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Gender Promotion Gap in Japanese Academia in 2004-2013: Has It Changed Over Time?*

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Abstract

Using a complete survey of the entire faculty covering 2004 to 2013, we examine the gender promotion gap in Japanese academia and assess how it changed over time. The gap at the full professor rank in national and local public universities stayed constant at slightly above 7 percentage points, while the gap in private universities exhibited a mild increase from 5.9 to 8.1 percentage points. When we combine all universities, the gap shows a slight increase from 6.9 to 7.8 percentage points. Science, technology, engineering, and mathematics (STEM) fields and social science fields in national and local public universities have significantly higher gaps than other fields. We do not find consistent evidence that the two governmental grants, the 'Grant Program for Supporting Female Researchers' and the 'Grant Program to Accelerate the Reform of Training Female Researchers', that aimed to foster female academics' careers, have reduced the gender promotion gaps. We also find no evidence that these grants increased the department level share of female faculty.
JEL Classification: J7

1. Introduction

This paper examines gender promotion differences in Japanese academia using a complete survey of the entire faculty in Japan covering 2004 through 2013.[1] This paper's goals are as follows. First, we investigate the extent of gender promotion gaps in Japanese academia after controlling for observable characteristics, and then assess how these gaps have changed

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over time. To our knowledge this is the first study to use population census data for such an investigation. Second, we examine the gender promotion gap in different fields. In particular, we are interested to see whether the gaps in STEM fields are different from other fields, given the government's effort to tackle the under-representation of women in these fields. Third, we examine if the two governmental grants, 'Grant Program for Supporting Female Researchers' (hereafter Support Grant) and 'Grant Program to Accelerate the Reform of Training Female Researchers' (hereafter Acceleration Grant) have reduced the gender promotion gap. Our data set covers the period before and after the government began to offer these two grants. This study is the first attempt to examine the impact of these two grants on the promotion gap.

Achieving gender equality in academia has been an important policy agenda in Japan for more than a decade. In 2006, recognizing the low representation of women in academia and the lack of women in upper ranks, MEXT[2] invited universities to apply for the aforementioned Support Grant in which universities were given monetary grants to finance various work-balance programs.[3] In 2009, MEXT invited universities to apply for an even larger grant, the Acceleration Grant, that specifically aimed to foster the career of young female researchers in STEM fields by providing funds to the universities to hire and assist young female academics.[4]

Despite these initiatives, there is a lack of studies regarding the gender promotion differences in Japanese academia. Takahashi and Takahashi (2015) show, by using data from a mail survey conducted in 2008 for economics departments in Japan, that the gender promotion gap exists, and is most prominent in the early career, from the initial hiring to

[2] Ministry of Education, Culture, Sports, Science and Technology

[3] Typical examples of such programs are: the provision of vouchers for the use of baby sitters and the provision of grants for female researchers with young children to hire research assistants. The grant was offered only to universities that have STEM fields due to the particular low representation of women in these fields. Nevertheless, the grant could be used university-wide.

[4] The maximum grant per year was 22 million yen for the Support Grant and 80 million yen for the Acceleration Grant.

associate professor position. Unfortunately, their study is limited to a single field in a single survey year. This is a significant shortcoming since studies on the US academia consistently show that gender promotion gap vary across fields, and that the gap declined over time in many fields, as we briefly summarize below.

Kahn (1993) shows, by using the Survey of Doctorate Recipients (SDR), that median time to tenure is 7 years longer for women in economics departments.[5] McDowell et al. (2001) show, by using the data of the members of American Economic Association, that such gender promotion gap might have disappeared by the end of 1980s, while Ginther and Kahn (2004) show by using SDR data that gender promotion gaps in economics persisted well into the 1990s, with women's probability of attaining tenure lower than men by 13 to 15 percentage points.

While economics exhibits a substantial gender promotion gap, other social science fields have a better track record. Ginther and Kahn (2009) show that in social science the gender promotion gap to tenure existed in the 1980s cohorts, but this gap disappeared by the cohort of 1999, although economics was the exception with a sizable gender promotion gap. As for the natural science, Ginther and Kahn (2009) show, by using SDR data from 1973 to 2001, that there is no gender promotion gap to tenure in aggregate, with the exception of life science. As for humanities, Ginther and Hayes (2003) show, by using SDR data, that there exist gender promotion gaps of similar magnitude in both 1975-1979 and 1980-1989 cohorts, of about 5.9% to 6.5% points.[6]

The data set we utilize is the School Teachers Survey (*Gakkou Kyouin Toukei Chousa*) conducted by MEXT every three years. This is a complete survey of faculty members in tertiary education. We use the data for the full-time university faculty in four year

[5] The median time for men to be promoted to tenure is 9 years while it is 16 years for women.

[6] Earlier results of the gender promotion gaps in US academia can be found in Katz (1973). Long et al. (1993) found that women in biochemistry are 10% less likely than men to be promoted to tenure.

universities and colleges. This data set contains information of the entire faculty in Japan regarding the current ranks, total academic experience, as well as other characteristics such as educational background. The data contain university identifier, university names, as well as department names allowing us the examination of the gender promotion gaps across different fields. The data set, however, does not include publication measures; thus, the estimated gender promotion gap cannot be separated from the gender differences in productivity. Nevertheless, we consider our study to be an important addition to the knowledge of gender promotion gaps in Japanese academia given the paucity of evidence. We also note that, several existing similar studies do not control for publications, (e.g., McNabb and Wass, 1997).[7]

To preview our results, the gender promotion gap at the full professor rank in national and local public universities stayed constant approximately at 7 percentage points, while the gap in private university exhibits a mildly increasing trend from 5.9 to 8.1 percentage points. The overall gender gap increased from 6.9 to 7.8 percentage points. We did not find consistent evidence that the two governmental grants reduced the gender promotion gap, nor did we find evidence that these grants increased the department level share of female faculty.

