

Careers of Married Women and the Nature of Husbands' Work: Evidence from Japan¹

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Abstract

This paper provides fresh insight and evidence on the gender gap in promotion in the workplace. Our use of the Japanese data is motivated by Japan's unusually large gender gap in the labor market in spite of the rapidly narrowing gender gap in educational attainment, and the present policy priority on enhancing career development of Japanese women. The multinomial logit estimates as well as the cohort analysis using the Employment Status Survey (a large representative repeated cross-section data) show consistently that when her husband is not in the rat race promotion tournament, the married woman is less likely to stay home as a full-time homemaker and more likely to work. However, the married woman's increased labor market participation as a result of her husband's exit from his rat race takes the form of work with limited scope for career advancement (e.g., non-standard employment such as part-time, and fixed-term contract work). We find no evidence that the husband's exit from the rat race will result in an increase in her wife's odds of pursuing her own career advancement. In contrast, a fall in the payoff from her husband's winning the rat race (the size of the winning prize) will result in an increase in the wife's odds of pursuing her own career. To overcome the limitations of the cross-section analysis such as the selection issue caused by assortative mating, we further conduct an additional analysis of panel data (the Labor Force Survey). The panel data analysis confirms that the husband's exit from his rat race will lead to a decrease (rather than an increase) in her odds of pursuing her career job with promotion prospect and an increase in her odds of switching to non-career jobs. The finding is consistent with the theory of joint consumption of household public goods and synchronization of leisure-work choice between the husband and the wife. Our findings imply that without significant changes in the structure of Japan's well-established internal labor markets, simply making married men work fewer hours may not help Japanese policy makers achieve their current ambitious policy goal of "increasing the share of women in leadership positions to at least 30% by 2020 in all fields in society."

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1. Introduction

The objective of the paper is to provide fresh insight and evidence on the persistent gender gap in promotion in the workplace. Sheryl Sandberg, who runs Facebook, once famously said "The most important career choice you'll make is who you marry." We depart from the literature on gender gap in promotion by taking her words seriously and paying particular attention to possible interplay between the married woman's career choices and the nature of her husband's work (in particular whether he participates in the rat race promotion tournament with long working hours as a necessary condition for promotion).

The data we use are from Japan. The use of Japanese data is of particular interest. In Japan gender gaps in the labor market are unusually large, and narrowing such gaps is currently of top policy priority. According to the OECD, the gender gap in median earnings for full-time employees was approximately 29% in 2012, almost twice as high as the OECD average; Japanese women earn only two-thirds of what men earn. The persistent large gender pay gap in Japan is particularly troublesome for policy makers since gender gaps in educational attainment narrowed considerably in Japan. Only 12.3% of women advanced to university in 1980, while the rate increased to 47.0% in 2014 according to the School Basic Survey. As the proportion of college-educated women has increased, the worker composition of full-time workers has changed dramatically. In particular, there has been a significant increase in the proportion of female university graduates among full-time workers from 1.1% in 1981 to 8.0% in 2014 (BSWS). Further, the average tenure of full-time female workers is longer than it was in the 1980s. The average tenure of full-time female workers was 6.2 years in 1981 and increased to

9.3 years in 2014 (Basic Survey of Wage Structure, BSWS).³ Despite these improvements in average female education levels and tenure, however, significant gender wage gaps persist in Japan.

Studies have highlighted several reasons for the significant gender gap in the labor market in Japan. The major reason is that so few women are promoted to managerial positions. According to the BSWS, the proportion of female college graduates in managerial positions was only 1.4% in 1985 and 6.2% in 2010. Career interruption due to childbearing is the one of the reasons that so few women reach managerial positions.⁴ Kato et al. (2013) find that childbearing results in a considerable wage loss as well as a substantial reduction in the probability of being promoted in Japan. Japanese women are generally less attached to the labor market because the family's main breadwinner is typically a man, and there is a significant gender wage gap.

The demanding work environment in the workplaces means that a large proportion of female standard employees quit their jobs and gives up their promotion prospect after giving birth (since they have a high disutility of hours) which is a major policy issue in Japan. With the aim of achieving the target of “increasing the share of women in leadership positions to at least 30% by 2020 in all fields in society” (“the target of 30% by 2020”), numerical targets for women’s participation were set in the Third Basic Plan for Gender Equality for a wide range of fields, including politics, national and local civil services, private sector, education and research. (Japanese Government, Gender Equality Bureau Cabinet Office).

Table 1 shows the estimated coefficient on female dummy in a simple Mincerian wage

³ Corresponded change in male is from 39.3% to 55.9% from enrollment rates of universities, and from 11.0 years to 13.5 years for average tenure.

⁴ Asai, Kambayashi and Yamaguchi (forthcoming) for the employment effects of childcare availability in Japan. Asai (forthcoming) and Yamaguchi (2014) for the employment effects of parental leave legislation.

regression, using data from the BSWs. The gender wage gap for full-time workers is still 30.8% even after controlling for human capital attributes, and 11.7% among the university graduates. However, the gap shrinks to 9.4% once job levels (Rank) are controlled for. Figure 1 shows the similar pattern; the majority of gender gap in Japan can be explained by the fact that so few women are being promoted to managerial positions. While the raw gender gap looks diminishing, the ‘true’ gap within rank looks widening (time-series analysis from Figure 1). There are urgent needs in Japan for deeper understanding of the nature, scope and causes of gender gaps in promotion in the workplace.

After the literature review, we provide a theoretical exploration on the relationship between the married woman’s career choices and her husband’s participation in the rat race promotion tournament. We describe the rat race promotion tournament and discuss how the married woman chooses among the three career choices: (i) entering her own rat race promotion tournament; (ii) staying home as a full-time homemaker; and (iii) working as a non-contestant for the rat race. Most importantly we explain how such a career decision by the married woman can be affected by whether or not her husband is in the rat race. Guided by the theoretical exploration, we investigate the married woman’s career choices in relation to her husband’s rat race status, using two complementary data sources: (i) the Employment Status Survey (ESS) and (ii) the Labor Force Survey (LFS). The ESS is a large, highly representative survey, and provides reliable repeated cross-section data which enable us to conduct a cross-sectional multinomial logit analysis as well as an informative cohort analysis. To account for the limitations of such cross-sectional analysis, we also conduct a complementary panel data analysis, using the LFS (the monthly survey that the government uses to calculate Japan’s unemployment rates).

Overall, we find that when her husband is not in the rat race, the married woman is less likely to stay home as a full-time homemaker and more likely to work as a non-contestant worker. However, importantly we find no evidence that the husband's exit from the rat race will result in an increase in her wife's odds of pursuing career with promotion prospects. In contrast, a fall in the payoff from her husband's winning the rat race (the size of the winning prize) will result in an increase in the wife's odds of pursuing her own career.

In the next section we review the literature that is related to our study, and place our study in the literature. Section 3 begins with a brief theoretical discussion on the married woman's responses in terms of her career choices to her husband's exit from his promotion tournament, and presents the results from our analysis of the ESS. Our panel data analysis of the LFS is presented in section 4, followed by the concluding section.

2. Previous Studies

The gender gap in labor market outcomes is explained by differences in human capital accumulation and occupational differences⁵. A number of other explanations for the residual portion of gender difference in labor market outcomes have arisen in the past 10 years. Some studies focus on the impact of technological progress on women's labor market outcomes⁶. Other studies discuss the gender difference in terms of psychological attributes and preferences (e.g. risk preferences, social preferences, attitude toward competition) and their relations to labor market outcomes (see Croson and Gneezy, 2009; Bertrand, 2011 and references therein).

⁵ See, O'Neill and Polachek(1993), Brown and Corcoran(1997), Altonji and Blank(1999), Borjas (2012) , Blau(2012) , Boeri and van Ours (2013), Goldin (2014) and reference therein.

⁶ For example, Goldin and Katz (2002) show the diffusion of the birth control pill lower the costs of long-duration professional education form women and rise the age at first marriage. Greenwood et al (2005) shows that technological progress in the household sector played a major role in liberating women from the home. See also, Weinberg (2000).

If women are less likely to compete in the labor market, this not only reduces the number of women who compete for workplace promotions, but also the number that obtain a promotion. From a controlled experiment, Gneezy et al. (2003) find that women are less effective than men in competitive environments even though they are able to perform similarly in non-competitive environments. They also find that women's performance increases when they compete for workplace promotions only with other women. Niederle and Vesterlund (2007) find that the lack of women competing for workplace promotions is driven by men being more overconfident and by gender differences in preferences for performing in a competition⁷. The gender difference in overconfidence disappears in an affirmative action setting in which one woman is hired for every man (Niederle and Vesterlund, 2008).

Women are more risk-averse than men which may also explain gender differences in the workplace. Bonin et al. (2007) show that risk-averse individuals are more likely to work in occupations with low earnings risk. DeLeire and Lavy (2004) show that workers with childcare responsibilities have strong aversion to physical risk and thus work into safer jobs.

