Can "work-from-home" reshape the work and home environment in Japan?

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Abstract

Due to an increase in the adoption of the "work-from-home" policy in many organisations worldwide, including Japan, this study investigated the causal relationship between remote work, work hours, and household production among workers in Japan. Revisiting the Milgram experiments, this study hypothesised that remote work could provide significant psychological distance between employee and their physical workplace, which hinder employer and peer pressure on employees. As a result, employees may reduce unnecessary work hours and increase household production. I performed panel data analysis on post-pandemic datasets from Osaka University's Preference Parameter Study and found that remote work reduces work hours among workers in Japan. However, only men with remote work reduced their unpaid work hours. Furthermore, the effects of remote work on household production are statistically insignificant.

JEL Classification: D13, I14, J22, J28, M14

Keywords: Remote work, Overwork, Labour supply, Household production, Time allocation, Japan

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Introduction

Japan is one of the OECD countries with the highest market work hours (OECD, n.d.). Its collective culture, input-oriented attitude, job ambiguity, and internal hiring practice pressured workers in Japan to have long work hours (Ono, 2018). As a result, some workers suffered physical or mental illnesses (Iwasaki et al., 2006; Ke, 2012; Yuktadatta et al., 2023). In severe cases, workers with these work-induced illnesses succumbed to "Karoshi" or "Death by overworking" (Gorvett, 2016; Kanai, 2008; Ke, 2012; Nishiyama & Johnson, 1997). Revisiting the Milgram experiments (1963; 1974), remote work might alleviate the work hours issues in Japan. Since remote work provides significant physical and psychological distance between employees and their workplaces, workers may experience less pressure from their supervisors and colleagues to work longer than necessary. Meanwhile, the gender division of labour led to unbalance work hours between male and female workers in Japan (Ono, 2018; OECD, 2017; OECD, n.d.). Therefore, male and female workers may benefit from remote work differently and spend their saved time differently. Some might spend on leisure (Aksoy et al., 2023), while others may spend on other non-market work. As a result, this study explored the effects of remote work on time spent on work and household production. The study also examined the associations between gender and such effects.

Japan has experienced a decline in work hours since 2012 (MHLW, 2021). Regardless, the decline was not mainly attributed to reforms in labour protection laws (Chor, 2017; Demetriou, 2020; Fleming, 2018; Takami, 2019) but rather the influx of female part-time workers (BBC, 2018; Takami, 2019). As a result, Japan still ranked highly in market-work hours among OECD countries (OECD, n.d.). It ranked the second highest in male market-work hours and fourth highest in female market-work hours (OECD, n.d.). Japanese-style employment systems, such as collective culture and job ambiguity, created pluralistic ignorance (Ono, 2018), which pressured workers to follow harmful work norms, i.e., overwork. On the other hand, other employment attributes, such as the gender division of labour, exacerbated the pressures (Ono, 2018). According to OECD (n.d.), Japanese men performed market work 1.66 times longer than women, whereas Japanese women performed non-market work 5.5 times longer than men. This rigid division of labour stemmed from conservative gender roles, the single-income household model, and toxic masculinity (Ikeda, 2019; Ono, 2018; Ishizaka, 1973). This division obstructed women's progression in their careers. Owing to responsibilities at home, women could not commit to working as much as men (Nemoto, 2013). Therefore, women were less likely to be promoted, especially after having a child (Kawase et al., 2021; Kawaguchi, 2019; McCurry, 2015). Meanwhile, a household might

observe female labour market outcomes. Then, the household might make a joint gender-based decision to decrease female market work hours and simultaneously increase male market work hours. As a result, the division of labour was sustained through a self-fulfilling prophecy and exacerbated pressure on men to work longer.

Fortunately, remote work may alleviate market work pressure on men and allow the household to recalibrate its decision on the division of labour. Reassessing the Milgram experiment (1963; 1974) and its following experiments (Bandura, 2006; Caspar et al., 2016; Wegner, 2002), remote work helps increase the physical and psychological distance between workers and their supervisors. Remote work also allows workers to reduce their interaction with their colleagues. These attributes of remote work can hinder supervisors' pressure on workers and impede the effect of pluralistic ignorance on overwork. Hence, workers may preserve a sense of agency and avoid overwork, in this study, reducing unpaid overtime. Ultimately, they are less likely to feel stress (Shimura et al., 2021), have more enthusiasm and higher job satisfaction (Felstead and Henseke, 2017), and have better physical health (Angelucci et al., 2020). Besides reducing unnecessary work, remote work reduced commuting time per week, enabling workers to reallocate their time to caregiving and leisure (Aksoy et al., 2023). The time saving may also allow breadwinners in Japan, especially men, to reallocate their time to housework, as witnessed in the U.S. (Felstead and Henseke, 2017).