The remainder of this paper is organized as follows. Section 2 outlines the institutional context, describes the data, and presents sample characteristics. Section 3 analyses the gender promotion gaps over time, and Section 4 examines the effects of the two governmental grants on the gender promotion gap. Section 5 concludes.

[7] Takahashi and Takahashi (2011, 2018) examine the gender salary in Japanese academia while controlling for academic productivity. They show that even after controlling for academic productivity, there are still 6 to 8 percent gender salary gaps. Takahashi and Takahashi (2010) finds that research productivity is associated with higher job mobility.

2. Institutional Background and Data

2.1 Institutional Background

Japanese universities are classified into three types: (1) national universities, (2) local public universities (prefectural and city universities), and (3) private universities. National universities are largely financed by the central government and are under considerable supervision by MEXT. Prefectural and city universities are established by local governments and are funded by both local and central governments. Private universities are established by private entities and they are generally self-supporting, receiving some financial support from the government. Most of the prestigious research universities are national universities, such as the University of Tokyo and Kyoto University.

Academic ranks in Japanese universities are: jokyo/joshu (research associate), koushi (assistant professor), jun-kyouju (associate professor), and kyoju (full professor), where the titles in the brackets are the equivalent ranks in the US academic system. During the sample period, the tenure-track system was still not common and assistant, associate and full professors were usually tenured positions at the hiring, while research associates were mostly non-tenured entry positions typically on 2-3 year fixed-term contracts.[8] Research associate positions can entail either teaching and research (jokyo) or research only (joshu). Since the number of 'joshu' is small in our sample, we combine 'joshu' and 'jokyo' into a single category called research associate.[9]

2.2 Data and Variables

This study uses the School Teachers Survey from 2004, 2007, 2010 and 2013. This is a complete survey of full time teachers in elementary, secondary, and tertiary education in Japan conducted by MEXT every three years. We restrict the sample to full-time faculty

[8] Some fixed-term positions allow renewals, although the number of times one can renew is often limited.

[9] Jokyo position was introduced in 2007, and thus, 2004 data do not contain jokyo. After the introduction of jokyo position, the job titles of the majority of joshu were changed to jokyo.

in 4-year universities[10], resulting in a sample with 89 national universities, 94 local public universities, and 607 private universities. We also restrict the sample to faculty between 24 to 62 in order to exclude individuals who might have been rehired after their retirements. The reason for not including the academics under age 24 is to eliminate misreported data, as it is unlikely for those who do not reach the master's degree-finishing age (usually 24) to be hired as full-time faculty.[11]

Table 1 reports the summary statistics of the variables used in estimations. While most of the variables are self-explanatory, some variables require explanations. The School Teachers Survey collects information about the highest degree that each faculty obtained. If the final degree is from a Japanese institution, the data indicates the type of degree (PhD, MA, BA or below). Note that those who completed their PhD courses without receiving the PhD degree are treated as equivalent to having a PhD degree, and therefore their PhD dummy takes the value one in such a case.[12] However, when a respondent obtained his or her highest degree from a foreign institution, the data only indicate this fact, without mentioning the type of the degree. Thus, our education dummies are: (1) PhD from Japan, (2) MA from Japan, and (3) highest degree from overseas. The reference category is 'BA and below from Japan'. The dummy variable, *Belongs to graduate school*, captures the potential effects of having a more research oriented position.

Inbreeding is quite common in Japanese academia (Horta et al. 2011). Inbreeding is a hiring practice where universities hire their own graduates as faculty right after the

[10]We exclude two-year colleges and technical colleges.

[11]There are very few observations whose age is below 24, which are likely to be misreporting. In unreported regressions we restricted the sample to age 27-62. Results did not change qualitatively, however.

[12]It had been a common practice for Japanese universities not to grant PhD degree immediately after the completion of the PhD courses. The students who completed the courses but did not received the PhD degree had to obtain academic jobs without the degree. Then, only after these students accumulated substantial amount of academic work over the course of their academic careers, did the universities grant the PhD degrees to these students. It sometimes takes more than a decade for these students to obtain their PhD degree. The system has changed in the recent years, and most of the universities now grant PhD degrees immediately after the completion of the PhD courses. For this reason, we consider those who completed the PhD courses without the degree to be equivalent to those who have completed the PhD course with the degree.

completion of a graduate degree. Morichika and Shibayama (2015) examine the longitudinal data of academic productivity in the University of Tokyo and find that inbreeding has negative effects on academic productivity. The School Teachers Survey has information: (i) if a faculty obtained both the BA and the graduate degree from his or her current institution, or (ii) if the faculty obtained only the graduate degree from his or her current institution. While data do not tell if these faculty were hired into the current institution *directly after* the completion of the graduate degree, they would partly capture the effects of inbreeding on promotion. Hence, we include two dummy variables: alma mater of both undergraduate and graduate school, and alma mater of the graduate school only. A sizable portion of the sample has a degree from the universities where they are currently working: 28% of all faculty obtained both undergraduate and graduate degrees from the current institution, while 6.7% of them obtained only their graduate degrees from their current institutions. These statistics confirm the observation in Horta et al. (2011) that academic inbreeding is common in Japanese academia.

According to Table 1, women are under-represented in full professor positions and are over-represented in assistant professor and research associate positions. On average, women are younger and less experienced than men. In addition, fewer percentage of women than men have PhD degree: 51.5% of men and 37.3% of women received Ph.D. degrees from Japan. The percentage of women who work in national universities is much lower than that of men (42.3% for men and 25.5% for women), indicating that women are under-represented in research oriented positions since national universities tend to be more research-oriented. This is also confirmed by the statistics that a lower percentage of women belong to graduate schools than men (22.6% for men and 12.2% for women).