Women still take greater responsibility for childrearing and housework at the expense of labor market participation (Becker, 1985).⁸ Lazear and Ronsen (1990) argue that the higher expected value of home time induces a higher probability of job separation for women. They also argue that the ability standard for promotion is higher for women because of the female's lower propensity to remain on the job.⁹ Therefore, because time-intensive career investments are

⁷ Barber and Odean (2001) show that financial market men trade 45 percent more than women. Theoretical models predict that overconfident investors trade excessively.

⁸ Akerlof and Kranton (2000) use their gender identity model to explain that a husband loses identity when he does the housework and when his wife earns more than he does, but that his equality of utility is restored when his wife does relatively more housework.

⁹ An undersupply of paid childcare also increases the cost of market work (See Blau and Currie (2006) and reference therein). Studies have shown that improved access to public preschools (i.e. an

difficult for women with childcare and housework responsibilities, greater help from husbands might encourage women's careers by reducing their efforts in the household.

Recent studies build on gender gap in such time-intensive career investment, and pay particular attention to interplay between hours worked and gender gap in the labor market (Goldin and Katz (2008), Bertrand et al (2010), Gicheva (2013) and Goldin (2014)¹⁰). People who are willing to sacrifice their time to reap the reward and self-confident people are more likely to compete for workplace promotions than others. Further, firms tend to discourage competing for workplace promotions for workers who are risk-averse or unwilling to work long hours. Kuhn and Lozano (2008) examine long hour's premium in the US and find that increase in salary dispersion is associated with increases in propensity to work long hours¹¹. Landers et al. (1996) speculate that the rat-race equilibrium reduces access to promotions for those unwilling to work long hours (because of a responsibility for housework and/or childcare¹²) and that this fact might keep a number of qualified women out of leadership positions¹³. Goldin (2014) states that

implicit childcare subsidy) increases maternal employment (Berlinski and Galiani (2007), Gelbach(2002), Fitzpatrick (2010), Nollenberger and Rodriguez-Planas(forthcoming)). A reduction in the cost of childcare via childcare subsidies also increases mothers' employment (Sanchez-Mangas and Sanchez-Marcos (2008), Azmat and Gonzalez (2010)). Public policy which increases childcare subsidies, together with expanding access to public childcare, would thus increase maternal employment the most (Lefebvre and Merrigan, 2008). Providing access to childcare is especially important in countries where traditional family roles are prevalent and the maternal employment rate is low (Blau and Kahn (2007), Fitzpatrick (2010), Nollenberger and Rodriguez-Planas(forthcoming)). See Asai, Kambayashi and Yamaguchi (forthcoming) for childcare availability in Japan.

¹⁰ All of these studies focus on high-skilled labour force.

¹¹ Landers et al. (1996) empirically test his model and find that law firms use indicators of the propensity to work very hard in their promotion decisions which leads to workers working inefficiently long hours; hence, adverse selection in working hours arises. Rosenthal and Strange (2008) find that agglomeration is associated with fewer hours worked among non-professionals, whereas a working hours increase is related to the density of employment in the worker's occupation and location among professional workers.

¹² Workers with childcare responsibilities need to consider whether working more hours at the office is worth sacrificing time with their children (Ehrenburg and Smith, 2011).

¹³ Landers et al (1996) discuss that rat-race equilibrium can be expected in group that (1) group members benefit from the productive activity of each other, (2) the output of group is influenced by the

the gender gap in pay would be reduced and might even vanish if firms did not have an incentive to disproportionately reward individuals who worked long hours. Our study aims to test if their speculation is true and to examine women's rat-race participation and its relationship with the degree of support from husbands. The present study contributes to the literature by investigating under which circumstances women compete for workplace promotions given the prevalence of long working hours in Japan.

3. The Married woman's career choice and the husband's rat race participation

Consider simple rat race promotion tournament in which the contestant worker signals his/her suitability for promotion to management (which is the worker's private information) to the employer by working very long hours, and in equilibrium working long hours becomes a necessary condition for promotion (for a formal model of such tournament, see, for instance, Landers et al (1996) , Rosenthal and Strange (2008), Kato, et al., 2014).¹⁴ The objective of the paper is to explore potentially important linkage between the prevalence of such rat race promotion tournament and the limited career development of married women. Specifically we study interplay between careers of married women and their husbands' participation in rat race promotion tournament (hitherto simply called the rat race for the expositional brevity). On the one hand, having a husband in the rat race means that he is less available for household production and thereby the married woman ends up staying home and specializing on household production. It follows that career advancement of the married woman through her own participation in the rat race is hampered by her husband's participation in his own rat race,

work effort of members, (3) members have the ability to establish work norms. We believe that these criteria can be applied to majority of workplaces in Japan.

¹⁴ They assume working hours as the measure of work effort—An increase in work effort increases the promotion probability.

resulting in a negative association between the married woman's career advancement and her husband's rat race participation.

On the other hand, the literature on joint consumption of household public good points to the opposite positive association between the married woman's career development and her husband's rat race participation. For instance, Mansour and McKinnish (2014) find that couples that engage in less specialization spend more time together. Hamermesh (2002) investigates the extent of work time synchronization (jointness in the timing of potential leisure) among couples, and finds that most couples are working at roughly the same time, and thus they are likely to be away from work at the same time and are consuming leisure jointly. Hallberg (2003) finds that spouses coordinate their working schedule to obtain more synchronous leisure. Lastly, Lundberg (2012) finds that the source of marital surplus shifted from the specialized domestic production to joint consumption in Germany. In essence, this literature suggests that when the husband is no longer in the rat race and stops working long hours, his wife will be less likely to be in her own rat race, working long hours so that they can consume household public goods, in particular engage in joint consumption of leisure.

It is important to recognize that any cross-sectional analysis such as our analysis of the ESS is subject to the selection issue of assortative mating that points to a positive association between career development of the married women and her husband's participation in the rat race. Women with ambitious career aspirations are more likely to meet like-minded men with ambitious career aspirations in the marriage market (see, for instance, Lam, 1988, Fernandez, Guner, and Knowles, 2005, Bredemeier and Juessen, 2013, and Mare, 1991).

In addition to the two options we have discussed—(i) specializing in household production as a full-time homemaker and (ii) advancing career through participation in her own

rat race, the married woman has the third option—working but not participating in the rat race. In the Japanese context, such an option often takes the form of non-standard employment (e.g., part-time, temporary, subcontract). As shown in Kambayashi and Kato (2013), non-standard employment is significantly less stable, lower paid, and provides more limited opportunities for training and career advancement than standard employment. It is quite plausible that the married woman is more likely to switch from the full-time homemaker status to this third option—working but not advancing her career when her husband is no longer in the rat race.

Consider a newly married couple who takes a traditional specialization strategy—the husband works as a full-time standard employee and participates in the rat race, while the wife stays home as a full-time homemaker. Suppose after ten years of marriage, the husband is informed by his boss that he is no longer in the contestant pool for rat race promotion tournament. Since it is no longer necessary for the husband to continue to signal his suitability for promotion to management by working long hours, the husband is now more available for household production. Since rat race promotion tournament is often an elimination tournament, the husband cannot and will not reenter the rat race. As such, it appears to make sense that the wife now enters her own rat race and pursues the prize of promotion. However, the probability of winning rat race tournament is significantly lower for women than for men in part due to statistical discrimination (see, Kato, et al., 2014). The expected payoff from winning the tournament may be sufficiently low for the wife that she opts not to enter her own rat race. Instead she may take advantage of the increased availability of her time for paid work, and switch from a full-time homemaker to a wage earner yet not a contestant for rat race promotion tournament.

In sum, we expect that if her husband is not in the rat race, the married woman is less likely to stay home as a full-time homemaker, and instead more likely to work as a non-

contestant. It is, however, ambiguous if the married woman with her husband out of contention for promotion is more or less likely to work and contend for her own promotion (or in her own rate race) because of the offsetting assortative mating effect and/or the joint household goods consumption effect.

3.1 Multinomial Logit Analysis

The data in this study come from the Employment Status Survey (ESS), which was conducted by the Statistics Bureau on household members 15 years of age or older in approximately 440,000 households from 1982, to 2007, once every five year.¹⁵ This is a CPS-type household survey which contains 1% of the population in Japan.

The sample universe of this study is married women age 22-54 and worked as standard employees for at least one year in the past. We focus on this particular group of women, for contending for promotion by participating in the rat race is not a feasible option for most women who have never worked as standard employees. Married women with only high-school education who work as standard employees are also included in our sample universe. Yet we also repeat the same analysis excluding such women and focus only on college-educated married women. Reassuringly the results change little.