We used the Milgram experiment framework (1963; 1974) to ask whether remote work can discourage overwork issues in Japan. Although Felstead and Henseke (2017) found the opposite results in the U.S., we argued that Japan's specific cultural setting and employment styles (Merchant, 2018; Kanai, 2009; Ono, 2018; Takami, 2019) distinguish the labour market in Japan from those in Western countries. Meanwhile, a previous study in Japan (Aksoy et al., 2023; Shimura et al., 2021) failed to observe the direct effect of remote work on both market and non-market work hours in Japan. Therefore, this study has some contributions. Academically, this study is among the first studies to investigate the effects of remote work on time spent on market work and non-market work among workers in non-Western countries. It is also among the first to examine associations between gender and the effects of remote work. The study also provided policy recommendations to alleviate overwork issues in Japan.

This paper consisted of six sections, which were arranged in the following manners: introduction, data, methodology, results, discussion, and conclusion.

Data

This study utilised 2021 and 2022 datasets from Osaka University's Preference Parameter Study (PPS). The PPS is a panel survey, which collected socioeconomic and preference data annually since 2003 while maintaining representativeness. However, the study did not collect remote work information until 2020. As a result, the study used datasets from 2021 and 2022. The following is the definition of variables used in this study.

<Table 1: Variable definitions>

This study consisted of 1,851 observations. According to the summary statistics in Table 2, 53.86% of this sample were men, and 25.5% lived in the government's designated city. The summary statistics also revealed that the average subject aged around 56 years and 5 months old. They had an education of 13 years and 9 months. Regarding work, 55.48% of the sample were full-time employees, and 51.81% worked in an occupation that required face-to-face communication. 12.16% of the sample worked remotely. Furthermore, an average subject worked 38 hours and 21 minutes. They spent 34 hours and 31 minutes per week on regular work, 1 hour and 50 minutes per week on paid overtime, and 2 hours per week on unpaid overtime. In terms of household production, they spent 13 hours and 40 minutes per week on average.

<Table 2: Summary statistics>

Methodology

Since this study asked whether remote work could reduce unnecessary work hours and increase household production, I performed panel regression analysis on the following models.

$$Y_{i,j} = f(R_i, X_i, \varepsilon_i)$$

where $Y_{i,j}$ represents the spent hour of the i th individual in j activity. j ranges from 1 to 5; 1 implies total market work, 2 implies market work, 3 implies paid overtime, 4 implies unpaid overtime, and 5 implies housework. R represents the remote work variable. X represents control variables, and ε defines an error term.

Results

Owing to the panel datasets, the Hausman test was performed to select suitable models for explaining the relationship between remote work and interested dependent variables. The

test results are available upon request. Random effect models are preferred to within-effect models.

Meanwhile, the panel analysis results are shown in Table 3. The results suggested that remote workers worked at least 3 hours and 21 minutes less than non-remote workers. The decrease causes reduced hours spent on market work and unpaid overtime. Remote workers spent less time on market work by at least 2 hours and 40 minutes and less on unpaid overtime by at least 42 minutes. The results also revealed a negative relationship between remote work and paid overtime. Regardless, the effects of remote work on paid overtime are statistically insignificant. Most estimates are robust and consistent when comparing estimates across models (pooled OLS models, GMM random effect models, and MLE random effect models) and comparing estimates from estimated models with different sets of control variables. Only the estimates of remote work on housework are statistically insignificant and inconsistent.

<Table 3: Results of regression analysis>

Owing to gender segregation in the labour market (OECD, n.d.; OECD, 2017; Ono, 2018), male and female workers may experience the effect of remote work differently. Hence, a subsample analysis was performed, and the results are provided in Table 4. The results revealed that remote male workers worked 3 hours and 51 minutes less than male non-remote workers. This reduction stemmed from the decrease in market work hours and the reduction in unpaid overtime work hours. Like male workers, remote female workers worked 3 hours and 1 minute less than their female counterparts. However, this reduction solely stemmed from the decrease in market work hours. In terms of housework, male and female remote workers are more likely to increase their time doing housework by roughly 40 and 20 minutes, respectively. Regrettably, the incremental times are statistically insignificant.

