sector. ¹	Ministry of Health, Labour and Welfare.
Gender gap in homecare	The difference between the time for household-related work per day by women and men, divided by the time for household-related work per day by men.	Ministry of Internal Affairs and Communications.
Gender gap in regular employment	The difference between proportion of regular employees among women and men, divided by the proportion of regular employees among men.	Ministry of Internal Affairs and Communications.
Gender gap in tertiary education	The difference in university enrollment rate among women and men, divided by the university enrollment rate among men.	Ministry of Education, Culture, Sports, Science and Technology.
Availability of childcare facilities	The ratio of children (1-2year old) using childcare facilities over total population of children in this age.	Ministry of Health, Labour and Welfare.
Child allowances	The ratio of child rearing allowances provided by the government to total social security benefits. ²	Japan's National Institute of Population and Social Security Research
Policy	A dummy variable that takes the value of 1 when the year is 2014 or later, and 0 otherwise. "Japan Revitalization Plan" released in June 2013 set a target aiming for a 30 percent share of managers to be females by 2020.	
<p>¹ Junior manager (section chief; <i>Kakaricho</i>) is not included since a section chief in Japan typically oversees only a few members, if any, and is not considered a managerial position in some cases.</p> <p>² The amount of total social security benefits is based on ILO standards, and other detail of the assumption follows the Financial Statistics of Social Security.</p>		

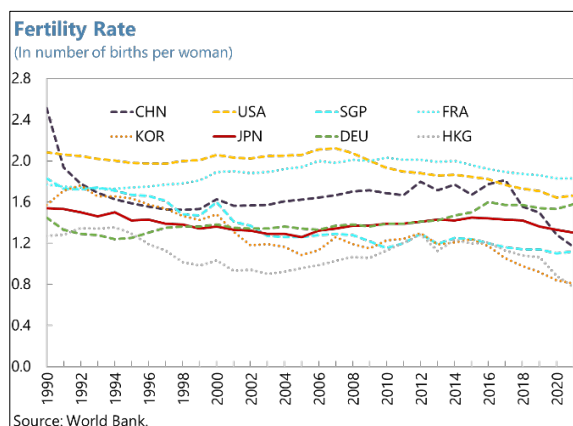
JAPAN'S FERTILITY: MORE CHILDREN PLEASE¹

Japan's fertility has declined in the past three decades. Raising Japan's fertility rate is a key policy priority for the government. Using cross-country analysis and case studies, this paper finds that the most successful measure to support the fertility rate is the provision of childcare facilities, particularly for children aged 0-2. Offering stronger incentives for the use of paternity leave can alleviate the burden of childcare on mothers, supporting fertility. On the other hand, there is limited evidence that cash transfers are effective in supporting fertility, based on international experience.

A. Introduction

1. Japan's fertility has been on a declining path since the 1990s, but has stabilized at a low level in the past decade.

The number of births reached a record low, while the fertility rate declined to about 1.26 in 2022. Japan's fertility rate is one of the lowest among G7 economies, but it remains higher than other East Asian advanced economies such as Korea, Hong Kong, and Singapore. Several reasons contributed to Japan's declining fertility rate, including later and fewer marriages, a high gender gap in unpaid housework, and the prevalence of women engaging in non-regular employment (contributing to a gender wage gap).



The increased availability of childcare facilities in the past decade, however, helped stabilize the fertility rate. Given a declining labor force due to an aging population, supporting fertility can help boost Japan's growth potential. At the same time, a higher fertility rate could help alleviate the pressure from growing public spending on healthcare and pensions.

2. The authorities have announced initiatives to raise Japan's fertility rate, a key policy priority under the Kishida administration. They formulated the "Children's Future Strategy" in 2023, aimed to increase children-related spending by 3.6 trillion yen (approximately 0.6 percent of GDP) per year by FY2028. Additionally, the government announced plans to double the budget allocation for the Children's Agency by early 2030s. The strategy also includes plans to promote co-parenting and to strengthen support for child-rearing households including expansion of childcare facilities.

3. Empirical and theoretical literature suggests that the policies that reduce education costs and opportunity costs for mothers to raise children have the most positive effect on fertility. Specifically, United Nations (2019, 2021) assess the effectiveness of policies to address low fertility globally and find that providing widely available, accessible, and high-quality childcare is

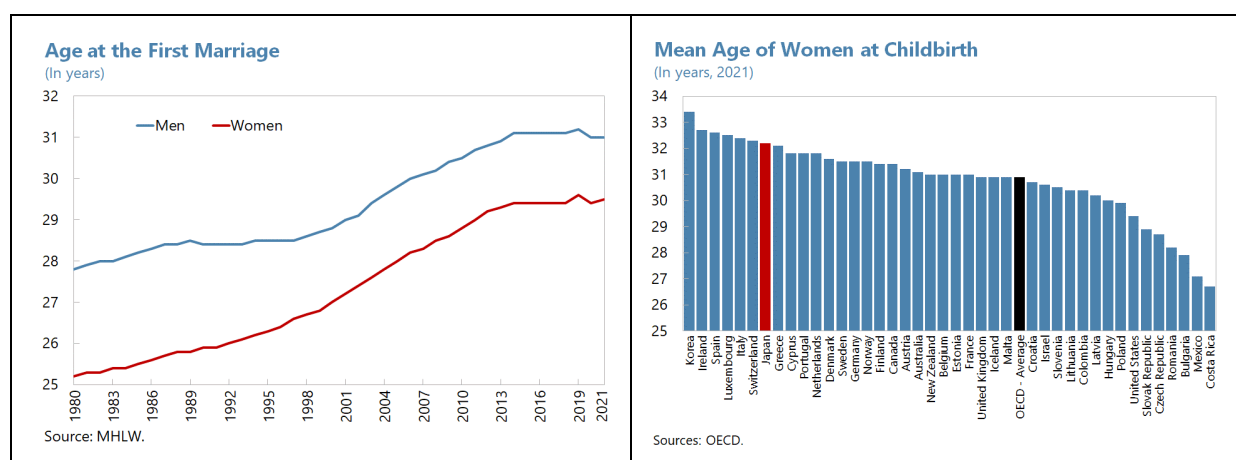
¹ Prepared by Kohei Asao, Danila Smirnov, and TengTeng Xu (all APD). We thank Yan Carrière-Swallow and seminar participants at the Ministry of Finance of Japan for useful comments and discussions.

indispensable to sustaining higher fertility rates. In the context of the United States, Coskun and Dalgic (2023) provide a comprehensive examination of fertility dynamics in relation to contemporary labor market shifts, revealing a substantial negative impact of increased female labor participation on fertility rates. Bringing the focus to Japan, IMF (2020) uses prefecture-level data to show that a lower wage gap between male and female workers, a reduction in education costs, and a rise in childcare facilities are associated with higher fertility.

4. This paper examines drivers of fertility based on cross-country regression analysis and case studies. Drawing on international experience, the most successful measure to support the fertility rate is the provision of childcare facilities, particularly for children aged 0-2. This policy is effective as it enhances parents' (particularly mothers') ability to continue to work during the early years of childhood as the scarring effect of 'lost' years on labor market outcomes is particularly high. Offering stronger incentives for the use of paternity leave can alleviate the burden on mothers. On the other hand, as discussed later, cash transfers do not have a significant impact on boosting the fertility rate.

B. Stylized Facts

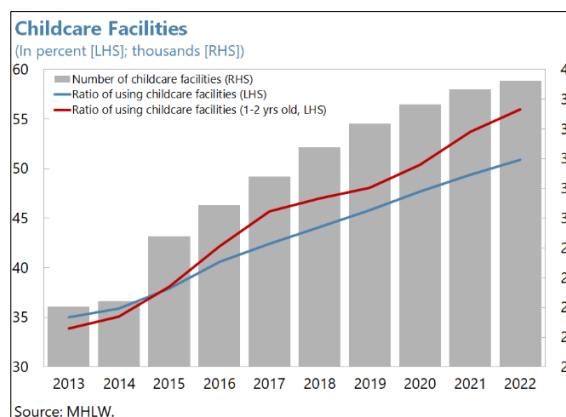
5. More Japanese are marrying later in life or remaining single, similar to other advanced economies. The average age at first marriage has increased gradually for both men and women in the past three decades, with more Japanese choosing to remain single. [The 2021 Annual Population and Social Security Survey by the National Institute of Population and Social Security Research \(IPSS\)](#) shows that the average number of children per married couple has remained relatively stable over the past four decades (2.19 in 1977 and 1.90 in 2021), indicating that the decline in the marriage rate has made a significant contribution to the declining fertility rate. In addition, the mean age of women at first childbirth in Japan is relatively high compared to peer economies. The IPSS survey also shows that the average number of children for women who married before 25 years old is 2.11, but this number decreases as the marriage age increases.² These facts suggest that later marriages and later childbirth also contribute to the decline in the fertility rate.



² It is 1.87 for women marrying between 25-29 years old, 1.61 for those marrying between 30-34 years old, and notably decreases to 1.03 for women marrying at 35 years old or more.

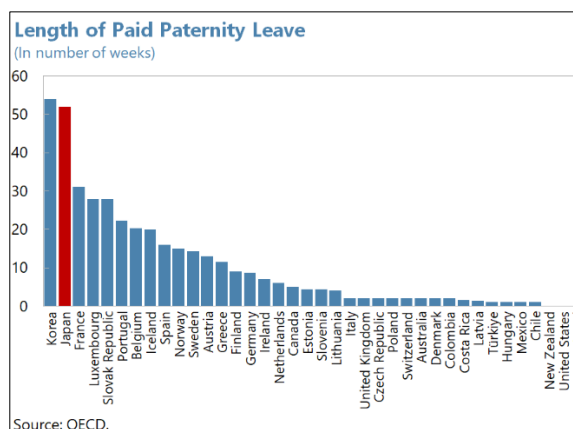
6. The expansion of childcare facilities may have helped stabilize Japan’s fertility rate in the past decade.

The number of childcare facilities increased by 63 percent, with the waitlisted children reducing by 87 percent from 2013 to 2022³. The usage of childcare facilities also rose gradually, but remains relatively low at 52 percent in 2023, below other advanced economies. The expansion of childcare facilities is considered an effective policy measure for increasing the fertility rate. Unayama (2023) estimated that the expansion of childcare facilities since 2005 has led to an increase in the total fertility rate by 0.1.



7. While Japan has one of the most generous parental leave systems, the uptake remains very low.

The length of paid paternity leave is about 50 weeks in Japan, with a replacement payout at 61 percent⁴ of salary, which is more generous than most peer economies. However, the average duration of paternity leave taken in 2022 was less than 6 weeks (about 41 days). Many fathers chose not to take paternity leave, with the bulk of childcare responsibilities falling on mothers. A 2020 MHLW survey revealed that 25.9 percent of fathers who did not take paternity leave attributed their decision to “the company/supervisor’s atmosphere discouraging paternity leave or a lack of understanding about it”.

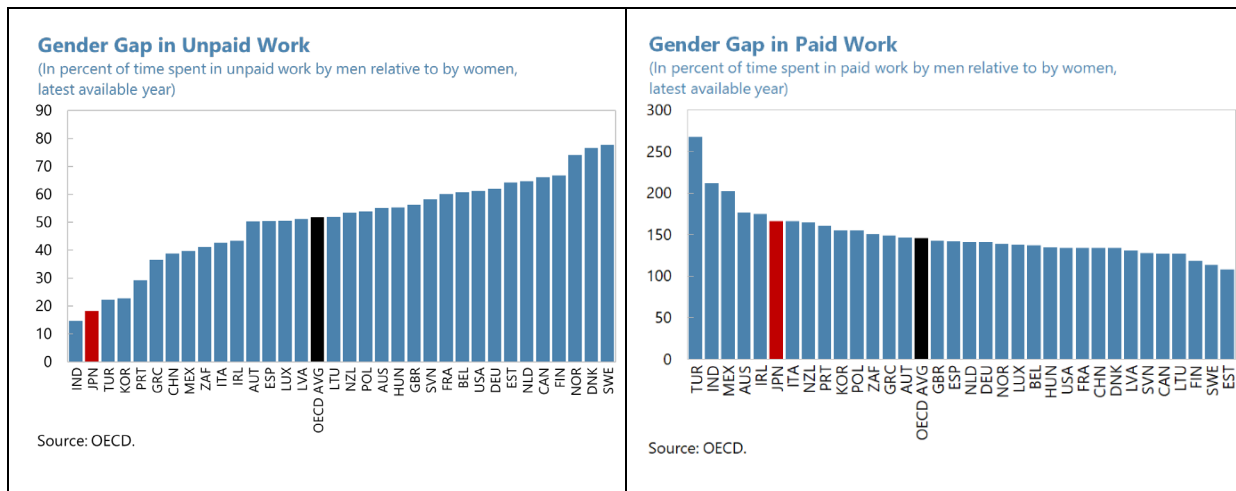


8. The gender gap between men and women in unpaid housework in Japan is one of the largest among OECD countries.

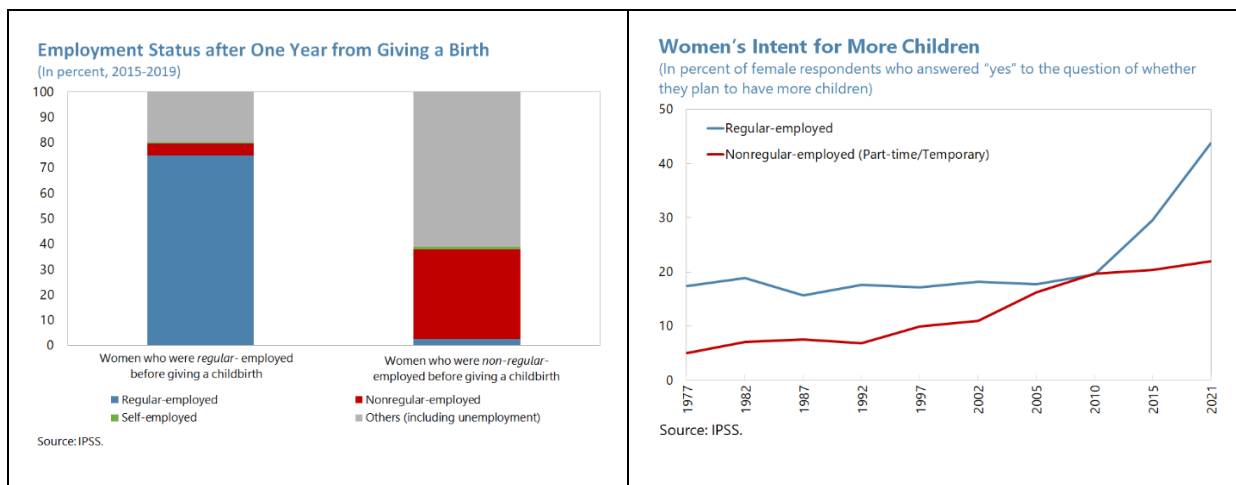
Japanese women engage in over five times more unpaid work (such as childcare and elderly care) than men. Conversely, men perform 166 percent of paid work compared to women. This imbalance indicates an unequal division of labor across genders between paid and unpaid work in Japan, which may dissuade women from having children. The IPSS survey shows that about half of the women who have fewer children than their preferred number attribute the reasons either to 1) “having more children will make managing their work (either paid or unpaid) difficult”; 2) “they cannot endure the psychological or physical burden of further childcare”; or 3) “because their husbands do not support unpaid household or childcare duties”.