It is challenging to identify with precision whether or not the worker is presently in the rat race. Unlike CPS and other labor force surveys around the world, the ESS asks each worker how many hours he/she *usually* works per week as opposed to how many hours he/she actually

¹⁵ The survey is conducted on October 1st of each year and age is counted in full years as of September 30. Agricultural, forestry and fishery industries are excluded from the analysis. Firm size less than 5 is included in the firm size 5-9.

worked in the last week.¹⁶ Most workers may work long hours occasionally as a result of temporarily heavy work load. Yet participation in the rat race means sustaining long working hours as a norm. To this end, the ESS is probably the most suitable data to use in defining the rat race contestants. We consider two alternative definitions: (i) any standard employees who usually work 49 or more hours per week (broad definition); and (ii) any standard employees who usually work 60 or more hours per week (narrow definition). Figure 2 shows the percentage of standard employees who usually work 49 or more hours a week (60 or more hours a week) over the last three decades for men and women. The incidence of long hours fell during the first half of Japan's lost decade (1992-1997) and rose significantly since the end of the Lost Decade in 2002.¹⁷ Note that the standard-employment-to-population rate was stable over the last three decades.¹⁸

Our key empirical strategy is to apply a multinomial logit model to a representative sample of married women in Japan who have potentially three career choices: RATRACE (work as a standard employee in contention for promotion), NONCONTESTANT (work yet not in contention for promotion), and HOMEMAKER (stay home as a full-time homemaker). The key independent variable is HRATOUT which takes a value of 1 if her husband is not in the rat race, 0 otherwise. We control for her age and education, whether or not she has a child ages 0-14, in which prefecture she lives, and the size and industry classification of her firm. For the remainder of the paper, we present the results based on the broad definition of the rat race contestants (working 49 or more hours per week), although the results based on the narrow definition

¹⁶ The ESS asks "What category best describes your usual weekly hours?". There are up to 12 categories each year.

¹⁷ The incidence of long hours is approximately 20 percentage points higher than the US.

¹⁸ We estimated the wage premium associated with long working hours, using a similar methodology to Kuhn and Lozano, 2008 and Gicheva, 2013). Compared to those in the US, the long hour premium in Japan is found to be considerably small.

(working 60 or more hours per week) are comparable and available from the corresponding author upon request. Table 2 presents summary statistics, and the estimated marginal effects on each career choice of the married woman of her husband rat race status (HRATOUT) are shown in Table 3.¹⁹

The estimated marginal effects on the married woman's odds of choosing the homemaker option (HOMEMAKER) of HRATOUT are negative and statistically significant at the 1 percent level. As we expected, the married woman is found to be significantly less likely to stay home as a full-time homemaker when her husband is not in the rat race. The estimated marginal effects on the married woman's odds of working as a non-contestant (NONCONTESTANT) are also found to be positive and statistically significant at the 1 percent level, which is consistent with our prior expectation--the married woman will be more apt to work (but not contend for promotion) if her husband is not in the rat race.

The estimated marginal effects on the probability of the married woman's choosing to work AND contend for promotion are negative and statistically significant at the 1 percent level. The married woman with her husband not in contention for promotion is found to be less likely to pursue her own promotion by participating in the rat race, seemingly pointing to the strong presence of the joint household public goods consumption effect. As we discussed, however, there may be a strong assortative mating effect here--ambitious and career-oriented women are more likely to meet and marry similarly ambitious and career-oriented men, and vice versa. Since the ESS is cross-sectional, it is difficult to tease out the joint household consumption effect. We will address this issue in section 4 in which we use Japan's Labor Force Survey (LFS)

¹⁹ We will report marginal effects from the multinomial logit model instead of the odds ratio. Marginal effects are calculated from margins command in Stata.

which allows us to trace the same couple over time and hence study how the married couple changes their household production and consumption behavior over time.

Before leaving our cross-sectional analysis and turning to our longitudinal analysis, there is one alternative reason for the absence of the wife's entering her own rat race when her husband is not in the rat race. Our definition of entering the rat race promotion tournament is usually working 49 or more hours a week, and it is assumed to be the same for both men and women. It may well be the case that entering such rat race is not a feasible option for many married women even if their husbands are no longer in the rat race. To rule out this possibility, we repeat the same analysis by using a more feasible option of usually working 43 hours or more per week. In other words, the married woman now faces three options: (i) homemaker; (ii) career job (may not be in the rat race in the strict sense but planning to pursue career by usually working at least 43 hours; and (iii) non-career job (all other working options, typically contingent works). The results as shown in Table 4 are remarkable similar to those in Table 3, confirming the robustness of our results to the use of an alternative and more feasible career option for married women.

3.2 The Size of prize

We have focused on the married woman's response to her husband's work status (specifically whether or not he is in the rat race). In this section, we focus on the size of the winning prize for the husband's promotion tournament. Conditional on having a husband in the rat race, will the wife change her career choices, depending on the size of his winning prize? As the size of the husband's winning prize falls, the wife may be less willing to accept the specialization strategy (staying home as a full-time homemaker and support her husband's rat

race), for the expected payoff from taking such a strategy diminishes. Instead she may decide to enter her own rat race promotion tournament and pursue her own promotion prize. Alternatively she may decide to switch from a full-time homemaker to a non-contestant worker, and at least earn her own income, and become less dependent on the husband's shrinking prize which may become an important source for their old age income.

Data on the prize of winning rat race promotion tournament are not available from the ESS. To this end, we link our ESS data to the Basic Survey of Wage Structure (BSWS) in 1992, 1997, 2002, and 2007. The BSWS allows us to calculate the prize of winning tournament for 72 different sectors (nine industry classifications*eight firm size categories) for each year. Note that we define winning tournament as promotion to Kacho and Bucho (section chief and department head) which is found to be accompanied by over 30 percent increase in wage. Such calculated winning prize size for each year are then linked to the ESS data, using the same 72 industry*firm size combinations.

We modify the baseline multinomial logit model by limiting our sample to only those women whose husbands are in the rat race, and use the husband's winning prize size as the key explanatory variable instead of HRATOUT (whether or not the husband is in the rat race). The results are shown in Tables 5. The estimated marginal effects on RATRACE of the husband's winning prize size are negative and statistically significant at the 1 percent level, while the estimated marginal effects on HOMEMAKER are positive and statistically significant at the 1 percent level. The married woman is less likely to pursue her own promotion by entering the rat race when her rat racing husband's winning prize is greater. Instead she is more likely to stay home as a homemaker and support her rat racing husband.

The results on NON-CONTESTANT are slightly mixed. For 1992, 1997, and 2002, the married woman's response to the rising size of her husband's winning prize included a significant switch to non-contestant work. However, for the most recent year, 2007, the sign of the marginal effect was reversed, suggesting the reverse direction of the adjustment. We are not entirely sure why this reversal occurred in 2007. We speculate that this may have something to do with the rising proportion of non-standard female workers over the last two decades in Japan and their deteriorating working conditions in terms of job stability, wages, and other HRM policies (see, for instance, Kambayashi and Kato, 2013). In recent years the married women may be finding a full-time homemaker option more appealing in a face of the increased size of their husband's winning prizes.

3.3 Cohort Analysis

As we discussed before, the husband's rat race status may not be a static one. It is quite plausible that a young couple begins with a traditional role type—the husband in the rat race and the wife staying home as a full-time homemaker. However, as the couple ages, the husband will see the writing on the wall and exit from his rat race, and the wife may well change her full-time homemaker status accordingly. A rigorous study of such dynamic nature of interplay between the wife's career and her husband's rat race status will require panel data. Fortunately we have recently acquired access to such data (LFS) and we will present the results from our analysis of this panel dataset in the next section. However, before proceeding to our panel data analysis in the next section, its repeated cross-section feature notwithstanding, the ESS can allow for a synthetic cohort analysis which is a valuable complement to our panel data analysis, for the ESS

is much larger and more representative of the population than the LFS, and its data on working hours are particularly suitable for our analysis as discussed earlier.

We begin by classifying all married couples into the following six types: (i) Ratrace*Ratrace (both husband and wife in the rat race); (ii) Ratrace*Homemaker (husband in the rat race and wife at home); (iii) Ratrace*Non-contestant (husband in the rat race and wife working as a non-contestant); (iv) Non-contestant*Ratrace (husband working as a non-contestant and wife in the rat race); (v) Non-contestant*Homemaker (husband working as a non-contestant and wife at home); and (vi) Non-contestant*Non-contestant (both husband and wife working as non-contestants). Theoretically it is possible to have Homemaker*Ratrace, Homemaker*Homemaker, and Homemaker*Non-contestant. However, such combinations are rare in Japan and considering them does not affect the results.