Although the number of national universities is much smaller than that of private universities, national universities account for 39% of total faculty hired. This is because national universities typically have many departments hiring many faculty, while private universities tend to have fewer departments. Private universities account for 53.4% of the total observations. The rest is hired by the local public universities. The distribution of genders varies substantially across fields. In particular, women are grossly under-represented in STEM fields.

Figure 1 illustrates the percentage of full professors in each academic experience category using a binned graph, showing that women are less likely to be in the rank of professor at any given academic experience (except the last experience category). In particular, the gender gap increases considerably after 20 years of experience and at experience 35 the gap is as much as 0.24. The share of professors for the male sample drops after 35 years of experience. This can be either because male professors who do not have promotion prospects stay in academia longer, or because some full professors retire early and then rehired at lower ranks. We do not have information to judge which explanation is more likely. We ultimately decided to keep the observations above experience 35 years, since dropping them do not much affect the estimation results.[13]

3. Estimation Results

3.1 Basic Results

We apply the ordered probit model to estimate the gender gap in rank attainment:

$$Rank^*_{i,j,t} = X'_{i,j,t}\beta + a_j + u_{i,j,t} \tag{1}$$

where the subscript i is the individual identifier, which is not unique across the different waves of the census. Thus, we are not able to keep track of individuals over time. The subscript, j, is the university identifier, which is unique across different waves of the census. The subscript, t, is the year identifier. a_j is the university fixed effect. Note that this model

[13] There are 12,176 observations whose tenure is greater than 35 years, which is 2 percent of the total observations.

does not suffer from the incidental parameter problem, as the number of observations can increase while holding constant the number of academic units. $u_{i,j,t}$ is the standard error term, which is assumed to follow the standard normal distribution. $X_{i,j,t}$ is the vector of observed characteristics, outlined in the previous section.

$Rank^*_{ijt}$ is a latent variable for the rank attainment for the observation i, such that $Rank_{ijt}$=1, 2, 3, 4 indicates that the individual is (1) a research associate, (2) an assistant professor, (3) an associate professor, or (4) a full professor, respectively. Gender differences are estimated by including a female dummy.

Table 2 reports the regression results. The first four rows show the marginal effects of being a female on the probability of being a full professor position for each year, and the rest of the rows shows the estimated coefficients. Model 1 pools all the universities, Model 2 restricts the sample to national and local public universities, and Model 3 restricts the sample to private universities.

Figure 2 plots the computed marginal effects in Table 2. According to Model 1 that includes all the universities, women are 6.9 percentage points less likely than men to be in the full professor position in 2004, and this gender gap slightly increased to 7.8 percentage points in 2013. For national and local public universities, the gender promotion gap is almost unchanged during the sample period, hovering between 7.4 to 7.8 percentage points. For private universities, the gender promotion gap of being a full professor is 5.9 percentage points in 2004 and increases to 8.1 percentage points in 2013. Thus, the gender promotion gap was smaller for private universities in 2004, but the gap is slightly greater for private universities at the end of our sample period.

We now examine the gender promotion gaps separately for the following fields: humanities related (humanities, education and art), social sciences, STEM (sciences, technology, engineering and math)[14], and medical. These groups cover all the fields, except the home science field, which is a very small and inter-disciplinary field and thus is dropped from the sample. In addition, we separately estimate the gender gaps for (1) national and local public universities, and (2) private universities. Figure 3 shows the marginal effect of female on the probability of being a full professor for national and local public universities, and Figure 4 shows the marginal effects for private universities. Table 3 and Table 4 show the corresponding estimation results.

For national and local public universities (Figure 3), social sciences and STEM fields have consistently higher gender gaps than the other two fields, humanities and medical fields. However, the gaps for the 'high gap group' (social sciences and STEM) exhibits a downward trend throughout the sample period. The gap for social sciences was 23.7 percentage points in 2004, but reduced to 16.5 percentage points in 2013.[15] The gap in STEM fields was 15.9 percentage points in 2004 but it narrowed to 11.7 percentage points in 2013. As for the 'low gap group', the gender gap slightly increased over the sample period. The gap in the humanities related fields was 6.8 percentage points in 2004 and it increased slightly to 8.5 percentage points in 2013 while the gap for the medical field was 4.3 percentage points in 2004 and it increased to 5.5 percentage points in 2013.

For private universities (Figure 4), STEM fields have a consistently higher gender promotion gap than the rest of the fields. The gap was 8.9 percentage points in 2004 and mildly increased to 10 percentage points in 2013. The rest of the fields (humanities related, social sciences, medical) have smaller gaps than STEM. These gaps mildly increased until 2010, ranging between 5 to 8 percentage points. Then, the gap starts to diverge. Medical field and humanities continued to exhibit a mildly increasing trend, while social sciences

[14] This includes agriculture.

[15] We do not separately estimate the model for economics, since our preliminary estimation results show that the trend in the estimated gender gap is similar to the rest of the social science fields.

exhibit a decrease.[16]

In sum, in national and local public universities, the gender promotion gaps are exceptionally higher in STEM and social science fields. Gender promotion gaps in these fields narrowed during the 10 years of the sample period, but the gaps at the end of the sample period were still considerably higher than other fields. In other fields, the gender promotion gaps were mildly increasing. For private universities, STEM fields have relatively higher gender promotion gap than other fields, with a mildly increasing trend.

In aggregate, the gender promotion gap in national and local public universities stayed constant at slightly above 7 percentage points, while the gap in private universities exhibited an increasing trend from 5.9 to 8.1 percentage points. When we combine public and private universities, the gender gap exhibited a slightly increasing trend, from 6.9 to 7.8 percentage points during the sample period. Thus, one takeaway from our results is that the gender promotion gaps in Japanese academia gender did not improve over time.