<Table 4: Subsample analysis results by gender>

Discussion

Overall, this study is inconsistent with Felstead and Henseke (2017), who found a positive effect of remote work on overtime work and housework. These differences supported consensus on the difference in work cultures and environments between Japan and western countries (Merchant, 2018; Kanai, 2009; Ono, 2018; Takami, 2019). Since the results indicated a negative relationship between remote work and unpaid work hours, remote work may solve an overwork problem in Japan. Revisiting the Milgram experiment and subsequent studies

(Bandura, 2006; Caspar et al., 2016; Milgram, 1963, 1974; Wegner, 2002), remote work may create a psychological distance between workers and their workplace. As a result, workers experienced less pressure to work overtime.

Expectedly, the effects of remote work on unpaid work are varied across gender. This disparity across gender underlines the issues of gender inequalities in the Japanese labour market. Owing to the perception of traditional gender roles, women in Japanese households are expected to be homemakers, and they are expected to leave their work after getting married (Kawase et al., 2021; Kawaguchi, 2019; McCurry, 2015, Ono, 2018). With the stagnant growth in childcare services, women with new-born may have trouble returning to work (Chunichi Shimbun, 2022, Kawase et al., 2021; Kawaguchi, 2019; McCurry, 2015, Ming, 2018). Therefore, female workers can be perceived as temporary and disloyal (Mahoney, 2020). Investing in them may also be perceived as wasteful, as a low number of women in management positions suggested (Bala, 2021). These perceptions may put women under more scrutiny than men and ultimately pressure female workers to work longer than their male counterparts. As a result, remote work has less influence on female workers.

Consistently, the effects of remote work on market work hours illustrated gender inequality in Japan. During the pandemic, workers may be forced to work remotely to curb the spreading of COVID-19 (Kawaguchi et al., 2022). Meanwhile, some workers may be forced to work remotely as a cost-cutting measure. This cost-cutting measure also led to a reduction in regular work hours. As a result, remote workers worked less than non-remote workers. Regardless, remote work's negative effect on market hours is more prominent among female workers. Since women were more likely to work in temporary positions than men (Kikuchi et al., 2021; Kotera and Schmittmann, 2022), many companies did not renew their contracts during the pandemic as a cost-cutting measure (Kikuchi et al., 2021; Ishibashi and Nakafuji, 2020; Yamamitsu and Sieg, 2020). Even though some women worked full-time, many worked in supporting roles (Ono, 2018). Therefore, companies could reduce these women’s work hours while maintaining operations. Optimistically, these uneven effects disrupt households’ division of labour in Japan. Since men tended to benefit from remote work more than women, they were more likely to reallocate their time to household production. As a result, remote work might be a solution to the household division of labour, one of the contributors to the overwork culture in Japan.

This study has limitations. The Preference Parameter Study (PPS) recently started to collect information on remote work in their 2021 and 2022 survey. Since we could not utilise previous waves in our analysis, we could not observe the effect of remote work on market and

non-market work hours before the pandemic. We could not also investigate the Ashenfelter's dip. On the other hand, since waves of the PPS were conducted during the COVID-19 economic crisis, there is a possibility that this ongoing stagnation influenced work hours. As a result, our results could be biased. Further studies may be needed to address these issues. Regardless, this study's findings are consistent with the current Japanese labour market narrative.

Conclusion

Distinctive features of the Japanese labour market, such as collective culture, input-oriented attitude, job ambiguity, and internal hiring practice, pressured workers in Japan to work overtime (Ono, 2018). As a result, Japan is one of the OECD countries with the highest market work hours (OECD, n.d.). Revisiting the Milgram experiments (1963; 1974), this study hypothesised that remote work could provide significant physical and psychological distance between employees and their workplaces. Workers might experience less pressure to work overtime and reduce their work hours accordingly. Expectedly, this study found a negative relationship between remote work and unpaid work hours. Regardless, the sub-sample analysis revealed that only male workers benefited from remote work. Since women were under more scrutiny than men (Chunichi Shimbun, 2022, Kawase et al., 2021; Kawaguchi, 2019; McCurry, 2015, Ming, 2018) and attempted to define gender stereotypes at work, they might feel pressure to work longer than male counterparts. Due to these different effects magnitudes, remote male workers spent 40 minutes more on housework, whereas their female counterparts spent only 20 minutes more.