Figures 3A and 3B show how the proportion of each of the six types of married couples for the cohort of age 25-29 (wife's age) in 1982, 87, 92, and 97 changes as the cohort gets older. Note that the ESS is not panel data but repeated cross-section data, and therefore that the validity of our cohort analysis depends on the representativeness of the cohort over time. In other words, we create synthetic cohort data by linking a sample of married women age 25-29 in 1982 to a sample of married women age 30-34 in 1987, and so forth. We are reasonably confident on the validity of such synthetic data for two reasons. First, as explained above, the ESS is one of the largest and most representative survey data of this kind (for instance, Japan's ESS is nearly ten times as large as U.S. CPS). Second, marriage turnover has been relatively low in Japan till recently, and most of those aged 25-29 who were married in 1982 remained married in later years. It is, however, possible that a sample of married women age 30-34 in 1987 include those who got married between 1982 and 1987. To assess the seriousness of this problem, we repeat

the same analysis for two additional older cohorts, the 30-34 age cohort and the 35-39 age cohort that are relatively free from the aforementioned issue simply because of the rarer incidence of marriages at old age in Japan.

In 1982 one in four young couples (wife's age 25-29) had the traditional role type of Ratrace*Homemaker (the husband works long hours to stay in his rat race promotion tournament and his wife stays home as a full-time homemaker and specializes on household production). They experience little change in the next five years. As they age further, however, the picture changes a bit. The proportion of the traditional role type falls precipitously for the following ten years—from 25 percent in their late 20s to 15 percent in their late 30s to 10 percent in their early 40s. We speculate that the precipitous decline in the proportion of the traditional role type over the life cycle of the Japanese couples is in part due to the prolonged nature of the Japanese promotion tournament—many standard employees remain in the promotion tournament for a considerable length of time (five or more years) before they start seeing the writing on the wall (see, for instance, Koike 2005).

The rapid fall in the proportion of the traditional role type of couples which begins in their late 30s is not accompanied by any discernible increase in the reversed role type of Non-contestant*Ratrace (wife in the rat race, pursuing promotion while husband not in the rat race). The proportion of the reversed role type remains less than 3 percent (and then a modest increase in their late 40s and early 50s). The most notable rise which parallels the precipitous decline in the proportion of the traditional type is found for Non-contestant*Non-contestant (both husband and wife working as non-contestants). Thus, the non-contestant couples as a percentage of all couples remain at around 25 percent in their late 20s and early 30s. However, as they enter their late 30s, the proportion of the non-contestant couples rises rapidly and continues till their early

40s, and then tapers off. The time profile of the proportion of the non-contestant couples is almost an exact mirror image of that of the proportion of the traditional role type couples, suggesting strongly that when the husband starts seeing the writing on the wall and thereby exiting from his rat race promotion tournament, his wife will switch from a full-time homemaker to a non-contestant worker.

To detect any generational changes over time, we repeat the same cohort analysis for the subsequent 25-29 age cohorts (the 25-29 age cohort in 1987, 92, and 97).²⁰ In 1987 (the peak of the Japanese financial bubble), the overall picture is quite similar to that in 1982. In spite that the 25-29 age cohort in 1992 and 1997 had to live through Japan's Lost Decade, overall the time profiles of the proportion of the six types of couples differ little from those of the earlier generations (for further evidence on the continuity of the Japanese employment system during Japan's Lost Decade, see Kambayashi and Kato, 2011, 2012).

Figures 4A, 4B, 5A and 5B are drawn for two additional older cohorts for each year—the 30-34 age cohort and the 35-39 age cohort in 1982, 87, 92, and 97). Reassuringly the results for the older cohorts that are relatively void of the marriage turnover issue are essentially the same as the 25-29 age cohort.

4. Panel data analysis

Japan's Labor Force Survey(LFS) was conducted by the Statistics Bureau of the Ministry of Internal Affairs and Communications, and it includes approximately 100 thousand household members who are 15 years of age or older. The survey is conducted as of the last day of each month. Most importantly the survey has a rotating panel structure—the survey gathers data from

²⁰ The full time profiles for the later generations are not available due to the lack of data on them for later years.

the same individual four times: for two consecutive months of the year and for the same consecutive two months a year later. For instance, if an individual is surveyed at the end of March of 2000 for the first time, she will be surveyed again at the end of April of 2000, and then at the end of March and April of 2001. For every individual, we have four data points, t , $t-1$, $t-2$, and $t-3$. In the above example, t =April of 2001, $t-1$ =March of 2001, $t-2$ =April of 2000, and $t-3$ =March of 2000. An important drawback of the LFS as compared to the ESS is that data on hours worked are not usual working hours but actual working hours for the last week.²¹ As such, hours data from the LFS are more susceptible to temporary shocks. Even if not in the rat race and thereby not working long hours usually, he/she may well be reporting to work long hours for any particular week due to some temporary shocks to the workplace (unexpected jump in demand for their product or unexpected absence of their colleagues).

To address this measurement issue, we define being in the rat race as working over 50 hours per week as a standard employee for two consecutive periods. We focus on all married women age 22-54 and their husbands. We were granted access to micro data for 2008-2012.

Essentially we repeat the same multinomial logit analysis as before yet instead of estimating cross-sectional association between the husband's rat race participation and the wife's career choice, we estimate the dynamic response of the wife to her husband's rat race status changes. Specifically we use data on $t-3$ and $t-2$, and group all married couples into the following three categories: (i) modern marriage with both the husband and the wife being in the rat race; (ii) traditional marriage with the husband being in the rat race and the wife staying home as a homemaker and (iii) hybrid marriage with the husband in the rat race and the wife working as a non-contestant for the promotion tournament. For each of those three marriage type groups, we

²¹The LFS records hours as numeric values.

estimate the odds of the wife's career choices as a function of her husband's exit from his rat race. The husband's exit from his rat race is defined as $H_{ratout_{it}}=1$ if in period t , wife i has a husband who dropped out of his rat race promotion tournament in period $t-1$, 0 otherwise.

Having a husband who dropped out of the rat race in period $t-1$ is defined as having a husband who worked 50 or more hours a week in period $t-3$ and period $t-2$, and then worked less than 50 hours in period $t-1$ and period t (formally, $R_{at_{it-3}}=1$, $R_{at_{it-2}}=1$, $R_{at_{it-1}}=0$, and $R_{at_{it}}=0$ where $R_{at_{it}} = 1$ if wife i has a husband who works 50 or more hours a week in period t , 0 otherwise).

Modern marriage couples: the married woman i in modern marriage will face three career choice outcomes in period t when her husband exits from his rat race in period $t-1$: (i) changing her status from rat-racing standard employee to homemaker, $RH_{it} = 1$; (ii) changing her status from rat-racing standard employee to non-contestant worker, $RN_{it} = 1$; and (iii) continuing her rat racing, $RR_{it} = 1$. We estimate the odds of each outcome as a function of $H_{ratout_{it}}$. When the husband exits from his rat race tournament, as shown in Table 6, the odds of continuing her rat race will fall significantly, while the odds of switching to non-contestant employment will rise significantly. The odds of switching to homemaker status are mostly unaffected. That the husband's exit from his rat race leads to his wife's career switch from rat-racing standard employment to non-contestant employment is consistent with the earlier result from our cross-sectional analysis the ESS data. Since the panel analysis is less subject to the selection issue of assortative mating, our panel analysis confirming the earlier cross-section result can be interpreted as favoring the joint household public good consumption effect over the assortative mating effect. When the husband exits from his rat race, the wife will also exit from her rat race so that they can consume the household public goods jointly (joint vacation) by synchronizing

their work schedules which would be difficult if the wife continues to work over 50 hours a week.

There is, however, an alternative explanation for the result. The married couple might have been hit by a major common shock to the household which necessitated both to exit from their respective rat races. Our data allow us to consider one such common shock, changes in the number of children. The last column of the table shows the results when we add changes in the number of children as an additional control. Even if we account for such an important common shock to the household, we still obtain the same result—the husband’s exit from his rat race results in the wife’s switch from rat racing standard employment to non-contestant employment. It is unlikely that household common shocks are driving the result.

Traditional marriage couples: the married woman i in traditional marriage will face three career choice outcomes in period t when her husband exits from his rat race in period $t-1$: (i) continuing her full time homemaker status, $HH_{it} = 1$; (ii) changing her status from homemaker to rat racing worker, $HR_{it} = 1$; and (iii) changing her status from homemaker to non-rat racing worker, $HN_{it} = 1$. We estimate the odds of each outcome as a function of $Hratout_{it}$. When the husband exits from his rat race tournament, his wife is more likely to switch her status from homemaker to non-contestant worker, while she is less likely to switch her status from homemaker to rat-racing career woman (Table 7). As in the case of modern marriage, the result changes little even when we account for changes in the number of children (common household shocks). Finally, we also consider possible heterogeneity of adjustment cost associated with a switch from homemaker status to employment by considering the previous employment experience of the homemaker wife as an additional variable. The result turns out to change little.

The husband's exit from his rat race is found to result in his wife's leaving her homemaker status and entering the labor market as a non-contestant worker (such as part-time, fixed contract, and subcontract jobs). The finding is consistent with the income effect. The husband's exit from his rat race means a drop in the husband's future earnings stream, prompting his wife to enter the labor market and make up for the expected drop in the household income stream in the future.