4. The effects of the two governmental programs on the gender promotion gap

As noted in the introduction, the Japanese government provided two grants, the Support Grant and the Acceleration Grant to reduce gender inequality in terms of representation and promotion. To estimate the effects of these grants, ideally we separately include in a regression the following two dummy variables: *After Support Grant* and *After Acceleration Grant*, which take the value one in the year in which a university receives the respective grants. We have to use a modified approach, however, since in our case all the universities that received the Acceleration Grant had previously received the Support Grant. Therefore, we cannot estimate the effects of the Acceleration Grant separately from that of the Support

[16] In an unreported regression, we estimated this model separately for economics. The trend in the gender promotion gap was not much different from the rest of the social sciences.

Grant. Our actual estimations use the following two dummy variables:

$(Support\ Grant\ Only)_{jt}$: This dummy variable takes the value 1 on or after the university j receives the Support Grant. In addition, we impute the value 1 even after the grant expires, to capture potentially long lasting effects of the grant. This dummy variable, however, takes the value 0 after the university receives the Acceleration Grant in the case the university receives this grant.

(Support & Acceleration Grant)$_{jt}$: This dummy variable takes the value one on or after the period university j received the Acceleration Grant. The name of the variable contains *'Support &'* because, as noted above, all the universities that received the Acceleration Grant had previously received the Support Grant, and thus, we cannot estimate the effects of each grant separately.[17]

Because of the construction of these variables, the treatment group is the universities that never received either grants during our sample period. The treatment groups are, thus, (1) universities that received only Support Grant during the sample period, and (2) universities that received both Support and Acceleration grant during our sample period.

To estimate the effects of these grants on gender promotion gap, we also need to take into account the possibility that these treatment groups might have had pre-existing differences in gender promotion gaps. Thus, we additionally create two time invariant dummy variables, *Ever Received Support Grant Only* for the treatment group (1), *Ever Received Supp. & Accel. Grant* for these treatment groups, (1) and (2).

We estimate the effects of these grants on gender promotion gap by using the following linear probability model with university fixed effects:

$$\begin{aligned}(Above\ Assistant\ Prof)_{ijt} &= \alpha_1(Female)_i(Year04)_t + \alpha_2(Female)_i(Year07)_t \quad (2)\\ &+ \alpha_3(Female)_i(Year10)_t + \alpha_4(Female)_i(Year13)_t\end{aligned}$$

[17]The duration of these grants are usually 4 years, but the effects of these grants are likely to last after the expiration. That is why this dummy should take a value 1 even after the expiration of the grant.

$$+ \quad \beta_1(Ever\ Received\ Support\ Grant\ Only)_j(Female)_i$$

$$+ \quad \beta_2(Ever\ Received\ Supp.\ \&\ Accel.\ Grant)_j(Female)_i$$

$$+ \quad \gamma_1(Support\ Grant\ Only)_{jt}(Female)_i$$

$$+ \quad \gamma_2(Support\ \&\ Acceleration\ Grants)_{jt}(Female)_i$$

$$+ \quad X'_{ijt}\beta + a_j + \theta_j D_j t + u_{it}$$

The dependent variable is the dummy variable that takes the value zero if the academic's rank is research associate, the lowest academic rank, and one if the academic's rank is assistant professor or above. The reason we focus on the early promotion is because these two grants focused on helping the career of entry level female academics, and thus, the effects of these variables are expected to be different for the early promotion than for the later promotions (i.e., from an assistant professor to an associate professor, and from an associate professor to a full professor).

α_1 to α_4 capture the gender promotion gap for the control group. β_1 and β_2 capture the pre-existing differences in the gender promotion gap for the two treatment groups. The coefficients of our interest are γ_1 and γ_2. γ_1 captures the effect of receiving the Support Grant only on the gender promotion gap. γ_2 captures the effects of receiving both grants on the gender promotion gap.

X_{ijt} is a vector of other control variables. We control for the university fixed effects, a_j, to capture the differences in the speed of promotion among different universities. D_j is the university dummy, and θ_j is the coefficient for the university specific linear time trend. The inclusion of these trends imposes a significant computational burden, and this is the reason why we use linear probability models instead of probit models.

Table 5 shows the result. Before showing the main estimations that use *Above Assistant Prof*$_{it}$ as the dependant variable, Model 1 uses an ordered dependent variable to be consistent with our earlier estimations that use ordered dependent variables. This model uses the probit-adapted OLS estimation proposed by van Praag and Ferrer-i-Carbonell (2004), because estimating this model with ordered probit is infeasible due to the inclusion of university specific time trends.[18] Probit-adapted OLS first transforms *Rank* into a standard-normally distributed, cardinally scaled variable, Y, as follows:

$$Y_s = E(Z|Z_{s-1} \leq Z \leq Z_s) = [\phi(Z_{s-1}) - \phi(Z_s)]/[\Phi(Z_s) - \Phi(Z_s)] \quad (3)$$

where, Z is the standard normal distribution, and Z_s is the cutoff point such that $P(Z \leq Z_s)$=the cumulative frequency at Rank=s.[19] We then estimate an OLS regression using this variable as the dependent variable.

Model 1 includes all the universities in the sample. As can be seen, the effect of receiving only the Support Grant has no effect, as the estimated γ_1 is small and statistically insignificant. The estimated γ_2 is positive and statistically significant, which indicates that receiving both grants might have reduced the gender promotion gap. Model 2 estimates the linear probability model with *Above Assistant Prof* as the dependent variable. The estimated γ_1 is again small and statistically insignificant. The estimated γ_2 is positive and statistically significant, again indicating that receiving both Support and Acceleration grant might have reduced the gender promotion gap.

Model 3 estimates the same model for national and local public university sample. Estimated γ_1 and γ_2 are small and statistically insignificant. Model 4 estimates the same model for private university. This model does not estimate γ_2 because no private universities have ever received Acceleration Grant. The estimated γ_1 is again small and insignificant.