³ The number of waitlisted children nationwide is 2,680 as of September 2023. 90 percent of them are concentrated in the age group of 0-2 years old.

⁴ OECD family database (https://www.oecd.org/els/soc/PF2_1_Parental_leave_systems.pdf).



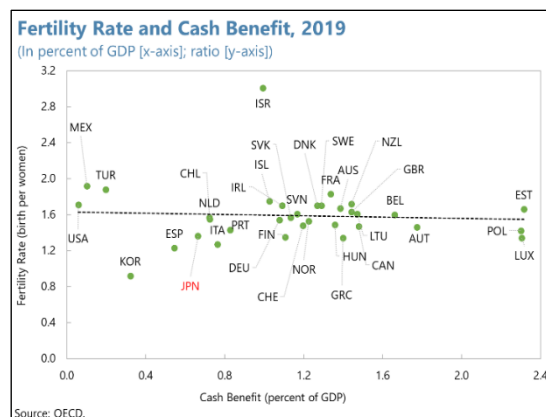
9. Women in non-regular employment often face a larger reduction in salaries or fewer career opportunities after childbirth. Komura (2022) suggested that the reduction in earnings (termed the ‘child penalty’) is more significant for mothers employed in non-regular positions than for those in regular employment. Moreover, the IPSS survey shows that only around 38 percent of non-regularly employed women return to work, a rate significantly lower than the 79 percent among regularly employed women.⁵ These findings suggest that a transition from non-regular to regular employment among women could reduce the ‘child penalty’ and enable mothers to sustain their careers, leading to less career concern and potentially a higher fertility rate. Indeed, the IPSS survey indicates that mothers in regular employment show more than double the preference to have more children.



10. On the other hand, there is limited empirical evidence to suggest a tight link between cash transfers schemes and fertility rates. The cross-country data (34 countries included in the OECD family database) suggests that there is no evident correlation between cash

⁵ Among the regularly employed women, 74 percent return to regular employment one year after giving birth, while 5 percent transition to non-regular employment.

transfers and fertility rates. Previous studies have yielded mixed results on the treatment effect of cash transfers. Even among those studies reporting a positive relationship, the effect of cash transfers on fertility rates remains limited. Bauernschuster, Hener, and Rainer (2016) suggest that expenditures on childcare facilities have a five-time greater impact on the fertility rate than cash transfers.



Box 1. Sweden and Germany: Case Studies of Children-Related Policies

Norway and Sweden - "daddy quota"

Norway and Sweden, despite facing a decline in the fertility rate over the past decade, are renowned for their implementation of successful childcare policies. They introduced the "daddy quota" scheme in 1993 and 1995, respectively. This policy reserves a part of paid parental leave periods for fathers, meaning that the family loses the paid-leave period if the father does not take leave. This gives a strong financial incentive for the father to take paternity leave, and the usage rate of paternity leave rose from 4 percent to above 90 percent from 1995 to 2003 in Norway. Sweden also has a high usage rate of paternity leave, which stands near 90 percent.

Germany – expansion of childcare facilities

Germany is a unique case among advanced economies, where the fertility rate has been on an upward trend in the past two decades. The authorities upgraded children-related policies in the early 2000s to narrow the gender gap in childcare, and the expansion of childcare facilities played a key role. They approved the Daycare Expansion Act in 2004 and Childcare Expansion Act in 2007 to introduce all-day schools and childcare facilities for children aged 0-2. Moreover, starting in 2013, parents have been entitled to request institutional childcare for their child from their first birthday onwards. The fees differ across federal states but generally depend on parents' income and are progressively subsidized by the states. As described in UNFPA (2019), due to these policy initiatives to expand childcare facilities, over 90 percent of children between the ages of three and six spend at least part of the day in kindergarten. However, childcare provision for children aged 0-2 still falls short of demand, particularly in the western part of Germany. In 2017, 45 percent of parents with children under the age of 3 expressed their wish to enroll them in childcare, yet only 33 percent secured enrollment.

Regarding parental leave policies, Germany has adopted the Nordic country model. In 2007, a new parental leave system similar to the Swedish "daddy quota" was introduced. Furthermore, Germany implemented a flexible parental leave system since 2015, allowing parents to take leave on a part-time basis for up to 36 months. The moderate increase in Germany's fertility rate over the past decade can be attributed to various factors, including the higher fertility rates among incoming migrants, but former research such as Sobotka, Matysiak, and Brzozowska (2019) suggests that policy reforms have contributed to a rise in fertility rates among highly educated women at later stages of childbearing.

C. Data and Methodology

11. In the empirical analysis, we construct a panel dataset for 42 OECD countries to analyze the drivers of fertility. On structural indicators, we capture the fertility rate, social policies, and socioeconomic conditions, such as the gender gap in unpaid work and the average duration of taken parental leave. We combine the structural variables with the GDP-per-capita series, real GDP growth, and CPI inflation to capture the business cycle, while controlling for linear and quadratic trends in country-level fertility rates.⁶ In Table 1, we report estimated coefficients for the following linear regression, confirming a positive correlation between some of the policies and the fertility rate:

$$fertility_{i,t+1} = fertility_{i,t} + \{policies\}_{i,t} + age\ at\ childbirth_{i,t} + marriage\ rate_{i,t} + GDP_{i,t} + CPI_{i,t} + FE_i + t_{i,t} + t_{i,t}^2 + const$$

Table 1. Cross-Country: Linear Regressions Between Fertility and Policy Measures

	Lead of fertility rate						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fertility rate	0.692*** (18.71)	0.650*** (13.80)	0.662*** (13.89)	0.672*** (17.16)	0.586*** (8.04)	0.548** (3.25)	0.610*** (7.73)
GDP per capita (10,000 USD)	0.0541 (1.67)	0.0943* (2.11)	0.0299 (0.61)	0.048 (1.42)	0.059 (1.19)	0.209* (2.10)	0.0906 (1.16)
Policy	Cash benefits 1.65 (1.57)	Children aged 0-2 in childcare -0.00216 (-0.04)	Children aged 3-5 in pre-primary 0.123 (1.32)	Expenditure on families 2.38** (2.74)	Parental leave duration 0.127 (1.36)	Parental leave (men) -0.132 (-0.58)	Gender gap in unpaid work -66.3** (-3.18)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE, Year, and Year ²	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	639	422	429	601	249	100	181

t statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001

12. The difficulty in identifying successful policy measures lies in the issue of endogeneity. Crucially, countries with difficulties in supporting the desired fertility levels are more likely to implement the relevant policy measures to alleviate the problem. This implies that running the linear regression to identify the policy mechanisms that successfully increase fertility will yield biased results. One common approach used in the literature is to utilize natural experiments and analyze the performance of the given policy by looking at the child-related decisions of the households surrounding the moment of the introduction of a given policy. This method delivers results that possess a robust internal validity but are more challenging to interpret when comparing the policies between countries.

⁶ For detailed sources, see OECD (2005a), "Society at a Glance – OECD Social Indicators," OECD, Paris. Data on economic indicators are from the IMF.

13. In this study, we address the concern of endogeneity and achieve the estimation results with more external validity using a novel approach. Effective fertility policies allow households to have more kids despite adverse economic conditions. We draw on the recent work by Coskun and Dalgic (2024) that introduced a novel model calibrated to US data. The authors demonstrate that a rise in female labor force participation and the associated increase in their contribution to household income, especially during recessions had a two-fold effect on fertility: it reduced the level of fertility and led to a high positive correlation between the fertility rate and the business cycle. Japan has experienced a similar labor market trend with a rise in female labor force participation in past decades, hence the policies that aim at reducing the time burden of having children for women (e.g., addressing the gender gap in unpaid work or enhancing childcare accessibility) are expected to simultaneously elevate the fertility rate and reduce its cyclicity.

14. We rely on the results from the theoretical study above to formulate two assumptions crucial for our empirical strategy. Specifically, the first assumption relies on the idea above, that captures the simultaneous impact of a rise in female labor force participation on the decline in fertility level and its' increased cyclicity with business cycles. The second assumption is that children-related policies tend to be permanent once they are introduced, and households perceive these policies as fixed, changing their fertility decisions permanently. The business cycle introduces variation in the households' income that affects their child-related decisions on a much higher frequency than governmental policies. We use this exogenous faster-moving GDP growth as our identifying variation to find policies that reduce the cyclicity of fertility, consistent with our second assumption. Then, relying on the first assumption we argue that they do so by affecting the opportunity cost of time for women and conclude that same policies are effective in bolstering fertility rate level.

15. Our baseline specification regresses the one-year ahead growth in the fertility rate on a set of explanatory variables. Becker (1960) and Butz and Ward (1979) highlighted the connection between fertility and the business cycle via the labor market outcomes of parents and used US data to illustrate its significance. In this study, we apply their logic to a cross-country setting. Our explanatory variables include real GDP growth and GDP per capita (in tens of thousands of US dollars). The control variables are the fertility rate level, the average age at childbirth, marriage rate, CPI inflation, country fixed effect, and a country-specific quadratic time trend:

$$\Delta fertility_{i,t+1} = \% \Delta GDP_{i,t} + GDP_{i,t} + \% \Delta GDP_{i,t} \times GDP_{i,t} + [fertility\ rate_{i,t} + age\ at\ childbirth_{i,t} + marriage\ rate_{i,t} + CPI_{i,t} + FE_i + t_{i,t} + t_{i,t}^2 + const]$$

D. Empirical Results

16. First, we establish that fertility rate growth is procyclical with respect to the lags of GDP growth. This can be seen from the first regression in Table 2 and illustrates the positive relationship between households' economic conditions and willingness to have children. This relationship declines in strength with the level of GDP in the country since the share of households that are at the margin of being severely affected by the business cycle declines with average income,

which is illustrated by the negative coefficient on the interaction of the GDP growth and per-capita GDP in the second column.

Table 2. Baseline Cross-Country Regressions: Fertility Growth and Economic Growth

	Lead of fertility rate growth	
	(1)	(2)
Real GDP Growth (%)	0.138*	0.319***
	(2.44)	(3.76)
GDP per capita (10,000 USD)	0.0216	0.0428
	(0.84)	(1.68)
Real GDP Growth (%) * GDP per capita		-0.00896***
		(-3.80)
Total fertility rate (children per woman)	-9.741***	-9.512***
	(-7.59)	(-7.46)
Average age at childbirth	4.109***	4.032***
	(10.01)	(9.87)
Marriage rate (marriages per 1000 people)	0.705*	0.705*
	(2.32)	(2.31)
CPI	-0.00125	0.00257
	(-0.18)	(0.37)
Country FE, Year, and Year ²	Yes	Yes
Constant	-26251.1***	-28769.5***
	(-5.29)	(-5.98)
N	1549	1549

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

17. By the same logic as GDP per capita reduces the procyclicality of fertility rate growth, the introduction of a successful policy that boosts fertility should have a dampening effect on its cyclicity. Specifically, if the policy is successful, households should be less responsive to fluctuations of economic conditions in their childbearing decisions. The successful policy effectively “shields” families from adverse economic conditions. This means that by introducing the specific policy into the regression and its interaction with GDP growth, we should observe the negative coefficient on the interaction for the successful policies. When combined with our main assumption that the same policies are effective for raising the level of fertility and reducing its cyclicity, this helps us to identify the successful fertility-increasing policies. Notice that the coefficient on the policy itself is not crucial in this setting since it shows the effect of the one-time policy on the permanent change in the fertility rate growth, which should be zero in a large sample. Since our data is limited, some of the coefficients turn out to be significantly different from zero at conventional confidence levels. We can’t use these coefficients to determine the successful policies, since they are biased, but nonetheless, they illustrate that there was a shift in the fertility rate once the policy was introduced. For example, the coefficients on “total expenditure on families” and “gender gap in unpaid work” are statistically significant. Whilst this can be seen as a confirmation of these policies’ effectiveness in raising fertility, the insignificant coefficients for other policies can’t be taken as evidence to reject their effectiveness, since the coefficients can be biased because of the

short dataset. Indeed, if the policy had been introduced a while back, the adjustment of the fertility level would already have happened, and there would be no further effect on its growth.