Hybrid marriage couples: the married woman i in hybrid marriage will face three career choice outcomes in period t when her husband exits from his rat race in period $t-1$: (i) changing her status from non-contestant employment to homemaker, $NH_{it} = 1$; (ii) continuing her non-contestant employment status, $NN_{it} = 1$; and (iii) switching her status from non-contestant employment to rat racing standard employment, $NR_{it} = 1$. When the husband exits from his rat race tournament, as shown in Table 8, the odds of continuing her non-contestant employment status will rise significantly, while the odds of switching to rat-racing standard employment status will fall significantly. The odds of switching to homemaker status are largely unaffected.

5. Conclusions

This paper has provided fresh insight and evidence on the gender gap in promotion in the workplace. Our use of the Japanese data is motivated by Japan's unusually large gender gap in the labor market in spite of the rapidly narrowing gender gap in educational attainment, and the present policy priority on enhancing career development of Japanese women. The multinomial logit estimates as well as the cohort analysis using the Employment Status Survey (a large representative repeated cross-section data) has shown consistently that when her husband is not in the rat race promotion tournament, the married woman is less likely to stay home as a full-

time homemaker and more likely to work. However, the married woman's increased labor market participation as a result of her husband's exit from his rat race has been found to take the form of work with limited scope for career advancement (e.g., non-standard employment such as part-time, and fixed-term contract work). We have found no evidence that the husband's exit from the rat race will result in an increase in her wife's odds of pursuing her own career advancement. In contrast, a fall in the payoff from her husband's winning the rat race (the size of the winning prize) has been found to be positively associated with an increase in the wife's odds of pursuing her own career.

To overcome the limitations of the cross-section analysis such as the selection issue caused by assortative mating, we have further conducted an additional analysis of panel data (the Labor Force Survey). The panel data analysis has confirmed that the husband's exit from his rat race will lead to a decrease (rather than an increase) in her odds of pursuing her career job with promotion prospects and an increase in her odds of switching to non-career jobs. The finding is consistent with the theory of joint consumption of household public goods and synchronization of leisure-work choice between the husband and the wife.

An important policy implication is that simply encouraging Japanese husbands to stop working long hours may not result in career advancement of Japanese women. Instead any policy effort to discourage Japanese husbands to work long hours will result in a further growth of nonstandard employment for married women with limited scope for career advancement. Without significant changes in the structure of Japan's well-established internal labor markets, simply making married men work fewer hours may not help Japanese policy makers achieve their current ambitious policy goal of "increasing the share of women in leadership positions to at least 30% by 2020 in all fields in society."

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Table 1: Estimated coefficient on female dummy

Sample	Whole sample	Whole sample	Fulltime	Fulltime * University	Fulltime * University
Female	-0.585 (0.00)	-0.389 (0.00)	-0.308 (0.00)	-0.117 (0.00)	-0.094 (0.00)
Year dummies	YES	YES	YES	YES	YES
Age, tenure	NO	YES	YES	YES	YES
Rank	NO	NO	NO	NO	YES

Source: Basic Survey on Wage Structure, 1993-2010

Note: Bonus is included.

Table2: Summary statistics

	1992	1997	2002	2007
age 22-24	2.7%	2.4%	1.4%	0.9%
age 25-29	13.0%	12.8%	10.6%	7.1%
age 30-34	18.8%	17.9%	17.9%	17.0%
age 35-39	19.6%	18.8%	18.4%	19.8%
age 40-44	21.4%	18.3%	17.9%	19.1%
age 45-49	14.5%	18.8%	17.2%	19.3%
age 50-54	10.0%	11.0%	16.5%	16.9%
Nuclear family	67.3%	71.3%	69.7%	72.0%
Three-generation family	32.2%	28.4%	30.1%	27.8%
Other family type	0.5%	0.3%	0.2%	0.2%
RATRACE	7.4%	5.1%	7.9%	9.8%
NONCONTESTANT	56.5%	58.0%	57.1%	59.9%
HOMEMAKER	36.1%	37.0%	34.9%	30.3%
Middle-school	13.4%	9.0%	5.5%	2.2%
High-school	59.0%	57.4%	52.3%	42.7%
Some college	19.7%	24.2%	30.4%	38.9%
University graduates	7.5%	8.9%	11.5%	15.2%
Husband: RATRACE	36.5%	32.2%	38.4%	41.1%
Husband: NONCONTESTANT	62.2%	66.2%	58.8%	57.1%
Husband: HOMEMAKER	1.3%	1.6%	2.9%	1.8%
Sample size	108016	105222	74726	63393

Source: the Employment Status Survey, 1992-2007

Table 3: Marginal effects of husband's rat race exit (HRATOUT) on wife's career choice

	Ratrace	Non-contestant	Homemaker	N
1992	-0.132*** (0.002)	0.139*** (0.003)	-0.007*** (0.001)	70767
1997	-0.099*** (0.002)	0.109*** (0.002)	-0.009*** (0.001)	67662
2002	-0.123*** (0.003)	0.130*** (0.003)	-0.007*** (0.001)	49199
2007	-0.099*** (0.003)	0.127*** (0.003)	-0.028*** (0.002)	48096

Source: the Employment Status Survey, 1992-2007

Note: The dependent variable is women's career choice (RATRACE, NONCONTESTANT or HOMEMAKER). Marginal effects from the multinomial logit model are of the husband's career choice takes 1 if the husband is out of the rat race.

$$dP(\cdot)/dx(\sum dP(\cdot)/dx)$$

Table 4: Marginal effects of husband's rat race exit (HRATOUT) on wife's career choice: Using an alternative threshold weekly hours of 43.

	Career	Non-career	Homemaker	N
1992	-0.105*** (0.004)	0.112*** (0.004)	-0.007*** (0.001)	70767
1997	-0.108*** (0.004)	0.118*** (0.004)	-0.009*** (0.001)	67662
2002	-0.125*** (0.004)	0.132*** (0.004)	-0.007*** (0.001)	49199
2007	-0.090*** (0.004)	0.117*** (0.004)	-0.028*** (0.002)	48096

Source: the Employment Status Survey, 1992-2007

Note: The dependent variable is women's career choice (CAREER, NON-CAREER or HOMEMAKER). Marginal effects from the multinomial logit model are of the husband's career choice takes 1 if the husband is out of the rat race.

$$dP(\cdot)/dx(\sum dP(\cdot)/dx$$

Table 5: Marginal Effect of husband's winning prize on wife's career choice

	Ratrace	Non- contestant	Homemaker	N
1992	-0.100*** (0.008)	0.069*** (0.008)	0.031*** (0.003)	24145
1997	-0.094*** (0.007)	0.058*** (0.008)	0.036*** (0.003)	19615
2002	-0.078*** (0.008)	0.048*** (0.009)	0.030*** (0.003)	17252
2007	-0.065*** (0.011)	-0.152*** (0.013)	0.217*** (0.009)	18869

Source: the Employment Status Survey, 1992-2007

Note: The dependent variable is women's career choice (RATRACE, NONCONTESTANT or HOMEMAKER). We limit our sample to only those women whose husbands are in the rat race.

Table 6 Marginal effects of husband's rat race exit (HRATOUT) on wife's career choice: Modern marriage couples

	Base (no covariates)			Covariates			Covariates + child change		
	RH	RN	RR	RH	RN	RR	RH	RN	RR
Husband's Ratout (Hratout)	0.020 (0.017)	0.369*** (0.038)	-0.388*** (0.040)	0.028 (0.018)	0.347*** (0.038)	-0.375*** (0.041)	0.023 (0.018)	0.348*** (0.038)	-0.371*** (0.040)
N	1016	1016	1016	980	980	980	980	980	980

Source: the Labor Force Survey , 2008-2012

* p<0.10, ** p<0.05, *** p<0.010

Covariates= Age at t-2, husband's age at t-2, Number of kids (under 19) dummies at t-2 (0, 1, 2, 3 or more)

Education Level, Industry dummies, Prefecture FE, Calendar Year FE in t-2

Marginal effects from multinomial logit model are reported. Standard Errors are in parenthesis.

Table 7 Marginal effects of husband's rat race exit (HRATOUT) on wife's career choice: Traditional marriage couples

	Base (no covariates)			Covariates			Covariates + child change		
	HH	HN	HR	HH	HN	HR	HH	HN	HR
Husband's Ratout (Hratout)	0.002 (0.011)	0.030*** (0.009)	-0.032*** (0.008)	0.004 (0.011)	0.028*** (0.009)	-0.032*** (0.008)	0.003 (0.011)	0.029*** (0.009)	-0.032*** (0.008)
N	11573	11573	11573	11465	11465	11465	11465	11465	11465

Source: the Labor Force Survey , 2008-2012

* p<0.10, ** p<0.05, *** p<0.010

Covariates= Age at t-2, husband's age at t-2, Number of kids (under 19) dummies at t-2 (0, 1, 2, 3 or more)

Education Level, Industry dummies, Prefecture FE, Calendar Year FE in t-2

Marginal effects from multinomial logit model are reported. Standard Errors are in parenthesis.