Note however that the primary targets of these two grants were the STEM fields. The support grants were given only to universities with STEM fields, although the university

[18]The application of this method can be found in Stevenson and Wolfers (2008), Luechinger (2009), and Luechinger et al. (2010).
[19]Z_1=-∞ and Z_4=∞.

had the discretion to use this grant for other fields. The usage of the Acceleration Grant was limited to supporting young female researchers in STEM fields only. In addition, there is no private university that received the Acceleration Grant during our sample period. Thus, the estimated γ_1 and γ_2 might mistakenly capture a possible field specific time trend, or possibly different time trends between national and local public university and private universities. In order to eliminate these possibilities, we estimate the same model for STEM fields.

Model 1 in Table 6 restricts the sample to STEM fields, but includes national, local public, and private universities. The estimated γ_1 is still small and statistically insignificant. The estimated γ_2 is 0.045, and is marginally significant, indicating that the combination of Support and Acceleration Grants might have reduced the gender promotion gap by 4.5 percentage points. Note, however, that the pre-existing gender promotion gap for universities that received both grants is 12.3 percentage points higher than that of the universities that never received either grants. Thus, even if the gender promotion gap reduced by 4.5%, these universities still have a much higher gender promotion gap than the rest of the universities.

Model 2 in Table 6 further restrict sample to national and local public universities only. The estimated effect of Support Grant has become negative and statistically significant. If we take this result at face value, the Support Grant *increased* the gender promotion gap in national and local public universities. The estimated γ_2 is now small and statistically insignificant, indicating that receiving both Support and Acceleration Grant has not changed the gender promotion gap in these universities.

Model 3 in Table 6 estimates the same model for private universities. Since none of the private universities received the Acceleration grant during our sample period, we can only estimate the effects of receiving the Support Grant only. The estimated γ_1 is 0.075 and is statistically significant at the 5 percent level, indicating that the Support Grant reduced the gender promotion gap by 7.5 percentage points. However, note that the universities that received the grant have a pre-existing excess gender gap of 8.4 percentage points. Thus, the Support Grant simply eliminated the pre-existing excess gender promotion gap, so that these universities have a gender promotion gap that is roughly the same as the control group.

Overall, the results are not consistent across different models. The effects of the Support Grant is estimated to be nearly zero, positive, or negative. The effects of the Support and Acceleration grants are estimated to be near zero, or positive. Given this inconsistency, we believe that these results are too weak to support the hypothesis that these two grants helped reduce the gender promotion gaps.

Although these grant might not have reduced the gender promotion gaps, these grants might have helped female researchers in another way. Universities could hire a young female researchers in a research associate position using these grants. These positions tend to be of limited term, and thus, may not increase the speed of promotion. However, an increase in the chance of being hired is definitely beneficial.

If this is the case, these grants might have increased the share of female faculty. To test this hypothesis, we estimate the following model.

$$\begin{aligned}(Female\ share)_{jkt} &= \beta_0 + \beta_1 (Support\ Grant\ Only)_{jt} \\ &+ \beta_2 (Support\ \&\ Acceleration\ Grants)_{jt} \\ &+ X'_{jkt}\beta + a_{jk} + u_{jkt}\end{aligned} \tag{4}$$

where j is the index for university, k is the index for departments, and t is the index for the year. X_{jkt} includes department level control variables. Since some departments may attract more female researchers due to their specializations, such as the department of literature, we include the department level fixed effect a_{jk}.

Figure 5 shows the histogram of the department level female share. The histogram is drawn with the width of 0.01. The greatest concentration of distribution is at zero, with 23.8 percent of all departments having no female faculty. The average female share is 0.214. Figure 6 shows the histogram of female share restricting to STEM fields. Again, the greatest concentration of female share is at zero where a staggering 53.7 percent of departments has no female faculty. The average female share in STEM is 0.059.

Table 7 shows the estimation results. Model 1 includes department level fixed effects. The coefficients for both *Support Grant Only* or *Support & Acceleration* are very small and are statistically insignificant. Model 2 includes university specific time trends. Again, the estimated effects of both grants on female share are small and statistically insignificant. Finally, we run the same regression by restricting the sample to STEM fields in Model 3. Our two focal coefficients are again very small and statistically insignificant. Thus, we reject the hypothesis that these grants helped female researcher by increasing the chance of being hired into academia in a statistically measurable way.

5. Conclusion

Despite large resources being devoted to increasing women's representation in academia in Japan, there is a lack of literature documenting the gender promotion differences. Using the complete survey of the entire faculty in Japan covering 2004-2013, we examined the gender promotion gap in Japanese academia and assess how it changed over the sample period. We then examined how the two governmental grants, the *Support Grant* and the *Acceleration Grant* that aimed to support young female researchers, have affected the gender promotion gaps.

Results show that the gender promotion gap at the full professor rank in national and local public universities stayed constant at slightly above 7 percentage points, while the gap in private universities exhibited a mildly increasing trend, from 5.9 to 8.1 percentage points, over the sample period. Overall gender gap, combining private, national, and local public universities, slightly increased from 6.9 to 7.8 percentage points. STEM and social sciences fields in national and local public universities have significantly higher gaps as compared to other fields. The gaps in STEM and social sciences did reduce considerably over time, though they are still higher than the rest of the fields.

We do not find consistent evidence that the two governmental grants reduced gender gap. One possible explanation is that, such grants might have helped female researchers by providing more positions for them, but with poor promotion prospects. If this is the case, we might observe an increase in the share of female faculty. However, we do not find evidence of an increase in the female share.

Previous work in the US academia has shown the gender promotion gaps narrowed over time. In contrast, over our sample period, the gender promotion gap in Japanese academia has not reduced, and the two grants that were meant to reduce this gap did not seem to help reduce it. One caveat of this study is that we did not pin down the exact causes of these gender promotion gaps. Additional work that would illuminate the sources of the gender promotion gap would be useful in reducing these gaps.