18. We run multiple regressions that test the effectiveness of different policy measures separately on the subsample of OECD member countries. From the Table 2 columns, we can see how these policies stack up against each other. The only policy that successfully boosts fertility is pre-school childcare enrollment. Notice that the effect of increasing enrollment by one percentage point is comparable to the effective increase in GDP per capita by 10,000 USD. Importantly, cash benefits have no significant effect on fertility, which illustrates that this commonly accepted practice has questionable effectiveness in boosting fertility. Importantly, for different policies the size of the dataset varies substantially. For some variables like the duration of parental leave and gender gap in unpaid work, the available dataset is short, which means that the insignificant coefficients can be an artifact of the small dataset.

$$\Delta fertility_{i,t+1} = \% \Delta GDP_{i,t} + GDP_{i,t} + \% \Delta GDP_{i,t} \times GDP_{i,t} + \% \Delta GDP_{i,t} \times \{policies\}_{i,t} + \text{controls}$$

Table 3. Main Cross-Country Regressions: Fertility Growth and Policies

	Lead of fertility rate growth						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Real GDP Growth (%)	0.559*** (4.27)	0.612*** (3.84)	1.238** (2.71)	0.538*** (3.50)	0.0339 (0.16)	0.790 (1.14)	0.742** (3.10)
GDP per capita (10,000 USD)	0.0656 (1.96)	0.135** (2.99)	0.0534 (1.18)	0.0541 (1.59)	0.0746 (1.49)	0.286* (2.32)	0.125 (1.67)
Real GDP Growth (%) * GDP per capita	-0.00655* (-2.00)	-0.00804* (-2.17)	-0.0110** (-2.74)	-0.00262 (-0.75)	-0.0107* (-2.34)	-0.0319* (-2.25)	-0.0124* (-2.03)
Cash benefits for families (% of GDP)	1.512 (1.39)						
GDP Growth * Cash benefits	-0.194 (-1.66)						
Children aged 0-2 in formal childcare (%)		-0.0214 (-0.37)					
GDP Growth * Children 0-2 in childcare		-0.0111* (-2.04)					
Children aged 3-5 in pre-primary (%)			0.120 (1.26)				
GDP Growth * Children 3-5 in pre-primary			-0.0114* (-2.06)				
Total expenditure on families (% of GDP)				2.575** (2.76)			
GDP Growth * Expenditure on families				-0.160 (-1.79)			
Parental leave duration (days)					0.0616 (0.60)		
GDP Growth * Parental leave					0.00306 (0.41)		
Parental leave duration: Men						-0.0578 (-0.25)	
GDP Growth * Parental leave: Men						0.00710 (1.00)	
Gender gap in unpaid work (ratio)							-65.54** (-3.25)
GDP Growth * G. gap in unpaid work							-1.225 (-1.69)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE, Year, and Year ²	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	639	418	425	601	249	100	178

t statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001

E. Policy Implications

19. Sustained economic growth is fundamentally important for supporting childbirth. Our empirical analysis indicates that fertility rate growth is procyclical with respect to GDP growth. This means that sustained economic growth plays a fundamental role in raising fertility rate. In addition to implementing policies specifically aimed at raising fertility rates, the authorities should work on sound macroeconomic management to support continuous economic growth.

20. Both the case study and the empirical analysis⁷ suggest that a further expansion of childcare facilities to infants could help improve Japan's fertility rate. While the availability of childcare facilities has improved in the past decade, the waitlist remains relatively high for children aged 0-2. Also, it is worth noting that the waitlist numbers might be underrepresented since some children could be excluded from the waitlist statistics in certain cases⁸. One of the bottlenecks of a further expansion of childcare facilities is the shortage of nursery teachers. The job-to-applicants ratio of nursery teachers is 3.1, which is more than double of the national average of 1.4 as of January 2023. This shortage is driven by the relatively low wages of the nursery teachers, with their average salary about 17 percent lower compared with that of full-time employees. Policies should help address staff shortages and further expand the availability of childcare facilities, particularly for infants, which would help mothers return to the workplace with limited impact on employment, career, and income prospects. It will help alleviate women's concerns about having children by providing reliable childcare options after birth. Attracting foreign workers to address labor shortages (e.g., nursery teachers) could complement the support provided by childcare facilities.

21. Policies should aim to facilitate fathers' contributions to home/childcare. The recent introduction of measures to facilitate parental leave⁹ and the co-parenting initiative under the "Children's Future Strategy" are steps in the right direction. Going forward, a better designed parental leave system with incentives for fathers to take leave, for example, by introducing "daddy quota" (like in Norway and Sweden) could help improve the burden sharing of childcare and housework between fathers and mothers. In Japan, a "papa-mama parental leave plus" scheme¹⁰ exists, but the incentive for fathers to take paternity leave is limited, since mothers can take paid leave for up to two years under certain conditions, regardless of the length of the father's leave. This means that fathers do not have strong incentives to use the scheme. In Sweden and Norway, the

⁷ The empirical analysis shows that a further expansion of childcare facilities has a dampening impact on the cyclicity of fertility rate growth, shielding households from the fluctuations in the economic conditions in their childbearing decisions.

⁸ For instance, children whose parents are on parental leave are excluded from the waitlist. This means that if parents are taking leave because they cannot find appropriate childcare facilities (parents can extend their parental leave beyond the standard one year to the maximum period of two years), these children will not be included in the waitlist count.

⁹ In April 2022, the authorities made it mandatory for employers to individually explain parental leave and relevant policies to employees with the aim of encouraging its adoption. In April 2023, they also set a new requirement for companies (with over 1,000 full-time employees) to annually disclose the status of childcare leave.

¹⁰ In this scheme, the window in which a parent can take paid parental leave becomes wider from one year to one year and two months if both parents take parental leave.

duration of paid maternity leave is set to be shorter than the window in which parents can take parental leave. This means that the total paid period for a household can be extended only when fathers take paternity leave, incentivizing fathers to do so. Implementing a similar mechanism will incentivize more fathers in Japan to take longer paternity leaves.

22. Further progress on workstyle reforms, including through teleworking, could also help support fertility and childcare arrangements. Since 2013, significant progress has been made on work-style reforms and childcare services, which helped boost female labor force participation. However, women tend to opt for part-time jobs that under-utilize their skills, given inflexible working schedules and long working hours of full-time positions (see *Selected Issues Paper: Why So Few Women in Leadership Positions in Japan?*). In this context, work style reforms, such as the enhancement of teleworking and flexible working hour arrangement, can help women by providing more flexible work arrangements while also allowing men to share more housework.

23. Further labor market reforms, including reducing labor market dualism, is also essential. While the government has been successful in increasing female labor force participation over the last decade, a substantial gender gap remains. A large share of female workers are non-regular and non-career track workers with lower wages and limited skill development and career advancement opportunities. As the IPSS survey indicates, women under regular employment have a higher likelihood of returning to employment compared to those under non-regular employment. This, in part, reflect that women in regular employment tend to have better access to parental leave, which assists them in mitigating the 'child penalty' associated with wage reduction. The IPSS survey also shows that women in regular employment are more willing to have more children. These suggest that labor market reforms to encourage more regular employment and reduce labor market dualism would help women continue their career development and reduce financial concern of having children over the long term, thereby contributing to raising the fertility rate.

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SUSTAINABLE PATH TO INCLUSIVE GROWTH IN JAPAN: HOW TO TACKLE INCOME INEQUALITY?¹

A. Introduction

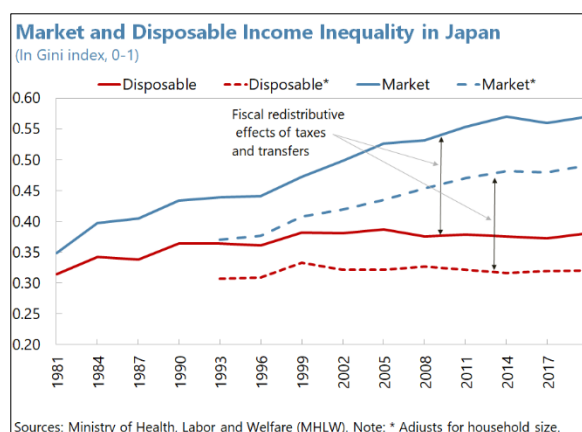
1. Income inequality matters for growth and sustainability. Increasing concentration of incomes is found to reduce aggregate demand and undermine growth, because the wealthy spend a lower fraction of their incomes than middle- and lower-income groups (Carvalho and Rezai, 2016). Higher inequality may also lead to policy choices that hurt growth. For instance, it may increase demands for hikes in public expenditure to counter inequality, resulting in tax increases down the pipeline that may have negative implications for growth (Dabla-Norris and others, 2015).

2. In this paper we seek to understand the key sources of income inequality in Japan and identify the policies that could help make the Japanese society more equal. This is a relevant exercise as: (i) Income inequality in Japan has been on a rise and is high across comparator countries. (ii) Reducing inequality is a key focus of PM Kishida's New Capitalism agenda. (iii) While most of the current literature provides theoretical arguments for what might be driving the income inequality in Japan using macro-level data (Colacelli and Anh, 2018; Aoyagu and others, 2015), our paper provides a comprehensive analysis by digging deeper into micro household-level survey data to better identify the underlying factors that drive inequality, including how these drivers vary across different household characteristics.

B. Macroeconomic Trends in Income Inequality

3. Market income inequality in Japan has been on a steady rise since the 1980s. The Gini coefficient for market income (income before taxes and transfers) has been on a steady rise since the 1980s – increasing by close to 60 percent between 1980-2019 – and is now close to the OECD average. This rise is partially attributable to the demographic transition, i.e., the rise in the share of the elderly in the population (Aoyagi and others, 2015).

4. Gross and disposable income inequality have risen much less, reflecting the active role of fiscal redistribution through taxes and transfers. The Gini coefficient of gross income (income after transfers) worsened by close to 19 percent between 1980-2010, but has somewhat stabilized in the last decade before the pandemic

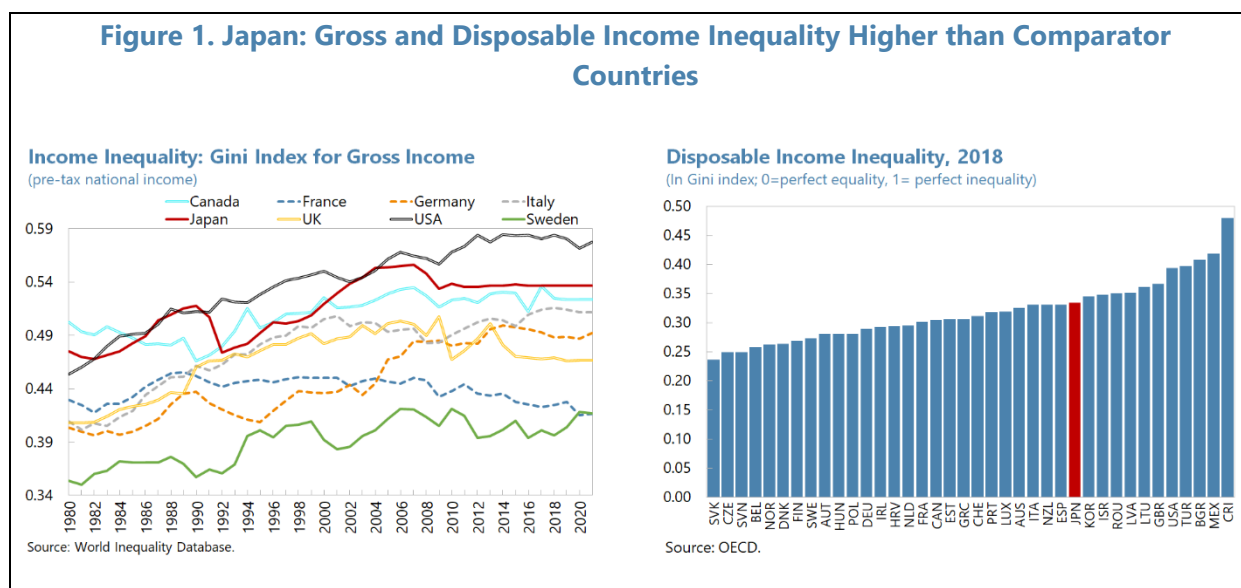


¹ Prepared by Purva Khera (APD) and Yun Gao (OAP).

(2010-19). When including the effects of taxes, the Gini coefficient for disposable income (income after transfers and taxes) rose by 21 percent between 1980 and 2000, but has stabilized since.

5. Income inequality is high in comparison to several advanced economies. While the total fiscal redistributive effects—the gap between the respective market and disposable income Gini coefficients—have increased over time in Japan, disposable income inequality is still higher than the OECD average. However, these cross-country measures of income inequality could be sensitive to the underlying dataset used. For instance, Mikayama and others (2023) use a more comprehensive dataset for Japan— combining the largest household survey dataset with close to 70,000 households with the income tax dataset—for a more accurate estimation of the income distribution in Japan. They find that the top 1 percent and 10 percent income shares in Japan are lower than those for the U.S. and at similar levels to European countries in 2019.

6. Moreover, fiscal redistribution through taxes and transfers may have an efficiency cost. [OECD \(2011\)](#) discusses that reliance on the tax and transfer system as a major mechanism of equalization of income may not be an efficient (including posing a tradeoff with economic growth) or financially sustainable strategy. It is therefore important to tackle market income inequality through other means, and this paper delves deeper into those.