Table 8 Marginal effects of husband's rat race exit (HRATOUT) on wife's career choice: Hybrid marriage couples

	Base (no covariates)			Covariates			Covariates + child change		
	NH	NN	NR	NH	NN	NR	NH	NN	NR
Husband's Ratout (Hratout)	0.005 (0.006)	0.022*** (0.008)	-0.027*** (0.005)	0.007 (0.006)	0.021*** (0.008)	-0.028*** (0.005)	0.008 (0.006)	0.020** (0.008)	-0.028*** (0.005)
N	13853	13853	13853	13374	13374	13374	13374	13374	13374

Source: the Labor Force Survey , 2008-2012

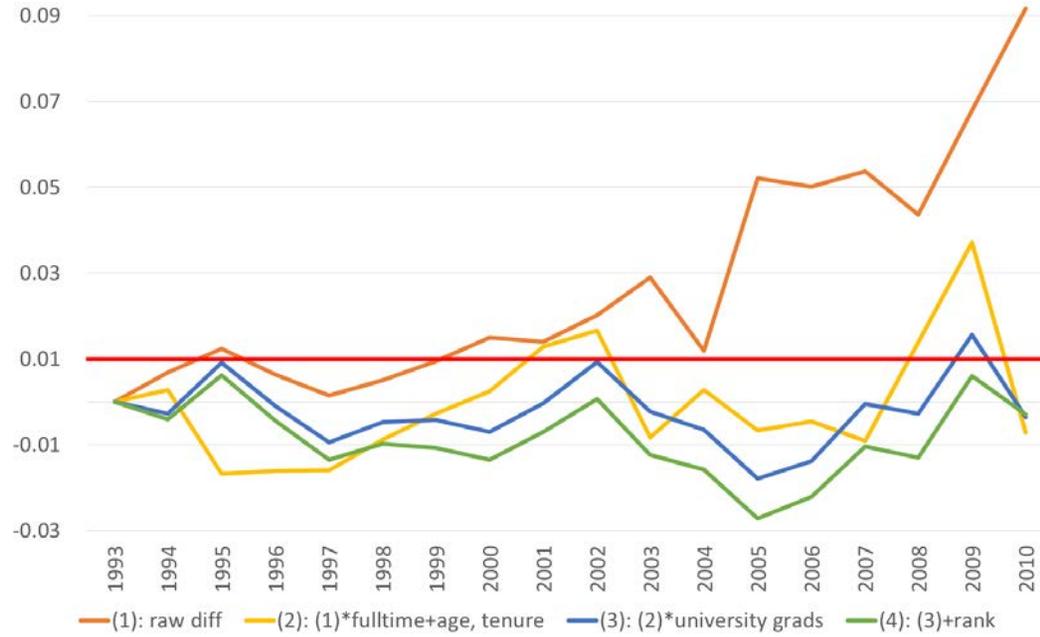
* p<0.10, ** p<0.05, *** p<0.010

Covariates= Age at t-2, husband's age at t-2, Number of kids (under 19) dummies at t-2 (0, 1, 2, 3 or more)

Education Level, Industry dummies, Prefecture FE, Calendar Year FE in t-2

Marginal effects from multinomial logit model are reported. Standard Errors are in parenthesis.

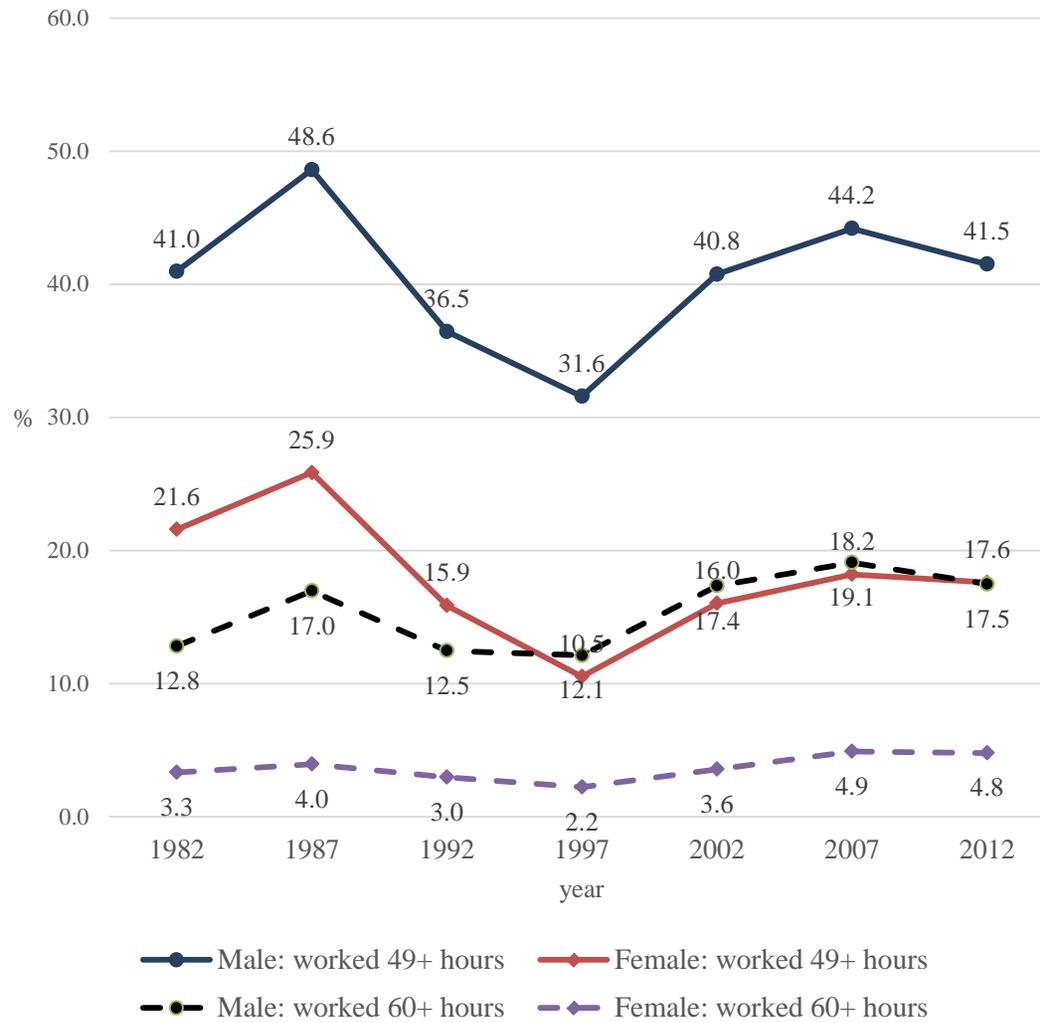
Figure 1: Gender wage gap in Japan over 1993-2010



Data Source: Basic Survey on Wage Structure, 1993-2010

Note: the estimated coefficient on female dummy*year dummies in wage regression (the 1993 coefficient set to zero)

Figure 2: Percentage of standard employees who usually work long hours



Data Source: the Employment Status Survey from 1982 to 2012

Figure 3A Career Choices of Married Women and Husbands' Participation in the Rat Race: Analysis of Cohort 25-29