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Table 1: Summary Statistics

	All(n=620,849)		Female(n= 122,745)		Male(n=498,104)	
Variables	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Female	0.198	(0.398)	-	-	-	-
Ranks						
Full professor	0.361	(0.480)	0.217	(0.412)	0.397	(0.489)
Associate professor	0.256	(0.436)	0.251	(0.433)	0.257	(0.437)
Assistant professor	0.126	(0.332)	0.175	(0.380)	0.115	(0.319)
Lecturer	0.256	(0.437)	0.358	(0.479)	0.231	(0.422)
Age	46.309	(9.756)	43.787	(9.888)	46.930	(9.622)
Academic experience	12.158	(10.307)	9.132	(9.174)	12.903	(10.434)
BA & below (excluded category)	0.223	(0.416)	0.269	(0.4436)	0.211	(0.408)
PhD from Japan	0.487	(0.500)	0.373	(0.483)	0.515	(0.500)
MA from Japan	0.247	(0.431)	0.295	(0.456)	0.236	(0.424)
Final degree abroad	0.043	(0.204)	0.063	(0.244)	0.038	(0.192)
Alma mater BA&graduate level	0.282	(0.450)	0.233	(0.423)	0.294	(0.455)
Alma mater graduate school	0.066	(0.249)	0.073	(0.260)	0.065	(0.246)
Belongs to graduate school	0.205	(0.404)	0.122	(0.327)	0.226	(0.418)
National university	0.390	(0.488)	0.255	(0.436)	0.423	(0.494)
Local public university	0.076	(0.265)	0.100	(0.300)	0.070	(0.255)
Private university	0.534	(0.499)	0.645	(0.479)	0.507	(0.500)
Fields						
Humanities	0.145	(0.353)	0.208	(0.406)	0.130	(0.336)
Education	0.055	(0.229)	0.069	(0.253)	0.052	(0.222)
Art	0.028	(0.164)	0.037	(0.189)	0.025	(0.157)
Social siences	0.129	(0.335)	0.114	(0.318)	0.133	(0.339)
Sciences	0.089	(0.284)	0.036	(0.187)	0.101	(0.302)
Engineering	0.154	(0.361)	0.036	(0.187)	0.183	(0.387)
Agriculture	0.043	(0.203)	0.019	(0.136)	0.049	(0.216)
Medical	0.345	(0.475)	0.434	(0.496)	0.323	(0.468)
Home science	0.012	(0.109)	0.047	(0.211)	0.003	(0.058)
Year 2004	0.238	(0.426)	0.197	(0.398)	0.248	(0.432)
Year 2007	0.248	(0.432)	0.236	(0.424)	0.251	(0.434)
Year 2010	0.256	(0.436)	0.268	(0.443)	0.253	(0.434)
Year 2013	0.258	(0.438)	0.299	(0.458)	0.248	(0.432)

Figure 1: The share of full professors by experience

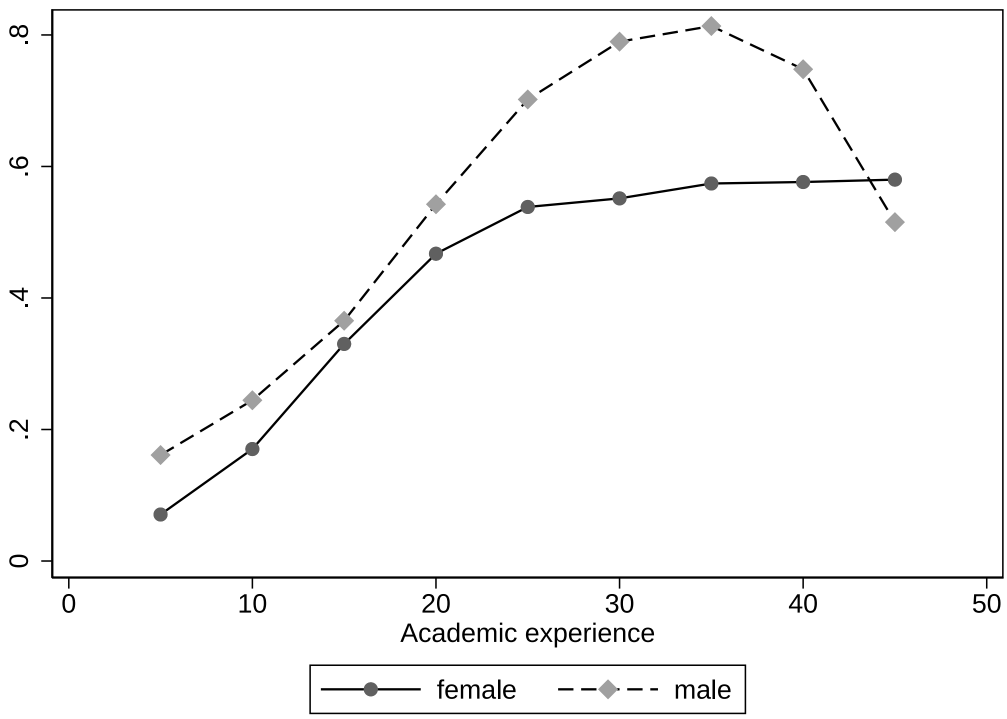
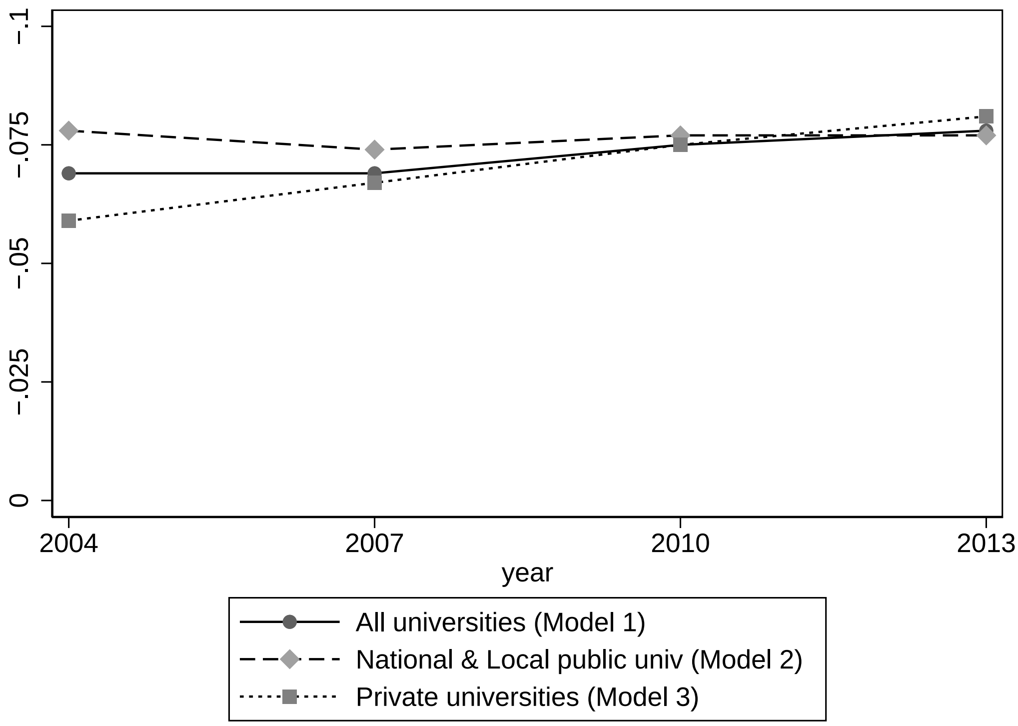