C. Empirical Analysis: Data and Methodology

7. For a more granular study of inequality in Japan, we use the Japan Household Panel Survey and the Keio Household Panel Survey (JHPS/KHPS). This is a representative Japanese household panel survey conducted every year since 2004, with a total sample size of about 5,000 households (Box 1).² The JHPS/KHPS asks about the various income sources of the respondent, their

² The KHPS and the JHPS had similar questionnaires and were managed independently before 2014. Since 2014 their questionnaires were unified and combined as the Japan Household Panel Survey.

spouse, and the aggregated incomes of other family members in the household. Since the 2009 wave, the survey has included data about labor income of households, and divides income sources into wage employment income, self-employment income, capital income, and transfer income. In our analysis we focus on the data from 2010-19 (corresponding to survey waves 2011-20), which spans the period after the global financial crisis and until before the pandemic.

8. Inequality is measured based on per capita household gross income and market

income. The use of the “household” as the income unit follows the most common practice in the literature.³ Market income is the sum of wage income, self-employment income, and capital income. Gross income is the sum of market income and cash transfers. Wage income is segregated into wages and salaries from regular and nonregular employment, respectively. Self-employment income includes net business income of self-employed workers and home-work income (including agriculture, forestry and fishery income). Capital income includes rent income, interest, and dividends. Cash transfers include public pension, corporate and personal pensions, unemployment benefit, childcare allowances, and other transfers.⁴ The JHPS/KHPS does not collect data on tax payments, which is why we were unable to analyze the income inequality in disposable income – and therefore this paper does not comment on the impact of taxes on inequality.

9. We decompose the overall Gini index (G) to estimate how each income source contributes to total inequality. The methodology follows Lerman and Yitzhaki (1985) and is described in Box 2.

10. There are three channels through which each income source (k) affects overall income inequality. (i) share of each income source in total income (S_k); (ii) inherent within-group income inequality with which the income source is distributed (G_k); and (iii) the correlation of income source with total income inequality (R_k). The change in the overall Gini coefficient over time can be decomposed into the changes in the shares of each income source (share effect) and changes in the concentration coefficients (concentration effect) of the different income sources (see below).

11. The concentration coefficient⁵ (also referred to as the quasi-Gini coefficient in the literature), which lies between -1 and 1, is a product of G_k and R_k . It captures both the inherent inequality with which a given income source is distributed (source Gini coefficient) and the correlation of that source with overall income inequality. A negative (or positive) value shows that a given source is negatively (or positively) correlated with overall income, i.e., it is progressive (regressive). For instance, an inherently unequal source, such as social assistance, with a high Gini

³ Given that income is often shared within a family or a household, we find it more appropriate to look at disparities in household income, as opposed to individual income. Typically, earnings dispersion among households is lower than among individuals because of income pooling within the household, as well as the fact that families can provide insurance against individual risks.

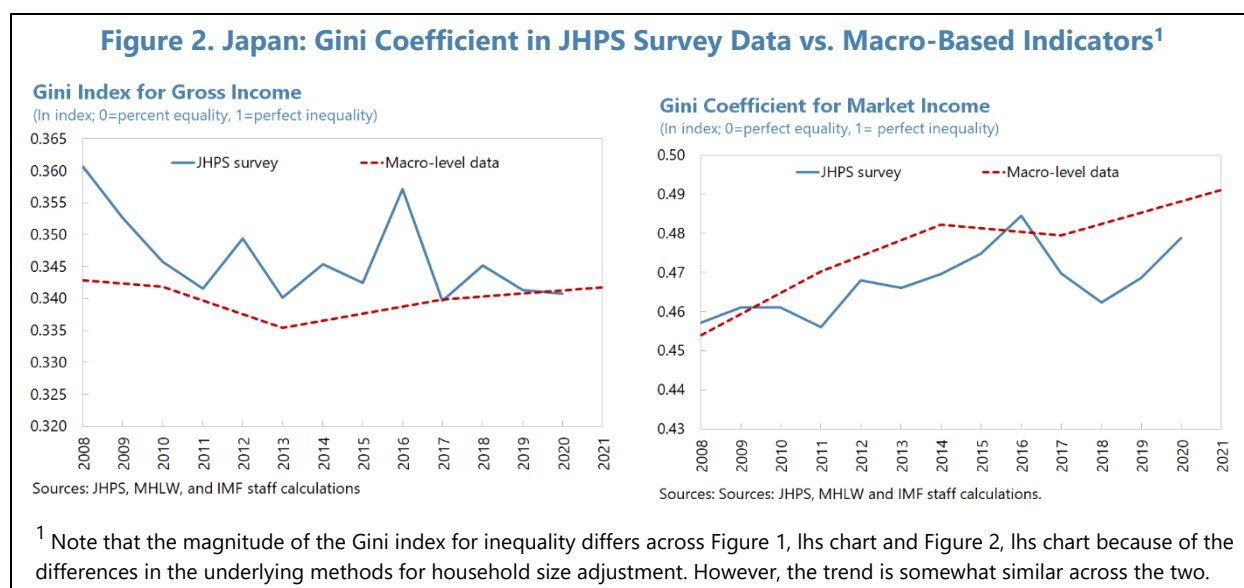
⁴ For example, the “Special Cash Payment” during the covid pandemic is included in the other transfers.

⁵ The concentration coefficient shows the concentration (or cumulative percentage) of an income source (for example, social transfers or wages), when recipients are ranked by amount of income. The coefficient ranges from -1, when the entire income source is received by the poorest (by income) recipient; through 0, when all recipients receive the same amount; to +1 when the entire income source is received by the richest recipients.

coefficient will have a low or negative correlation with overall income (as most social assistance recipients are likely targeted towards the poor), and its concentration coefficient will be low or negative. Moreover, as long as $C_k < G$ (even if it is positive), the income source k will have some redistributive effects.

D. Results

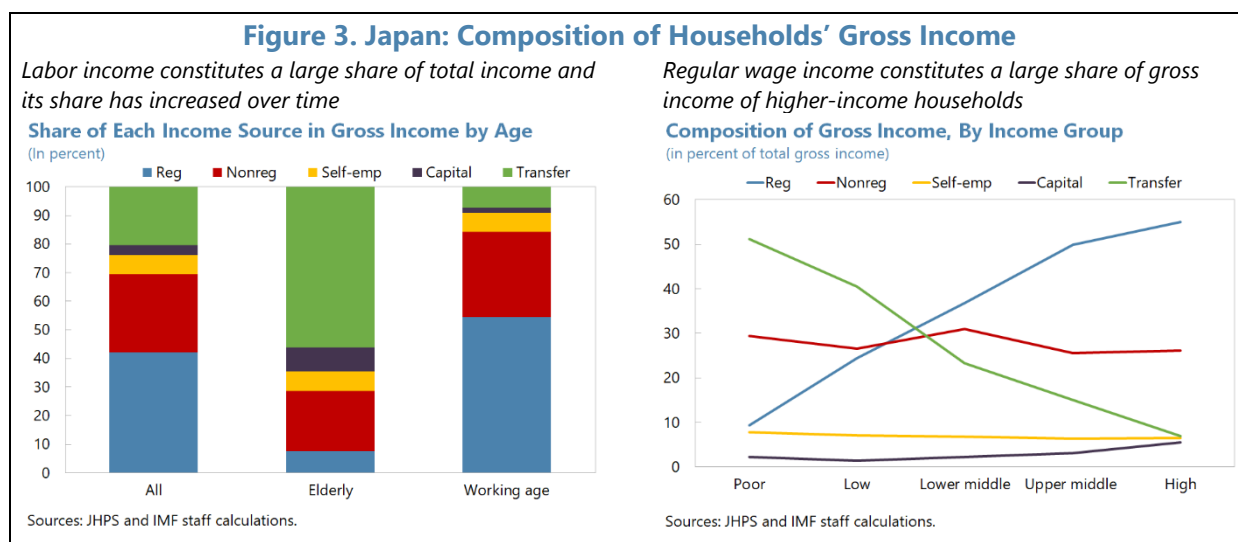
12. On an aggregate level, the findings from the household-level data match the macro-based indicators (Figure 2). Before we begin to use the JHPS data to analyze inequalities in Japan, we check whether the micro data from the JHPS are consistent with the macro data. The Gini coefficients for gross and market income are consistent across the two and show that income inequality somewhat stabilized over the decade prior to the pandemic. This suggests that the household survey data forms a reliable representation of the population at large.



13. Overall gross income inequality has marginally declined, whereas market income inequality has increased. Consistent with the macro data, market income inequality is much higher than the gross income inequality. The former has somewhat stabilized and overall declined by 1.3 percent over the pre-COVID decade. Market income inequality, on the other hand, has increased by 1.7 percent.

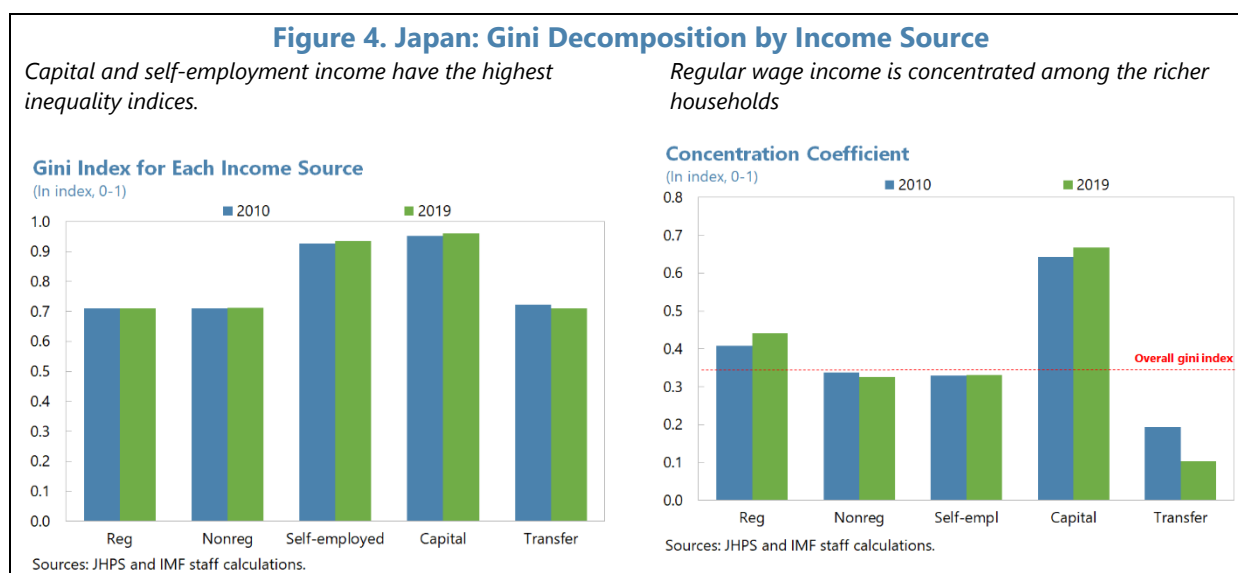
14. Wage income constitutes on average 70 percent of household income (S_k), followed by transfers which account for 20 percent in 2019 (Figure 3, lhs chart). Within wage income, regular wage income constitutes two thirds and its share in total income has increased over time. On the other hand, the share of nonregular wage income has remained broadly unchanged. However, it varies substantially across income groups – share of regular wage income is the highest amongst the richer households whereas transfers form the largest income component amongst the lower-income households (Figure 3, rhs chart). Moreover, the income sources also differ across the elderly vs. the working age population – transfers and capital income constitute a relatively larger share of

the income of the elderly population, whereas the regular wage income as a share of gross income is less than 8 percent.

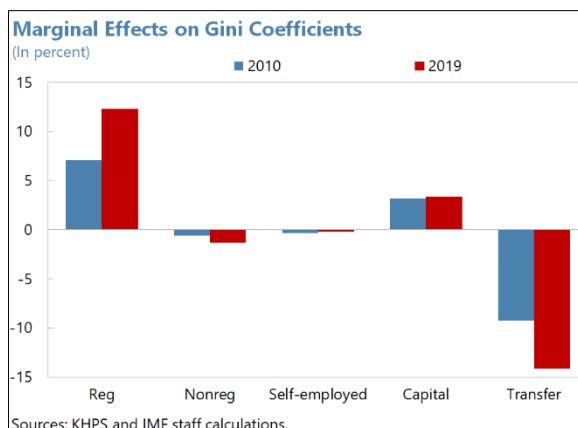


15. Capital income is the most unequally distributed among the various income components, followed by income from self-employment (Figure 4, lhs chart). This is based on the Gini index for each income source k (G_k), which has not changed much over time. Wage income inequality among nonregular workers is slightly higher than within regular workers, although the difference is small.