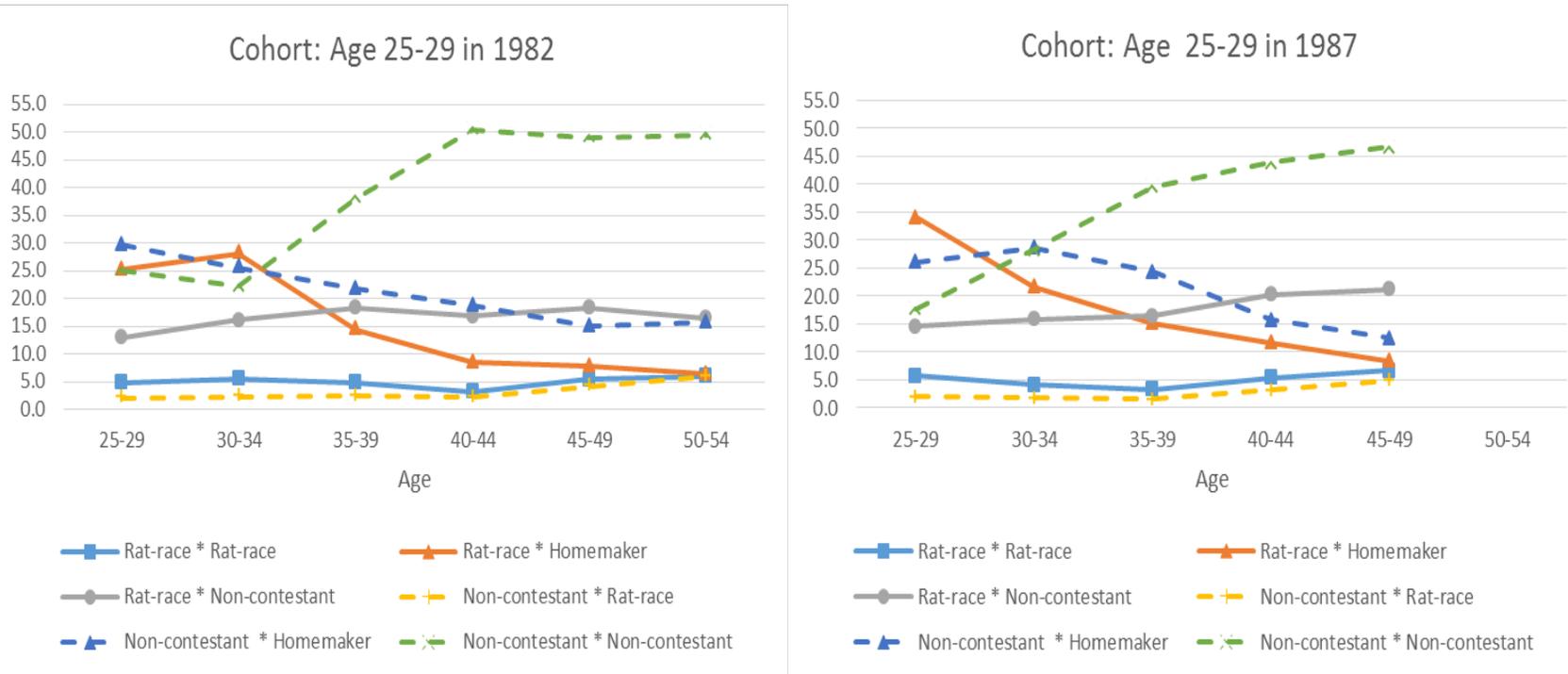


Figure 3B Career Choices of Married Women and Husbands' Participation in the Rat Race: Analysis of Cohort 25-29

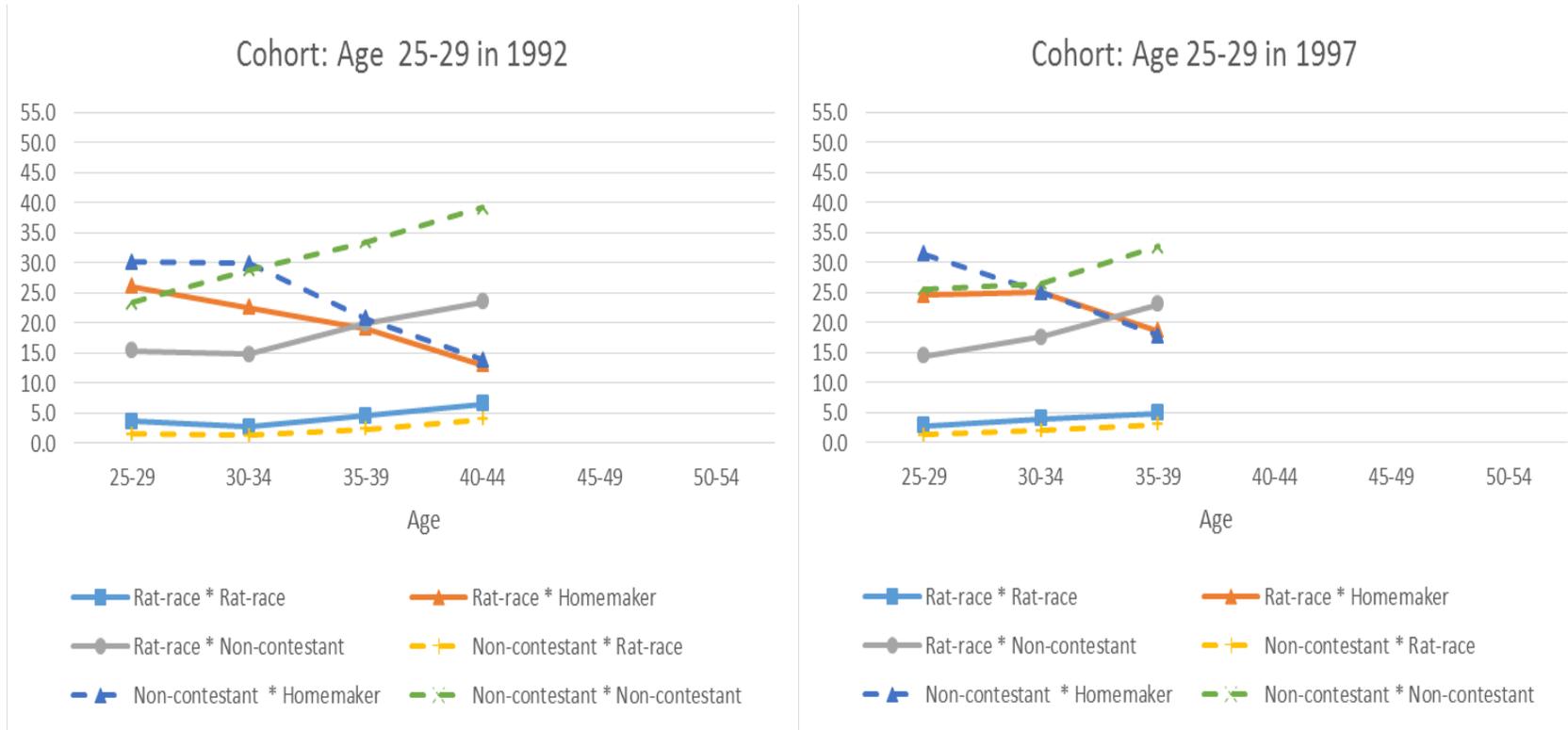


Figure 4A Career Choices of Married Women and Husbands' Participation in the Rat Race: Analysis of Cohort 30-34

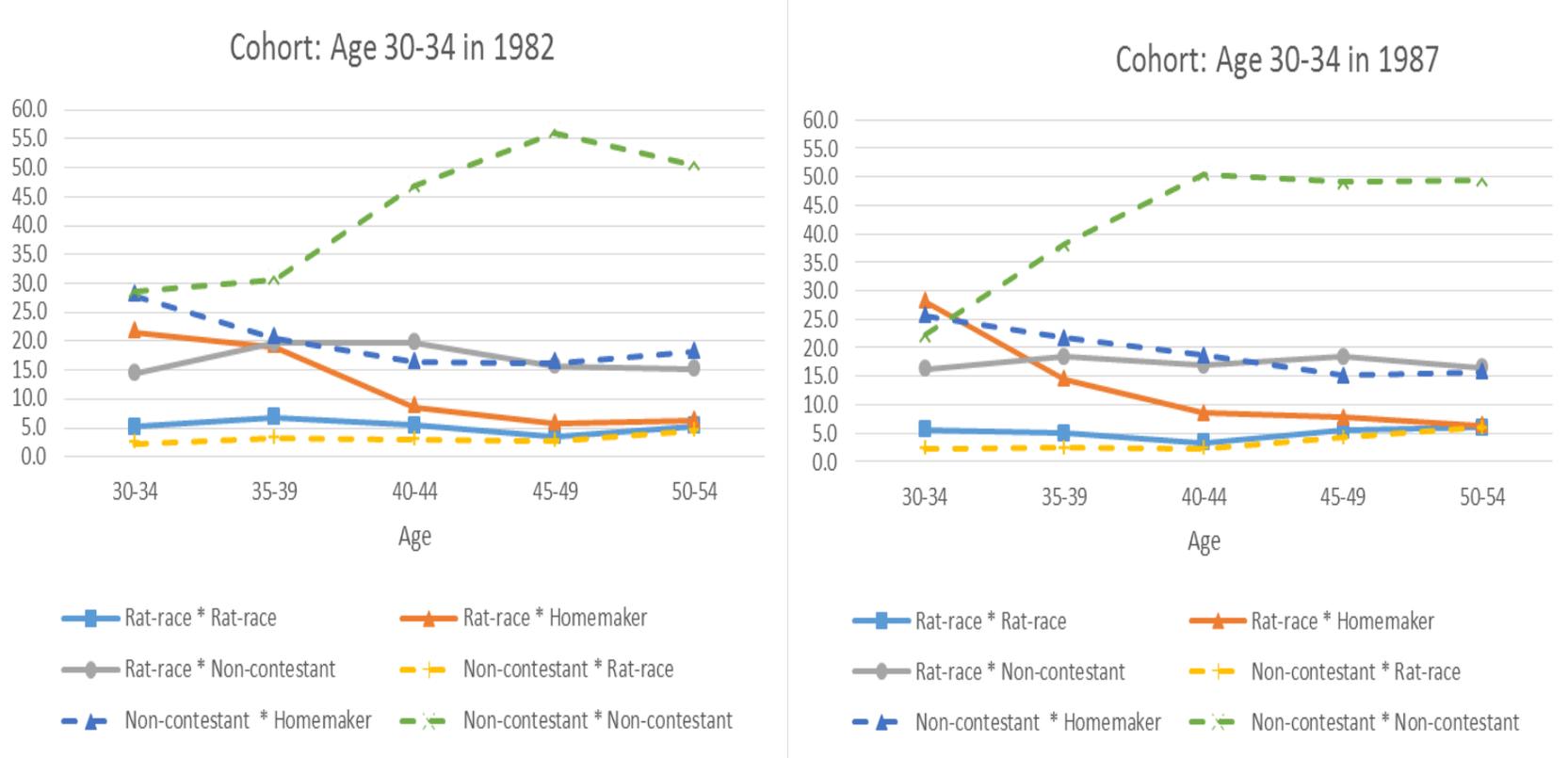


Figure 4B Career Choices of Married Women and Husbands' Participation in the Rat Race: Analysis of Cohort 30-34