Figure 2: Gender promotion gap at the full professor rank: All fields



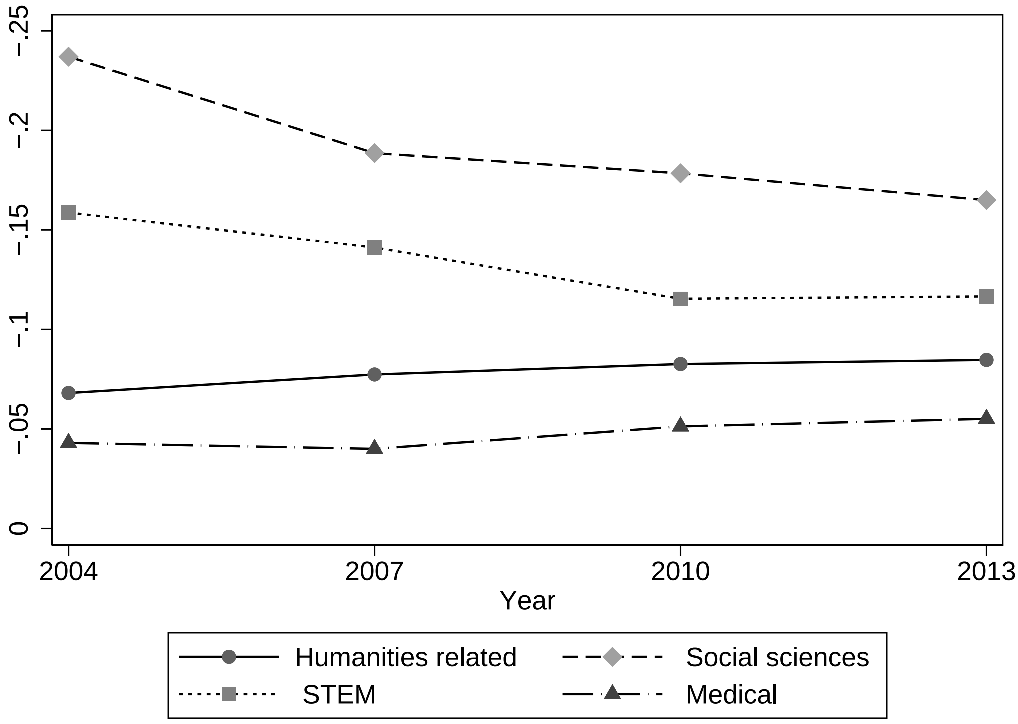
This figure plots the marginal effects in Table 2

Table 2: Gender promotion gaps (ordered probit)

Variables	Model 1 All universities	Model 2 National & local public universities	Model 3 Private universities
Marginal effects			
Female×Year 2004	-0.069***	-0.078***	-0.059***
	(0.004)	(0.007)	(0.004)
Female×Year 2007	-0.069***	-0.074***	-0.067***
	(0.003)	(0.006)	(0.003)
Female×Year 2010	-0.075***	-0.077***	-0.075***
	(0.003)	(0.005)	(0.003)
Female×Year 2013	-0.078***	-0.077***	-0.081***
	(0.003)	(0.005)	(0.003)
Coefficients			
Female× Year 2004	-0.349***	-0.383***	-0.319***
	(0.018)	(0.031)	(0.021)
Female×Year 2007	-0.352***	-0.360***	-0.361***
	(0.014)	(0.029)	(0.016)
Female×Year 2010	-0.380***	-0.376***	-0.405***
	(0.013)	(0.024)	(0.016)
Female×Year 2013	-0.395***	-0.375***	-0.438***
	(0.013)	(0.024)	(0.017)
Age	0.191***	0.167***	0.224***
	(0.009)	(0.010)	(0.015)
Age squared	-0.071***	-0.045***	-0.102***
	(0.009)	(0.011)	(0.015)
Academic experience	0.071***	0.068***	0.073***
	(0.003)	(0.003)	(0.004)
Academic experience squared	-0.195***	-0.187***	-0.205***
	(0.007)	(0.009)	(0.012)
PhD from Japan	0.553***	0.510***	0.629***
(Excluded=BA&below from Japan)	(0.020)	(0.028)	(0.026)
MA from Japan	0.366***	0.395***	0.309***
	(0.019)	(0.028)	(0.025)
Final degree abroad	0.299***	0.385***	0.267***
	(0.032)	(0.057)	(0.034)
Alma mater BA&graduate level	-0.390***	-0.307***	-0.476***
	(0.043)	(0.061)	(0.045)
Alma mater graduate level	-0.446***	-0.407***	-0.453***
	(0.028)	(0.036)	(0.046)
Belongs to graduate school	0.172***	0.138***	0.543***
	(0.029)	(0.025)	(0.059)
Prefectural or City university	-0.001	0.070	
(Excluded=Nat. university)	(0.046)	(0.055)	
Private university	0.454***		
	(0.035)		
Year=2007	-0.009	-0.039***	0.023**
	(0.007)	(0.008)	(0.011)
Year=2010	-0.094***	-0.125***	-0.062***
	(0.008)	(0.009)	(0.014)
Year=2013	-0.160***	-0.201***	-0.122***
	(0.010)	(0.010)	(0.018)
Field dummies	Yes	Yes	Yes
University fixed effects	Yes	Yes	Yes
Observations	620,849	289,150	331,699