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Table 1: Variable definitions

Variable	Definition
Dependent variables	
Total market work	Continuous variable: the total number of weekly market work hours, including paid and unpaid overtime work hours.
Market work	Continuous variable: the total number of regular work hours per week.
Paid overtime	Continuous variable: the total number of paid extra work hours per week.
Unpaid overtime	Continuous variable: the total number of unpaid extra work hours per week.
Housework	Continuous variable: the total number of hours spent doing housework per week.
Main explanatory variable	
Remote work	Binary variable: coded 1 if a subject works remotely at least once a week, 0 if otherwise.
Controls variables - Demographic and household characteristics	
Male	Binary variable: coded 1 if a subject is male, 0 if otherwise.
Age	Continuous variable: a subject's age as of January 2022.
Age squared	Continuous variable: square of subject's age
Designated city	Binary variable: coded 1 if a subject lives in the government's designated city, 0 if otherwise.
Yrs of education	Discrete variable: years of schooling.
HH members	Discrete variable: number of household members.
Breadwinner	Binary variable: coded 1 if a subject earned a higher income than their spouse or partner.
Spouse	Binary variable: coded 1 if a subject has a spouse or a partner, 0 if otherwise.
Child	Binary variable: coded 1 if a subject has at least one child, 0 if otherwise.
Controls variables - Work and financial characteristics	
FT employed	Binary variable: coded 1 if a subject is a full-time employee, 0 if otherwise.
Management	Binary variable: coded 1 if a subject works in the management position, 0 if otherwise.
Face-to-face	Binary variable: coded 1 if a subject has an occupation which requires in-person contact.
Non-performance	Binary variable: coded 1 if a subject's salary is not based on the subject's performance.
HH income	Continuous variable: annual household income in Japanese Yen (JPY).
log (HH income)	Continuous variable: log of annual household income.
HH assets	Continuous variable: the value of household assets in JPY.
log (HH assets)	Continuous variable: log of household assets.
HH house loan	Discrete variable: level of household house loan in JPY.
HH other loans	Discrete variable: level of household other loans in JPY.

Table 2: Summary statistics

Variable	Mean	Std. Dev.	Min	Max
Dependent variables				
Total market work	38.3652	14.3458	1	100
Market work	34.5105	12.3704	0	100
Paid overtime	1.8341	4.1384	0	30
Unpaid overtime	2.0205	4.9484	0	40
Housework	13.6653	13.4737	0	115
Main explanatory variable				
Remote work	0.1216	0.3269	0	1
Controls				
Male	0.5386	0.4986	0	1
Age at Jan 2022	56.4084	9.8373	32	87
Age squared	3278.6310	1107.0350	1024	7569
Designated city	0.2550	0.4360	0	1
Yrs of education	13.7688	2.0366	9	21
HH members	3.1626	1.3036	1	10
Breadwinner	0.5084	0.5001	0	1
Spouse	0.8055	0.3959	0	1
Child	0.8449	0.3621	0	1
FT employed	0.5548	0.4971	0	1
Management	0.0681	0.2519	0	1
Face-to-face	0.5181	0.4998	0	1
Non-performance	0.4716	0.4993	0	1
HH income	7,244,679	4,346,689	800,000	25,000,000
log (HH income)	15.6194	0.6200	13.5924	17.0344
HH assets	17,800,000	28,100,000	2,500,000	200,000,000
log (HH assets)	16.0479	1.0717	14.7318	19.1138
HH house loan	1.3857	2.2960	0	8
HH other loans	0.9298	1.8010	0	8

Note: This study comprised 1,851 observations. This table provided the summary statistics of variables used in this study.