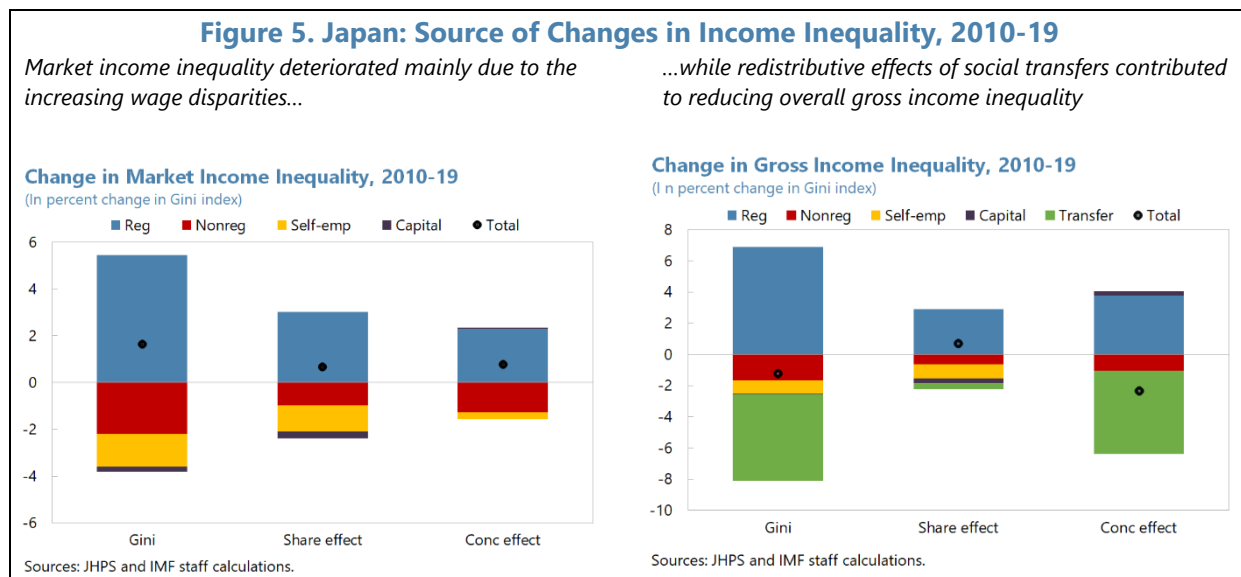
16. Regular wage income and capital income are more concentrated among the richer households (Figure 4, rhs chart). This is based on the concentration coefficient for each income source (C_k). On the other hand, transfers and nonregular employment are relatively more concentrated among the lower-income groups (as $C_k < G$), and thus have a somewhat redistributive effect.



17. Transfers contribute to lowering inequality, while an increase in regular employment and capital income increases inequality.⁶ This is because although the former is also unequally distributed (its respective Gini index is close to that of regular wage income), it is mostly concentrated amongst the lower-income households, so a marginal increase in it all else equal will have an equalizing effect on the overall income distribution across the population. In 2019, a 1 percent increase in income from transfers, all else equal, reduces inequality by close to 14 percent. While a similar increase in regular wage income and capital increases it by 12 and 4 percent, respectively. These unequalizing effects of regular employment income and equalizing effects of transfers have increased considerably over the years.



18. In terms of the change in gross income inequality over time, four factors are found to be the key drivers: (i) changes in the age distribution (i.e., ageing of the population); (ii) changes in the labor market structure (i.e., increasing dualism), (iii) increase in the labor force participation/ employment of females and elderly; and (iv) changes in the distributions of social transfers. While the former two had a unequalizing impact, the latter two helped lower income inequality. On aggregate, the equalizing impact of the redistributive effects of transfers and the higher labor force participation/ employment of females and elderly marginally offset the negative impact of ageing population and increased dualism in the labor market (Figure 5).



⁶ If $C_k < G$ ($C_k > G$), then income source k reduces (increases) inequality.

The Effects of Transfers

19. Fiscal redistribution through social transfers is found to be effective in lowering income inequality. It reduced the Gini coefficient on market income by 33 percent in 2010 and by 37 percent in 2019, although note that this includes the impact of pension benefits (Figure 6, lhs chart).⁷ Consistent with macro-level data, this mainly benefits the elderly, with a significantly smaller reduction for the working age population, as social spending in Japan is mainly concentrated on the elderly (Hisanaga, 2022). Moreover, over time, it also helped reduce the Gini coefficient on total gross income by 6 percent between 2010-19 (Figure 5, rhs chart). This is largely because social transfers have become relatively more concentrated among the lower-income groups over time, i.e., their redistributive effects have become stronger.

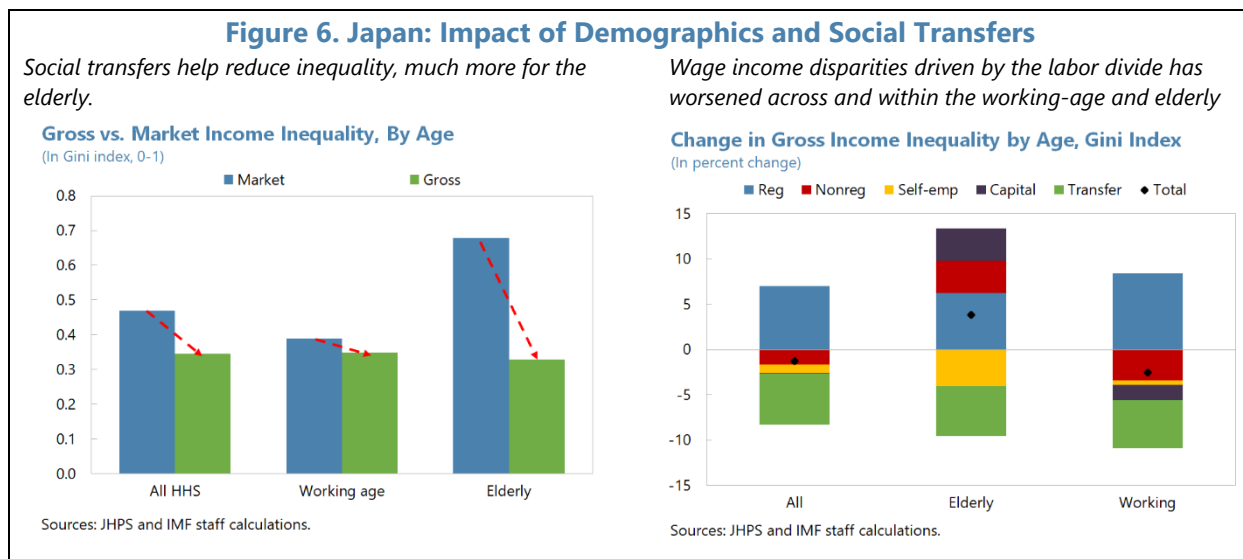
20. However, the distributional impact is weak. For the elderly, the concentration coefficient is positive in most countries, including Japan, as it includes pension benefits whose amount is linked to past income. For the working age population, in contrast, this coefficient is negative in most OECD countries, indicating that the amount of transfers increase as the level of household income declines (“progressivity”). In contrast, in Japan, it is positive, suggesting that the distributional impact of transfers on low-income households is relatively weak in comparison to other countries (An and Asao, 2023).⁸ [Heisz and Murphy \(2015\)](#) show that for two equal-sized transfers, the more appropriately targeted and progressive transfer would have a larger redistributive effect.

Progressivity of Transfers Concentration Coefficients in 2019		
	Japan	OECD avg.
Total	0.10	0.14
Pensioners	0.17	-0.06
Working-age	0.10	-0.07

21. Moreover, fiscal transfers are not an efficient means to tackling inequality. Fiscal costs of redistribution could be high, especially in a constrained fiscal environment (para 6). The increasing share of the elderly population and the current high public debt is expected to put further pressure on Japan’s public finances.

⁷ Pensions constitute close to 40 percent of the total transfers in the dataset.

⁸ The progressivity of social spending is measured by the concentration coefficient which varies from -1 to 1. A value of zero indicates that the same amount of transfer is paid to each household. Positive values indicate that the amount of transfers increases with private income (regressive).



The Effects of Demographics

22. Ageing of the population where there are growing elderly and fewer share of younger people has led to an increase in overall income inequality. The share of the population aged above 65 has increased by 10 percentage points over the last decade. The incomes of elderly are lower than average including because many have no labor income, and growing numbers of them widens the income differentials between the old and young. Also, the distribution of wages is more unequal for older workers.

23. However, some of this increase has been offset by redistributive effects of transfers (discussed above), as well as the increasing labor force participation and employment of the elderly (discussed below).

The Effects of Female and Elderly Labor Supply

24. More participation and employment of females and elderly in the labor market is found to be an income equalizing force.

Japan added 2.9 million women and 3.5 million elderly (age 65 and above) to the labor force between 2010-19. This reflects better childcare availability and other policy reforms to alleviate labor shortages as a result of demographic trends. Both female and elderly labor force participation rates went up by 6 ppt each, respectively. At the same time, the

unemployment rate declined from 5 to 2.3 percent. This helped increase employment income for those that were outside the labor force before, while also increasing the incidence of dual and multi-income earner households, making the labor income overall more equally distributed.⁹ It also

	Average Gini (2010-19)		% Change Between 2010 and 20219	
	Gross	Market	Gross	Market
All hhs	0.34	0.47	-1.3	1.6
Working age	0.35	0.39	-2.5	-4.8
Elderly	0.33	0.68	3.8	-2.9
Male	0.33	0.44	1.3	0.5
Female	0.55	0.69	-9.2	-4.9

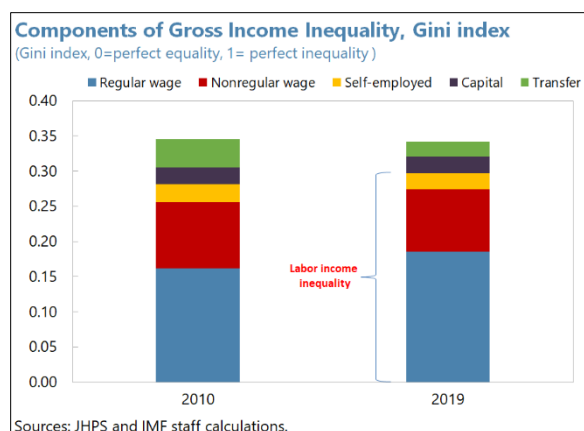
⁹ It also increases the inequality between dual-earner households and single households.

helped reduce the Gini index for market income among females by close to 5 percent between 2010-19, and that amongst the elderly by 3 percent.

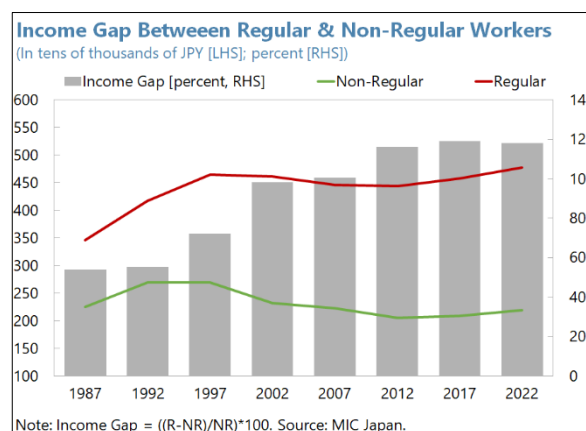
The Effects of the Dual Labor Market Structure

25. The increasing duality in the labor market and structural barriers to full-time employment is associated with worsening market income inequality over time.

- Overall wage inequality constitutes close to 80 percent (90 percent) of the gross (market) income inequality. More than half of the overall income inequality is associated with inequality in regular wages, and its influence on inequality has increased by 10 percentage points over time. This is because the average share of regular wage income in total gross income has grown and this has increasingly benefited the higher-income households. Households with regular employment have become even richer over time, thus widening the income divide with the rest of the Japanese population.



- This is because the growing share of nonregular workers—it has increased from 33 percent in 2010 to 38 percent in 2019—and their declining hours of work has widened the income gap between regular and nonregular workers.¹⁰ On an hourly basis, part-time workers – who account for 70 percent of nonregular workers – were paid only 57 percent as much as full-time workers in 2019. While this hourly wage gap between full-time and part-time workers has narrowed over time, the declining work hours of nonregular workers (due to distortionary effects of tax and social security benefits that force second earners in the family to reduce working hours) and limited mobility opportunities¹¹ has exacerbated income inequality between households with regular employment and others (IMF, 2023). This comparison understates the gap as it excludes bonus payments and retirement



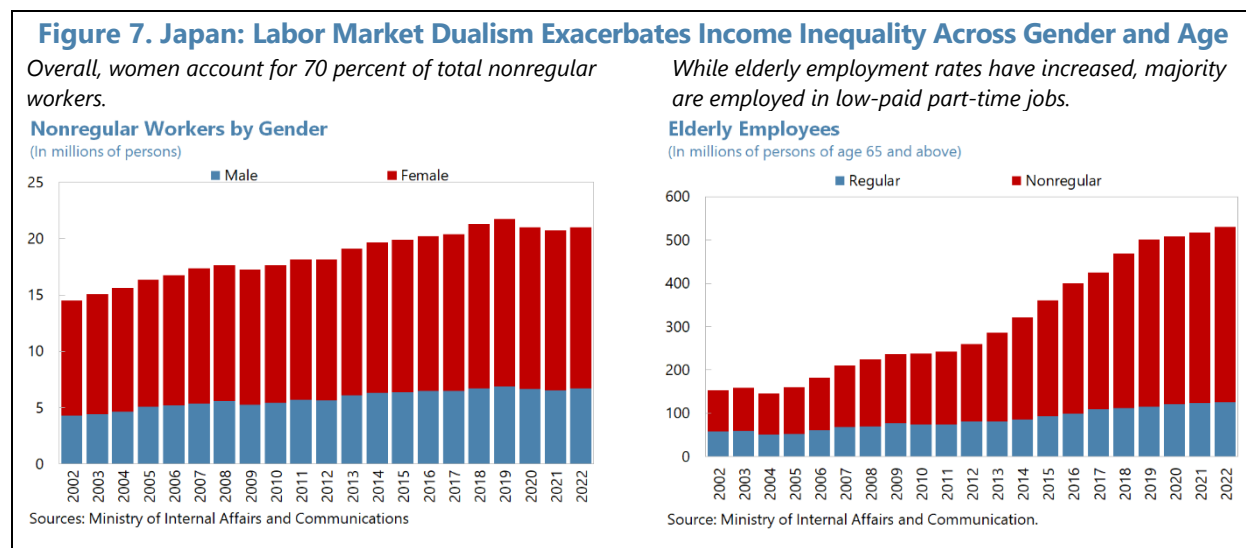
¹⁰ Wage inequality within regular workers and nonregular workers, respectively has remained fairly unchanged since 2010.