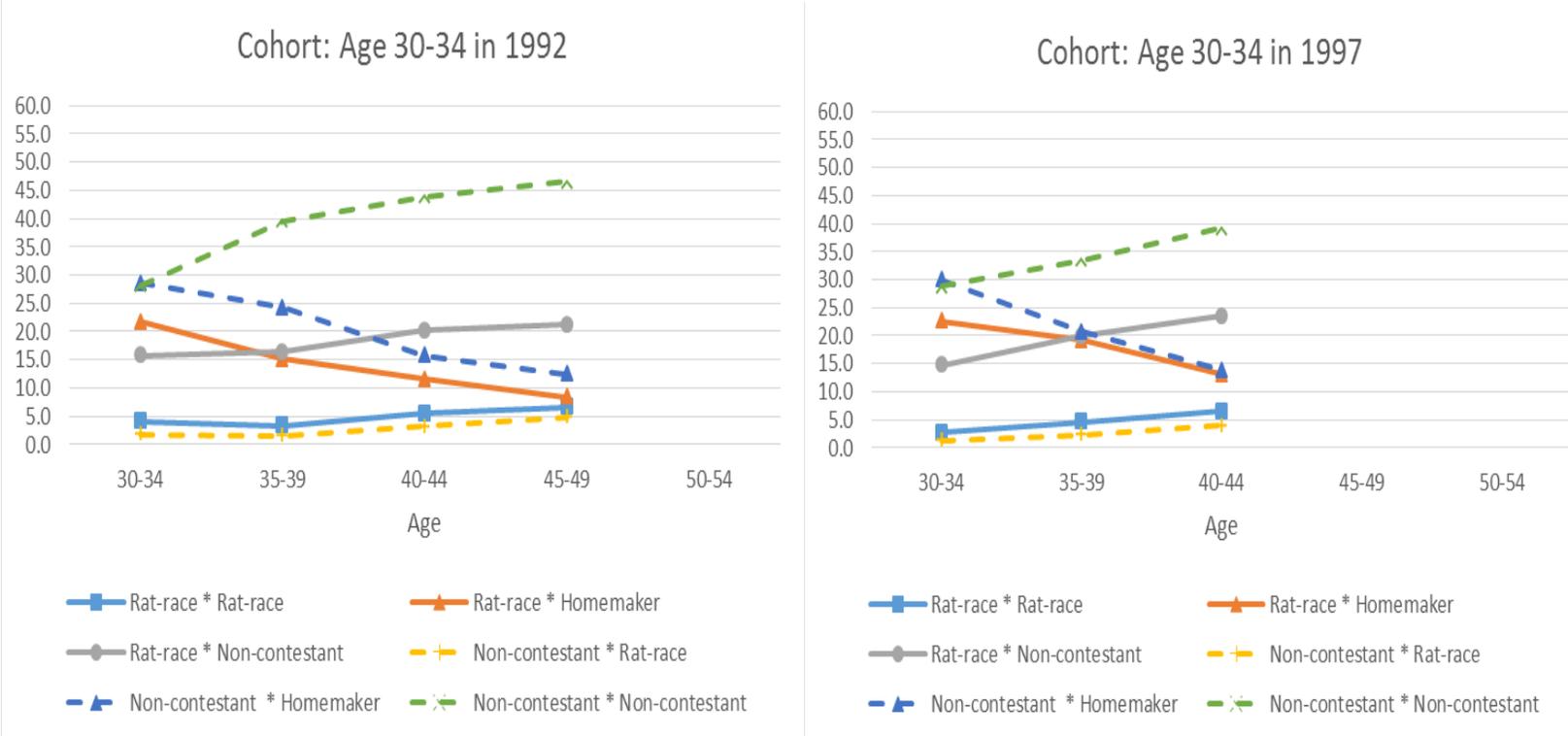


Figure 5A Career Choices of Married Women and Husbands' Participation in the Rat Race: Analysis of Cohort 35-39

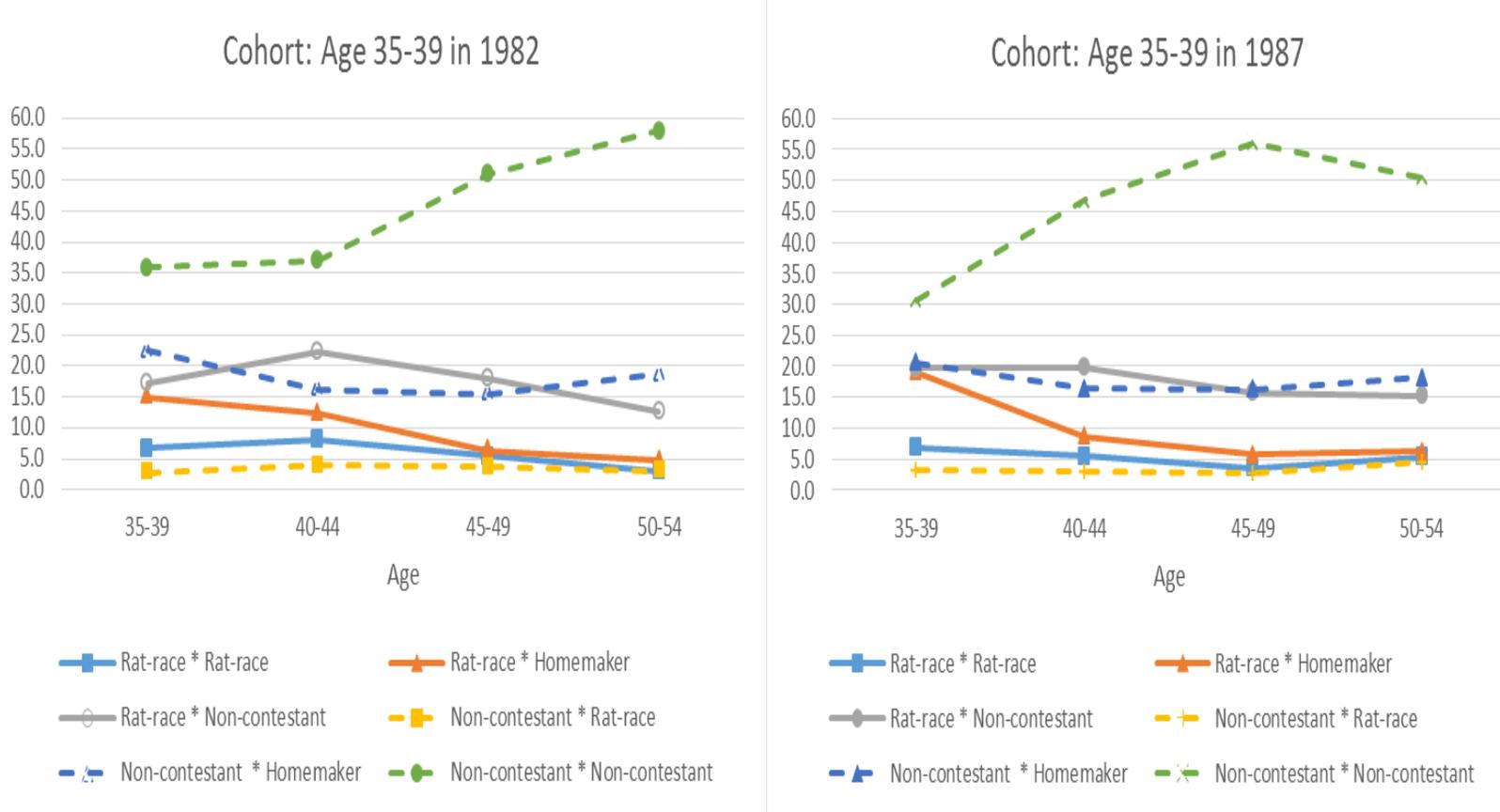


Figure 5B Career Choices of Married Women and Husbands' Participation in the Rat Race: Analysis of Cohort 35-39