Table 3: Results of regression analysis

Dependent variables	Model	Explanatory variables			Obs.	Chi2 statistics	p-value
		Interest	Controls				
		Remote work	Demographic & household char.	Work & financial char.			
Total market work	Pooled OLS	-3.893*** (0.893)	No	Yes	1,851	832.8	0
		-3.719*** (0.675)	Yes	Yes	1,851	1209	0
	GMM - Random effect	-3.471*** (0.776)	No	Yes	1,851	237.7	0
		-3.353*** (0.793)	Yes	Yes	1,851	723.3	0
	MLE - Random effect	-3.491*** (0.873)	No	Yes	1,851	222.2	0
		-3.368*** (0.830)	Yes	Yes	1,851	968.6	0
Market work	Pooled OLS	-3.116*** (1.017)	No	Yes	1,851	389.2	0
		-2.864*** (0.732)	Yes	Yes	1,851	937.6	0
	GMM - Random effect	-2.863*** (0.874)	No	Yes	1,851	290.3	0
		-2.666*** (0.840)	Yes	Yes	1,851	612.1	0
	MLE - Random effect	-2.880*** (1.027)	No	Yes	1,851	259.8	0
		-2.679*** (0.807)	Yes	Yes	1,851	1330	0
Paid overtime	Pooled OLS	-0.0749 (0.349)	No	Yes	1,851	213.9	0
		-0.0771 (0.306)	Yes	Yes	1,851	356.1	0
	GMM - Random effect	-0.00794 (0.288)	No	Yes	1,851	99.57	0
		-0.00242 (0.325)	Yes	Yes	1,851	256	0
	MLE - Random effect	-0.00412 (0.335)	No	Yes	1,851	107.4	0
		0.00199 (0.261)	Yes	Yes	1,851	236.1	0
Unpaid overtime	Pooled OLS	-0.702** (0.317)	No	Yes	1,851	129.2	0
		-0.778** (0.307)	Yes	Yes	1,851	230.6	0
	GMM - Random effect	-0.698** (0.282)	No	Yes	1,851	104.9	0
		-0.769** (0.316)	Yes	Yes	1,851	271.5	0

Dependent variables	Model	Explanatory variables			Obs.	Chi2 statistics	p-value
		Interest	Controls				
		Remote work	Demographic & household char.	Work & financial char.			
Unpaid overtime	MLE - Random effect	-0.697** (0.289)	No	Yes	1,851	122.1	0
		-0.769** (0.386)	Yes	Yes	1,851	170.4	0
Housework	Pooled OLS	-0.582 (0.863)	No	Yes	1,851	306.9	0
		1.026 (0.679)	Yes	Yes	1,851	2603	0
	GMM - Random effect	-0.557 (0.798)	No	Yes	1,851	88.51	0
		0.536 (0.667)	Yes	Yes	1,851	2486	0
	MLE - Random effect	-0.556 (0.551)	No	Yes	1,851	112.4	0
		0.555 (0.598)	Yes	Yes	1,851	942.9	0

Note: This table provided the regression results of remote work on our interested dependent variables: total market work hours, market work hours, paid overtime work hours, unpaid overtime work hours, and housework hours. The table also provided estimates of remote work from the estimated pooled OLS models, the estimated GMM random effect models, and the estimated MLE random effect models. *** implies an estimate is statistically significant at a 99% significant level; ** implies an estimate is statistically significant at a 95% significant level; * implies an estimate is statistically significant at a 90% significant level. Standard errors are provided in parentheses. Finally, the table provided information on which control variables we used for each model in columns 2 and 3 of the explanatory variables' column. The definitions of these control variables are shown in Table 1.

Table 4: Subsample analysis results by gender

Gender	Dependent variables	Remote work	Obs.	p-value	Chi2 statistics
Male	Total market hour	-3.852*** (0.777)	997	0	332.5
	Market work	-2.543** (1.079)	997	0	197.3
	Paid overtime	-0.0608 (0.472)	997	0	117.2
	Unpaid overtime	-1.456*** (0.401)	997	0	139.3
	Housework	0.720 (0.695)	997	0.000547	42.61
Female	Total market hour	-3.023** (1.304)	854	0	226
	Market work	-3.022** (1.289)	854	0	162.5
	Paid overtime	-0.0627 (0.282)	854	9.38e-11	83.43
	Unpaid overtime	0.721 (1.399)	854	0	91.98
	Housework	0.327 (0.503)	854	0	97.96

Note: This table provided the gender subsample analysis results of remote work on our interested dependent variables: total market work hours, market work hours, paid overtime work hours, unpaid overtime work hours, and housework hours. The table provided estimates of remote work from the estimated GMM random effect models with full control. *** implies an estimate is statistically significant at a 99% significant level; ** implies an estimate is statistically significant at a 95% significant level; * implies an estimate is statistically significant at a 90% significant level. Standard errors are provided in parentheses.