¹¹ This is in contrast to many other OECD countries, where informal work is frequently a temporary stop to permanent employment.

benefits, which most nonregular workers do not receive.¹² Moreover, opportunities for career progression and training are typically limited. The wage gap between regular and irregular workers has thus enlarged over time.

26. The dual labor market structure has also weighed on the equalizing effects of increase in female and elderly labor force participation and employment. 70 percent of the females and 85 percent of the elderly that were employed during 2010–19 worked in nonregular jobs. Even women who are employed as regular workers and leave the labor force to care for children tend to be relegated to nonregular status when they return to employment. This has exacerbated the gender wage gaps. For the elderly, under Japan’s seniority-based wage system, firms cannot afford to keep regular workers, prompting them to impose mandatory retirement and transform regular workers to non-regular status thereafter. This shift discourages some employees from continuing to work and lowers the productivity of those who stay, as noted above. Hence, we find that the inequality among the elderly has widened.

27. These results could vary based on the underlying dataset used. For instance, Yoshino and others (2018) use the quarterly dataset from Japan’s Family Income and Expenditure Survey, and find that a rise in the price of financial assets (i.e., capital gains) — possibly linked to an increase in the money supply — that benefited mainly richer Japanese households resulted in a widening of the income gaps and is a key driver of the increase in Japan’s income inequality.



E. Policy Recommendations

28. The following policies are key to achieving sustainable and inclusive growth in Japan:

- **Reducing labor market dualism and improving labor mobility.** While laws to end discrimination (such as the ‘equal pay for equal work’ implemented in 2020) are welcome,

¹² 70 percent of part-time workers do not receive bonus payments and 90 percent do not receive the lump-sum retirement benefit paid by firms.

breaking down dualism requires addressing the factors that encourage firms to hire non-regular workers in the first place, i.e., mainly lower labor costs and greater employment flexibility. As suggested in Aoyagi and Ganelli (2013), one reform option is to introduce a Single Open-Ended Contract for all newly hired workers, complemented by a shift towards a model that combines labor market flexibility and security. In addition, programs to increase skill training would also help enhance the career opportunities and mobility for nonregular workers – raising their productivity and real incomes – and reducing income gaps.

- **Continuing to further boost labor participation of females and the elderly and removing disincentives to employment in the social benefit policies.** Advancing implementation of work-style reforms, including flexible work arrangements such as telework, will help bring more women and elderly into the labor force and in full-time employment (IMF, 2022, Annex IX). The social security and tax distortions related to dependent spouses should also be eliminated to allow for voluntary increases in working hours (Xu and Chahande, 2023).
- **Better targeting of existing social benefit programs can help advance a more equal society.** The fiscal debt situation limits the scope for greater social spending and hence shifting the allocation of social spending to increase the share received by low-income households would help lower income inequality (IMF, 2024).

Box 1. Japan: Household-Survey Database

The Japan Household Panel Survey and the Keio Household Panel Survey (JHPS/KHPS) collects data on the following 11 income categories¹ for a respondent, his/her spouse, and aggregates of other family members:

- i. Annual employment income segregated by type of employment
- ii. Self-employment, business, home-work income
- iii. Rent income
- iv. Interest and dividends
- v. Remittances and gifts
- vi. Public pension
- vii. Corporate and personal pensions
- viii. Unemployment benefits and child-care leave benefits
- ix. Child allowances and childcare allowances (household's total amounts only, without breakdown between household members)
- x. Welfare benefits (household's total amounts only, without breakdown between household members)
- xi. Other income

Annual employment incomes of a respondent and his/her spouse include bonuses and monthly salaries, and are segregated into regular employment and non-regular employment, using information about the type of employment which the KHPS asks separately. Gross incomes of a respondent and his/her spouse are obtained by adding up i~xi for each. The incomes of other family members are available only in aggregates. A household's gross income is obtained by adding up incomes of a respondent, his/her spouse, and other family members, and capital gains of a household. Household income is adjusted by dividing by the household size.

¹ The KHPS asks the amount of severance pay. However, the KHPS does not ask duration of employment which is a key input to calculation of the tax amount for severance pay. Therefore, severance pay is not considered in our model, following Kawade (2018).

Box 2. Japan: Methodology for Factor Decomposition of the Gini Index

We adopt a factor decomposition of income inequality, following Shorrocks (1982), Lerman and Yitzhaki (1985) and Stark, Taylor, and Yitzhaki (1986).

Let y_1, y_2, \dots, y_K denote household income component, and y_0 denotes household total income as below,

$$y_0 = \sum_{k=1}^K y_k.$$

The Gini coefficient of household total income, G_0 , is calculated as

$$G_0 = \frac{2Cov[y_0, F(y_0)]}{\mu_0},$$

where μ_0 denotes the mean of total income y_0 , and $F(y_0)$ denotes the cumulative distribution of total income y_0 . Then, G_0 can be rewritten as below,

$$G_0 = \sum_{k=1}^K \frac{\mu_k}{\mu_0} \cdot \frac{2Cov[y_k, F(y_k)]}{\mu_k} \cdot \frac{Cov[y_0, F(y_0)]}{Cov[y_k, F(y_k)]}$$

Here, denote $S_k = \frac{\mu_k}{\mu_0}$, as the share of component k with total income, denote $G_k = \frac{2Cov[y_k, F(y_k)]}{\mu_k}$ as the Gini coefficient corresponding to income component k, denote $R_k = \frac{Cov[y_0, F(y_0)]}{Cov[y_k, F(y_k)]}$ as the Gini correlation of component k with total income. Hence, the Gini coefficient for total income, can be represented as

$$G_0 = \sum_{k=1}^K S_k G_k R_k$$

Intuitively, S_k implies the weight of component k relative to total income, G_k implies the inequality within component k, and R_k implies the correlation of component k with total income. If R_k equals to zero, component k and total income are independent; if R_k is positive, component k flows disproportionately toward those at the top of the income distribution (i.e., favors the rich), if R_k is negative, component k tends to targets low income households (i.e., favors the poor).

Following Milanovic (1998) and Amarante (2016), we define the concentration index of component k as C_k , where $C_k = G_k \cdot R_k$. Then, the overall Gini coefficient can be rewritten as

$$G_0 = \sum_{k=1}^K S_k C_k$$

Box 2. Japan: Methodology for Factor Decomposition of the Gini Index (concluded)

where S_k represents a share effect, and C_k represents a concentration effect. Then the change of Gini coefficient can be written as

$$\Delta G_0 = \sum_{k=1}^K \Delta S_k C_k + \sum_{k=1}^K S_k \Delta C_k + \sum_{k=1}^K \Delta S_k \Delta C_k$$

where the first term shows the change of the Gini coefficient due to the change of the share effect, the second term shows the change of the Gini coefficient due to the change of the concentration effect, and the third term is the residual. Intuitively, for component k , if the concentration index C_k remains constant and is higher than average concentration index of all components $1, 2, \dots, K$, an increase in the share index S_k results in an increase in overall Gini coefficient G_0 . On the other hand, if the share index S_k remains constant, an increase in the concentration index C_k results in an increase in overall Gini coefficient G_0 .

Next, we analyze the marginal effect of changes in component k on overall Gini coefficient. We consider an exogenous change in component k by a factor of e , such that $y_k(e) = (1 + e)y_k$. Then, the partial derivative of the overall Gini coefficient G_0 with respect to e factor change of component k is described as below. (see (Stark and others, 1986))

$$\frac{\partial G_0}{\partial e} = S_k(G_k R_k - G_0)$$

Divided by G_0 , the marginal effect relative to the overall Gini coefficient G_0 is as below.

$$\frac{\partial G_0 / \partial e}{G_0} = \frac{S_k G_k R_k}{G_0} - S_k$$

The partial derivative equals to the original contribution of component k to income inequality minus component k 's share of total income. A negative sign of the marginal effect implies a marginal increase of the component k has an equalizing effect, that is, G_0 decreases.

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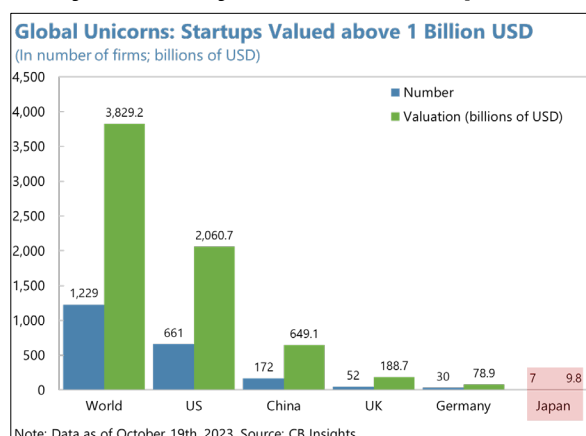
STARTUPS AND VENTURE CAPITAL IN JAPAN: HOW TO GROW¹

The startup ecosystem in Japan has seen gradual growth, supported by the government's recent "Startup Development Five-Year Plan" and a significant interest from overseas venture capital. This paper lays out the startup financing ecosystem in Japan, with comparison to international peers, and studies potential drivers of startup financing and their relevance for startups' performance. The results, based on country-level aggregate analysis, underscore the critical role of firm dynamism and entrepreneurship in supporting capital investment and firm valuations. Further analyses at the firm level suggest that equity funding helps startups innovate, grow, and successfully exit. Moreover, the impact of funding on the likelihood of a successful exit appears to be higher in cultures that seem to reward risk taking.

A. Introduction

1. Japan's startup ecosystem has grown gradually in recent years, but with scope for further expansion.

Startups in Japan tend to be smaller compared with those in the United States (U.S.), China, and the United Kingdom, with a relatively lower number of unicorns with valuation above US\$1 billion.² On venture capital (VC) funding, Tokyo has emerged to be a top 20 location for the VC ecosystem globally,³ with the largest share of startup funding in deep-tech research and development sectors. However, at the national level, Japan's venture capital equity funding remains relatively small as a share of GDP compared with peers.



2. The government continues to support startups and venture capital funding through the "Startup Development Five-Year Plan".

The plan focuses on three main pillars: 1) building human resources and networks for creating startups; 2) strengthening funding for startups and diversifying exit strategies; and 3) promoting open innovation.⁴ The authorities have set up

¹ Prepared by Salih Fendoglu (MCM) and TengTeng Xu (APD). We thank Kaustubh Chahande for excellent research assistance. We appreciate useful comments from Yan Carriere-Swallow and seminar participants at the Ministry of Finance of Japan.

² The number of unicorns in Japan stood at 7 in 2023, compared with 653 in the U.S. Similarly, the valuation of unicorns in Japan was about US\$9.8 billion in 2023, compared with US\$2 trillion in the U.S. See CB Insights, "[The Complete List of Unicorn Companies](#)". Anecdotal evidence suggests that Japanese startups tend to exit earlier than peers as it is relatively easy to raise funds through the Tokyo Stock Exchange, which may have contributed to the relatively lower number of unicorns.

³ See PitchBook (2023a), "Global VC Ecosystem Rankings".

⁴ See "[Startup Development Five-Year Plan](#)", Cabinet Secretariat.

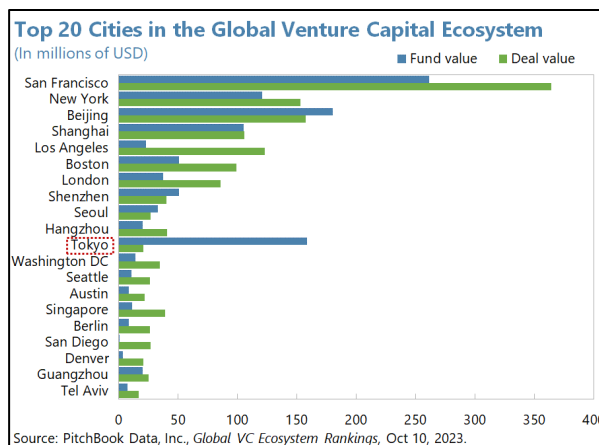
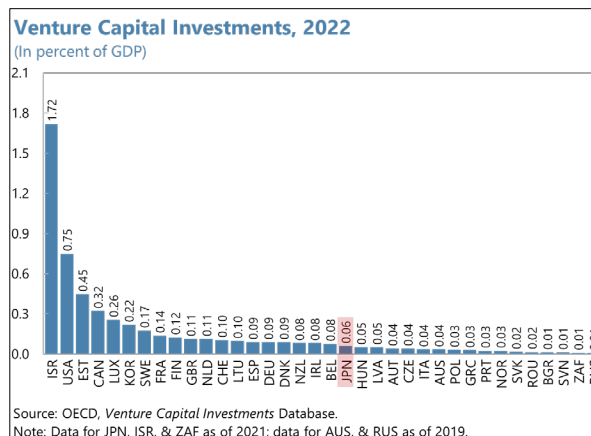
entrepreneur development hubs overseas and promoted startup incubators in central Tokyo, with close collaborations with universities. On financing, the Japan Investment Corporation launched a 200-billion-yen [venture growth fund](#) in 2023 to support later stage startups to create unicorns and to target early-stage startups beyond deep tech and life sciences.

3. This paper examines factors that support startups and venture capital funding.

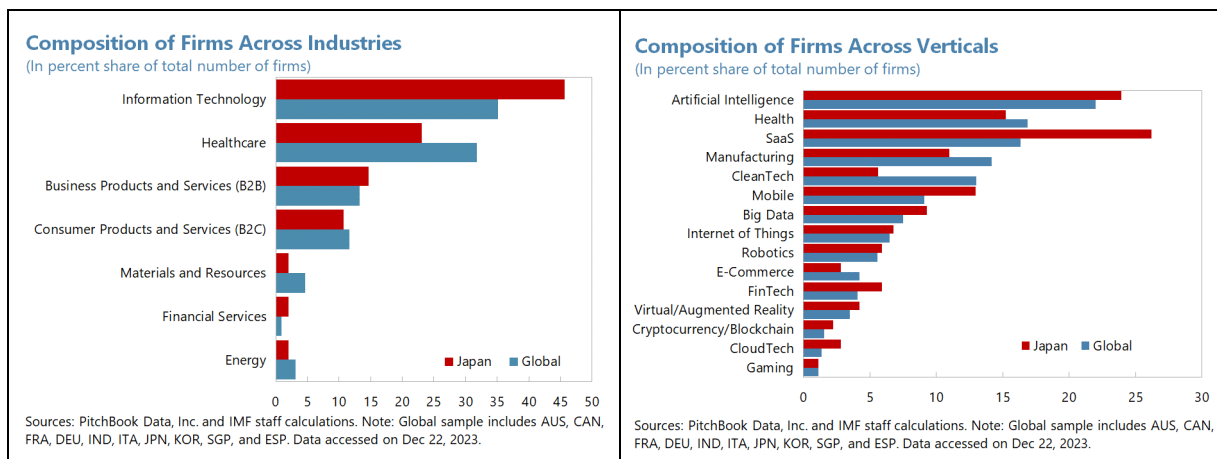
First, it explores the key characteristics of startups and their funding in Japan and compares with other leading countries for startups. Second, it conducts two sets of empirical analysis using a novel database for firms, including startups. In the first set, we examine how structural factors affect capital investment and valuations in firms more broadly in an aggregate cross-country analysis. In the second set, we conduct firm-level analysis on how equity funding determines the performance of startups.

B. Stylized Facts

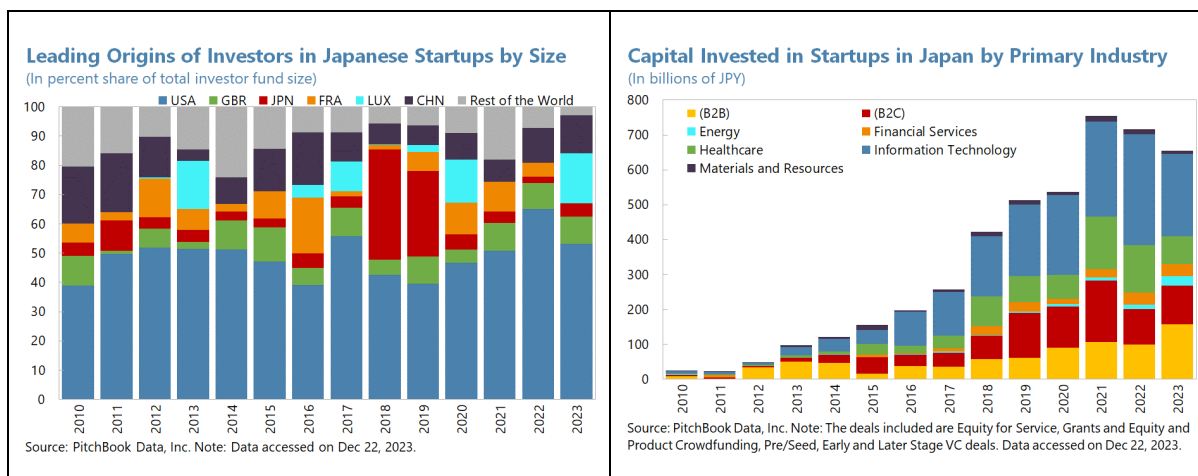
4. In recent years, Tokyo has emerged as a global VC hub. Tokyo is among the top 20 cities in the global VC ecosystem, based on rankings by PitchBook, which tracks startups and VCs globally. Tokyo ranks as the third city in terms of fund value, and relatively high in terms of deal value. The other leading cities tend to concentrate in the U.S., China, the U.K., and Korea. In Japan, the funding for startups tends to concentrate in the Tokyo metro area, accounting for about 80% of total funding.



5. The industrial composition of startups in Japan is similar to that in global peers. Based on firm-level data, most startups operate in the information technology (IT) sector, followed by health care, and business products and services (B2B). Using an alternative industry classification—“vertical” that spans various sectors—we reach a similar conclusion that the industrial composition of startups in Japan is similar to global peers. There are some subtle differences: the share of startups in IT or SaaS (Software-as-a-Service) appears somewhat higher in Japan than the global average. In Japan, CleanTech startups seem to be less prevalent than they are in the global sample.



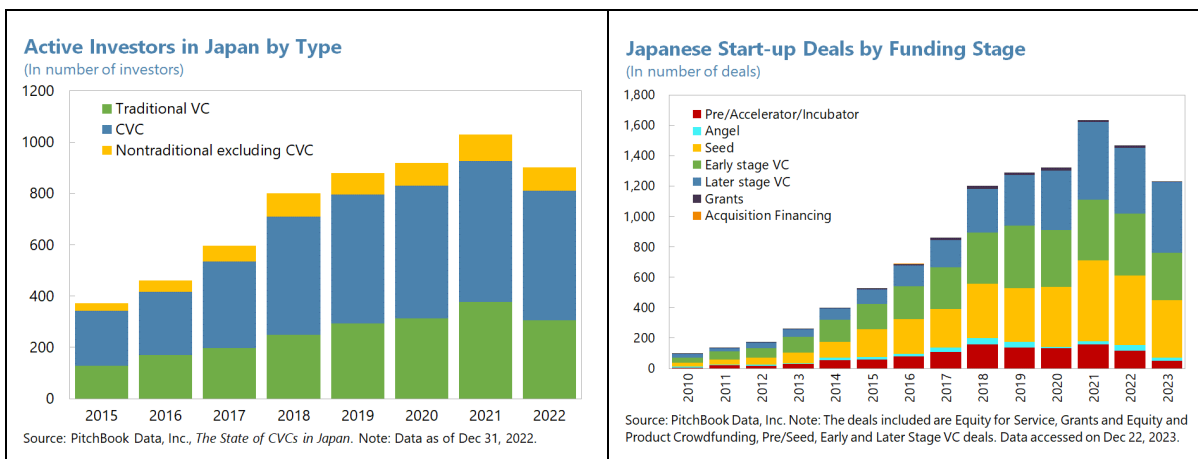
6. Most investors in Japan’s startups are from overseas. U.S. investors account for the major share in Japan’s startups, with their share at about 50 percent between 2010 and 2023. U.K. investors account for about 10 percent, while Japanese investors saw their share declining to about 5 percent in recent years. By sector, most of the capital is invested in startups in IT and health care, in which Japan has a comparative advantage. More recently, there has been a rise in capital invested in startups that focused on business products and services B2B and Business-to-consumer (B2C) industries.



7. An interesting aspect of VCs in Japan is the prevalence of corporate VCs or CVCs. Large Japanese corporations play an important role in funding startups through CVCs, utilizing their sizable stock of cash holdings. Between 2015 and 2022, Japanese CVCs invested in at least half of all VC deals in Japan, peaking at 62 percent in 2020.⁵ In terms of the stage of funding, most of the deals are in seed and early-stage VC, which may explain the relatively small size of Japanese startups.⁶ However, the share of funding for later-stage VC has increased in recent years.

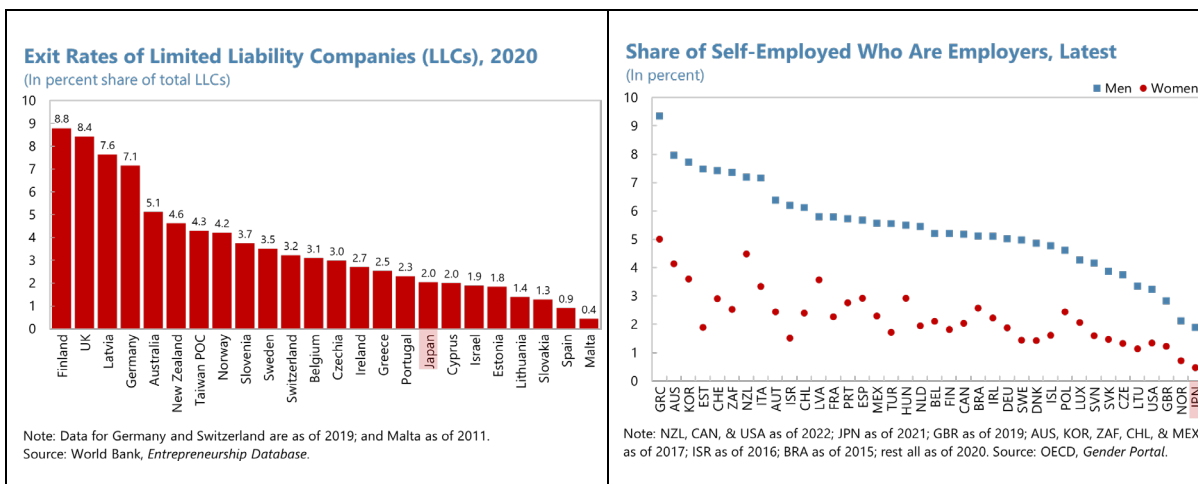
⁵ See PitchBook (2023b), “The State of CVCs in Japan”.

⁶ Anecdotal evidence also suggests that Japanese startups tend to exit earlier than peers as it is relatively easy to raise funds through the Tokyo Stock Exchange.



C. Aggregate Country-Level Analysis

8. We construct a cross-country aggregate database for 30 large advanced and emerging market economies. On firm performance, we rely on PitchBook, which is one of the most comprehensive databases on private markets globally, covering detailed information on capital investment and firm valuations. On macro and structural variables: we include GDP growth, inflation, firm dynamics, and entrepreneurship. Firm dynamics are captured by firm entry and exit rates and entrepreneurship is proxied by the share of self-employed who are employers. As can be seen below, Japan has a relatively low exit rate and low share of self-employed (who are employers) compared with other OECD countries. The time coverage of the database is from 2000 to 2022.



9. The key question in our empirical analysis is how country-specific macro and structural conditions affect the outcome for firms and financing at the aggregate level. We estimate a panel regression with capital investment and valuations as dependent variables, and country-specific macro and structural variables as independent variables. The panel regressions are estimated with the Arellano-Bover/Blundell-Bond linear dynamic panel data estimator with robust standard errors, specified as follows:

$$Y_{kt} = \alpha + \vartheta_k + \delta Y_{k,t-1} + \phi' X_{k,t-1} + \varepsilon_{kt}, \quad (1)$$

where Y_{kt} captures capital invested (mean) in firms or valuation (mean) of firms (millions of U.S. dollars) in country k at time t and X_{kt} captures country-specific macro and structural variables.

10. The results highlight the importance of firm dynamism and entrepreneurship in supporting capital investment and valuations in firms. On capital investment, we find that a higher share of entrepreneurship is associated with higher *capital investment* in firms in a country. Better firm dynamism (higher entry rate) is also associated with higher capital investment (Table 1). Similarly, a higher share of entrepreneurship is associated with higher *valuation* of firms at the country level, and better firm dynamism (higher entry and exit rates) are associated with higher valuation (Table 2).

Table 1. Cross Country: Capital Investment and Structural Characteristics

	Dependent variable: valuation (mean)				
Valuation (lagged)	-0.013 (0.02)	0.0883* (0.05)	0.0236 (0.05)	-0.00293 (0.02)	0.101*** (0.04)
Real GDP growth (lagged)	5.479 (5.60)	4.218 (5.20)	3.148 (4.56)	-0.335 (3.22)	3.363 (5.43)
Inflation (lagged)	6.924 (10.86)	-2.6 (7.61)	14.33 (10.39)	11.02 (10.41)	0.402 (4.87)
Entrepreneurship (lagged)	32.44* (17.12)	12.73 (24.95)			
Exit rate (lagged)	17.12 (12.84)		18.35* (9.78)		
Entry rate (lagged)				5.619* (3.09)	
Average job tenure (lagged)					-40.24 (47.13)
Constant	-256.4 (215.80)	111.8 (358.80)	135.9** (67.36)	195.1*** (45.60)	670 (459.30)
Observations	170	501	214	334	418

Table 2. Cross-Country: Valuations and Structural Characteristics

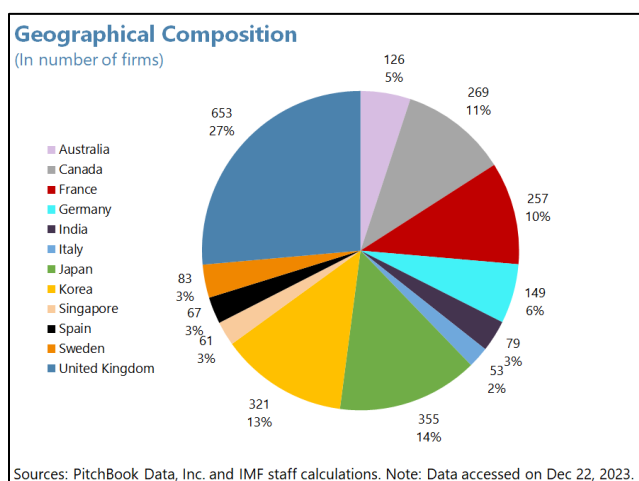
	Dependent variable: capital invested (mean)				
Capital invested (lagged)	-0.0399 (0.03)	0.0803** (0.04)	0.00502 (0.03)	0.0144 (0.03)	0.103*** (0.03)
Real GDP growth (lagged)	2.971* (1.55)	1.213 (2.30)	1.84 (1.20)	-0.806 (1.22)	-0.84 (1.67)
Inflation (lagged)	5.828 (5.92)	1.729 (2.99)	4.605 (4.26)	2.663 (3.11)	-1.688 (1.74)
Entrepreneurship (lagged)	17.37*** (3.98)	15.40*** (5.94)			
Exit rate (lagged)	5.996 (5.23)		4.595 (3.91)		
Entry rate (lagged)				9.061* (5.28)	
Average job tenure (lagged)					-30.86 (25.25)
Constant	-154.1*** (54.54)	-100.4 (82.77)	71.33*** (23.69)	16.48 (41.25)	432.2* (254.40)
Observations	170	501	214	334	418

D. Firm-Level Analysis

11. We now take a complementary view and explore the impact of funding on startups' performance by utilizing firm-level data. It is empirically challenging to properly measure the impact of early-stage funding on startups' subsequent performance. This is mainly because angel or venture capital investors select firms that they assess to have the greatest potential to grow, as they seek to maximize returns (see, for example, Kerr and others, 2014, about the detailed screening process used by angel investors in California). This identification challenge is well-known in the literature (see, for example, Kerr and others, 2014; Puri and Zarutskie, 2012; Akcigit and others, 2022; and references therein). Several empirical strategies have been proposed to address it, including matching funded and unfunded firms and the use of detailed firm-level data—if not more granular, for better identification—that provides information about funding details (for example, timing and volume of funding) along with firm characteristics (for example, size and industry) and performance indicators (for example, patents, total employees, and exit timing). Here, we follow a similar route, where we employ coarsened exact matching to reduce potential gaps in observables across firms, and a standard endogenous treatment model to reflect the possibility that startups' quality may drive both the availability of funding and their subsequent performance.

12. The firm-level data is first narrowed down to startups. PitchBook provides detailed

information about nearly 4 million companies globally, over 2 million deals, and 5,000 investors (as of end-2023). We limit the sample to startups, defined as companies that are young (less than 10 years old) and backed by any early-stage funding (venture capital, accelerator/incubator, or angel) at least once over its life cycle. We further limit the sample to those with non-missing information on several key characteristics that are used in the empirical model discussed below. The final sample includes startups from 12



countries for which the coverage (number) of startups is the largest, namely, Australia, Canada, France, Germany, India, Italy, Japan, Korea, Singapore, Spain, Sweden, and United Kingdom.⁷ The data is as of end-2023.

13. The estimation equation is as follows:

$$Outcome_i = \beta X_i + \delta WellFunded_i + \varphi_{country,sector} + \epsilon_i \quad (2)$$

⁷ The US is excluded due to data limitations.

where $Outcome_i$ is a set of performance indicators of startup i : log of total patent documents, log of number of employees, and the exit probability.⁸ $WellFunded_i$ is a dummy variable that takes a value 1 if total capital raised per employee by startup i is above the country-industry median, and 0 otherwise.⁹ X_i denote the set of firm controls, in particular firm age and number of employees.¹⁰ $\varphi_{country,sector}$ are country-sector fixed effects, which help to identify within country-industry variation. Standard errors are clustered at the country level. Note that there is no time dimension, as we have cross-sectional information (as of end-2023).

14. The availability of funding, $WellFunded_i$, is treated as endogenous in the estimation.

As noted in 110, we would like to account for the fact that unobservables, for example, entrepreneurial ability or ambition, could drive both the outcome and the availability of funding (by how much investors would be interested in investing in the startup). To this effect, we assume that $WellFunded_i$ depends on the number of active investors in startup i , as a proxy for how promising the startup is in the spirit of Kerr and others (2014). $WellFunded_i$ is assumed to depend also on the number of years since the first and last fund raising due to the fact that the underlying data is cross-sectional. That is, we are able to observe only a snapshot of firms at a given time (end-2023) and there are differences across firms in the time that has passed since funding. The procedure allows error terms in equation (2) to be correlated with the auxiliary regression that links $WellFunded_i$ to its determinants:

$$WellFunded_i = \beta Z_i + u_i, \quad (3)$$

where Z_i denote (i) total number of active investors, (ii) years since the first funding, and (iii) years since the last funding, for start-up i , and the test statistic for the null hypothesis, $cov(\epsilon_i, u_i) = 0$ has a χ^2 distribution.

15. The key hypothesis is that funding has a positive impact on the outcomes for startups ($\delta > 0$). That is, we study whether startups that have total capital raised per employee above the country-industry median perform better than the startups that are less funded. Due to data limitations, we are not able to take a particular funding round as the starting point and track the evolution of the performance of funded and non-funded startups, as typically done in the related literature (see, for example, Akcigit and others, 2022). This said, by focusing on startups that receive at least some funding, we are in principle able to reduce potential differences across the “treated” (well-funded) and “control” (not well-funded) set of firms. Moreover, to further reduce potential

⁸ The available firm-level data does not include information about firm exits (e.g., whether or when a firm exited and in what form), and in effect, is available for only non-exited firms (as of end-2023). To be able to study the potential impact of the availability of funding on the likelihood that a startup exits successfully, we use the probability of exit (via IPO or M&A) as reported by PitchBook. Based on proprietary data, PitchBook leverages several granular variables and uses machine learning techniques to estimate the probability of exit (via IPO or M&A) for each individual firm.

⁹ The results are broadly robust to choosing different thresholds, e.g., choosing startups with total capital raised per employee above the 75th percentile of the country-industry as “well-funded” and those below the 25th percentile as not “well-funded” do not affect the results materially, though the sample size drops notably.

¹⁰ For the specification that has the number of employees as the outcome variable, number of employees is dropped from the set of control variables X_i .

differences across firms, we employ coarsened exact matching (Iacus and others, 2012; Blackwell and others, 2009). In particular, we match each well-funded startup with a non-well-funded startup in the same country and industry that has the same age and number of employees.¹¹

16. The results suggest that the availability of funding can improve startups' performance (Tables 3 and 4).

Based on the global sample, we find that well-funded startups have higher number of total patent documents, are larger, and have higher exit probabilities (via initial public offering (IPO) or merger and acquisition (M&A)) (Table 3). The results are not only statistically significant but also economically relevant. For instance, well-funded startups are predicted to have 1.5 times more employees and exit with 43 percentage points higher probability, compared to non-well-funded startups. The results also confirm potential endogeneity of well-fundedness, where the p-value of the null hypothesis of uncorrelated errors terms in the main and auxiliary regressions is strongly rejected in the majority of the specifications (the p-value of the χ^2 statistic reported in the last row of the upper panel of Table 3). Moreover, as documented in the lower panel, the number of active investors is statistically significant in predicting whether a startup is well-funded or not. Finally, these results hold qualitatively for the sample focusing only on Japan (Table 4). For the Japan sample, the impact of availability of funding on the number of patents seems larger and is more precisely estimated, while the estimated impact on other outcome variables does not seem to be materially different.

17. We next explore whether cross-country differences in risk-taking culture also matters.

To explore whether heterogeneity across countries in risk-taking culture matters, we augment the main empirical model:

$$Outcome_i = \beta X_i + \delta WellFunded_i x Y_{country} + \varphi_{country,sector} + \epsilon_i, \quad (3)$$

where $Y_{country}$ denotes a set of country-level variables reflecting proxies for cultural differences as measured by Hofstede (2013), namely (i) uncertainty avoidance, reflecting a society's tolerance for uncertainty and ambiguity; and (ii) power distance, reflecting how much a society delegates power to a person of authority and expect and accept that the power is distributed unequally. We expect a greater positive impact of the availability of funding on startup performance in countries that reward risk-taking behavior. The results suggest that risk-taking culture indeed matters. In particular, the predicted impact of the availability of funding on the exit of a startup is higher in countries with less uncertainty avoidance (for IPO exit) and with less power distance (for M&A exit).

18. The results should be read with some caveats, in large part due to data limitations.

First, we were not able to track startups' performance following funding rounds, given that the data is cross-sectional. Second, we study a particular vintage of the data, i.e., end-2023, that includes surviving startups. The data for firms that had exited before end-2023 is not available, hence there remains survivor bias –though it is not evident if the bias would be in a particular direction. Third, we

¹¹ Two-sided t-test of means for treated and control samples imply (i) for age, a p-value of 0.05 before matching and 1.00 after the matching; (ii) for total number of employees, a p-value of 0.003 before matching and 0.42 after matching. Matching drops 13 percent of the firms in the final sample.

study the impact of the availability of funding, and do not explore to what extent the cost or the conditionality of funding or the type of investors would matter, similarly due to data limitations. Moreover, the estimated impacts are identified within country-industry, mainly to sharpen the identification, but this comes at the expense of overlooking potential variation across countries and/or industries. Finally, the analysis does not shed light on whether private equity funding is a complement or substitute to other types of financing (for example, debt financing). This said, exploiting country-industry variation in the identification strategy in part mitigates potential bias due to omitting other potential sources of funding.

Table 3. Global: Does Availability of Funding Affect Startup Performance?

	Dependent Variable				
	log(patent docs)	log(# employees)	exit	IPO	MA
Well-Funded	0.744*	1.540***	43.848***	14.500***	39.903***
	(0.408)	(0.171)	(1.774)	(3.108)	(1.819)
log (# employees)	0.159***		11.635***	4.833***	7.229***
	(0.030)		(0.471)	(0.409)	(0.689)
log(age)	0.677***	0.285***	-6.517***	-0.237	-7.174***
	(0.041)	(0.105)	(1.174)	(0.770)	(1.116)
Observations	1,854	1,854	1,854	1,854	1,854
chi2 - p-value (rho=0)	0.328	0	0	0	0

	Treatment Variable = Well-Funded				
	log(patent docs)	log(# employees)	exit	IPO	MA
# Active Investors	0.033***	0.064***	0.035***	0.041***	0.026***
	(0.007)	(0.006)	(0.007)	(0.008)	(0.006)
Years since first funding	0.045***	0.018	0.035***	0.029**	0.040***
	(0.010)	(0.012)	(0.008)	(0.011)	(0.008)
Years since last funding	-0.124***	-0.108***	-0.356***	-0.138***	-0.305***
	(0.026)	(0.026)	(0.024)	(0.024)	(0.023)
Observations	1,854	1,854	1,854	1,854	1,854

Table 4. Japan: Does Availability of Funding Affect Startup Performance?

	Dependent Variable				
	log(patent docs)	log(# employees)	exit	IPO	MA
Well-Funded	3.443***	0.848***	51.863***	23.050***	46.359***
	(0.283)	(0.173)	(3.026)	(2.172)	(5.190)
log (# employees)	0.057		11.802***	4.750***	7.187***
	(0.073)		(1.083)	(0.955)	(1.269)
log(age)	0.730***	0.575***	-3.726	1.739	-7.524**
	(0.214)	(0.141)	(3.613)	(2.174)	(3.339)
Observations	302	302	302	302	302
chi2 - p-value (rho=0)	0	0	0	0	0

	Treatment Variable = Well-Funded				
	log(patent docs)	log(# employees)	exit	IPO	MA
# Active Investors	0.001	0.054***	0.018**	0.011	0.011
	(0.006)	(0.009)	(0.009)	(0.010)	(0.011)
Years since first funding	-0.016	0.040	0.057*	0.085**	0.045
	(0.027)	(0.040)	(0.030)	(0.037)	(0.038)
Years since last funding	-0.080*	-0.146***	-0.432***	-0.237***	-0.307***
	(0.041)	(0.054)	(0.047)	(0.050)	(0.064)
Observations	302	302	302	302	302

Table 5. Global: Does Risk Culture Matter for Startup Exit?		
Country Characteristic:	Dependent Variable: Successful Exit	
	Uncertainty Avoidance	Power Distance
Well-Funded	46.022*** (1.484)	48.184*** (1.412)
Well-Funded * Country Characteristic	-1.617 (1.671)	-4.376*** (1.138)
log (# employees)	11.999*** (0.459)	12.090*** (0.428)
log(age)	-3.198** (1.452)	-3.230** (1.463)
Observations	1,854	1,854
chi2 - p-value (rho=0)	0	0
Dependent Variable: IPO Exit		
Country Characteristic:	Uncertainty Avoidance	Power Distance
Well-Funded	16.574*** (4.084)	11.204*** (2.660)
Well-Funded * Country Characteristic	-5.241** (2.178)	2.344 (1.957)
log (# employees)	4.293*** (0.446)	4.221*** (0.459)
log(age)	-3.943*** (1.266)	-4.065*** (1.388)
Observations	1,854	1,854
chi2 - p-value (rho=0)	0.00360	0.00285
Dependent Variable: MA Exit		
Country Characteristic:	Uncertainty Avoidance	Power Distance
Well-Funded	40.367*** (3.285)	48.153*** (2.244)
Well-Funded * Country Characteristic	2.514 (3.479)	-7.293*** (1.496)
log (# employees)	8.005*** (0.755)	8.158*** (0.706)
log(age)	-0.920 (2.123)	-0.680 (2.072)
Observations	1,854	1,854
chi2 - p-value (rho=0)	0	0

E. Policy Implications

19. In line with international experience, our results highlight the importance of equity funding in supporting startups to grow and eventually exit in Japan. Better access to equity funding is crucial for startups to grow, innovate, and exit successfully. Angel or venture capital investment not only provides startups with private equity financing when they do not have access to capital markets, bank loans, or other debt instruments at the early stage of their businesses, but also offers value-added services (for example, operational and market insights).

20. A more flexible labor market is crucial for entrepreneurship and innovation. A gradual shift away from the lifelong employment system could encourage talented individuals to consider setting up startups and to have a second chance in case they fail. Reducing labor-market dualism, encouraging merit-based promotions, and facilitating more job mobility can also encourage entrepreneurship, which is associated with higher capital investment and firm valuations at the country level.

21. Greater firm dynamism can help support startups and innovation. Dynamic firm entry and exit and reduced personal liabilities can also encourage entrepreneurship, innovation, and more efficient allocation of resources. For example, a gradual reduction of zombie firms could help improve the allocation of capital and labor to more productive ventures, boosting productivity and growth.

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