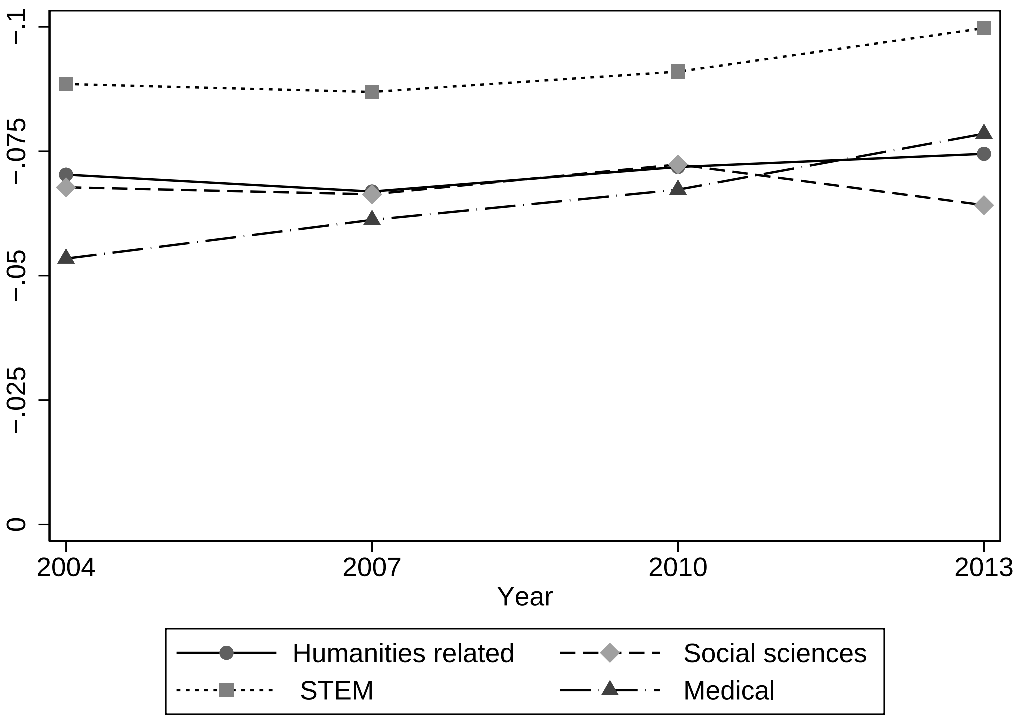
Inside brackets are robust standard errors. *,**,*** significant at the 10%, 5%, and 1% levels. Field are: Humanities, Social Sciences, Sciences, Engineering, Agriculture, Medical, Home science, Education, Art.

Figure 3: Gender promotion gap by fields: National and local public Universities



This figure is based on the marginal effects in Table 3.

Figure 4: Gender promotion gap by fields: Private universities



This figure plots the marginal effects in Table 4

Table 3: Gender promotion gaps by fields in national and local public universities (ordered probit)

	Model 1	Model 2	Model 3	Model 4
Variables	Humanities related	Social sciences	STEM	Medical
Marginal effects				
Female×Year 2004	-0.068***	-0.237***	-0.159***	-0.043***
	(0.008)	(0.021)	(0.011)	(0.006)
Female×Year 2007	-0.077***	-0.189***	-0.141***	-0.040***
	(0.009)	(0.021)	(0.011)	(0.007)
Female×Year 2010	-0.083***	-0.178***	-0.115***	-0.051***
	(0.007)	(0.020)	(0.012)	(0.006)
Female×Year 2013	-0.085***	-0.165***	-0.117***	-0.055***
	(0.007)	(0.019)	(0.010)	(0.006)
Coefficients				
Female×Year 2004	-0.310***	-1.053***	-0.677***	-0.272***
	(0.037)	(0.092)	(0.049)	(0.035)
Female×Year 2007	-0.352***	-0.838***	-0.602***	-0.253***
	(0.038)	(0.091)	(0.046)	(0.041)
Female×Year 2010	-0.376***	-0.793***	-0.493***	-0.324***
	(0.031)	(0.090)	(0.052)	(0.040)
Female×Year 2013	-0.385***	-0.733***	-0.498***	-0.348***
	(0.029)	(0.082)	(0.042)	(0.040)
Age	0.111***	0.090***	0.347***	0.244***
	(0.017)	(0.026)	(0.011)	(0.018)
Age squared	0.021	0.027	-0.227***	-0.121***
	(0.019)	(0.032)	(0.012)	(0.019)
Academic experience	0.063***	0.083***	0.012***	0.107***
	(0.005)	(0.007)	(0.004)	(0.005)
Academic experience squared	-0.118***	-0.221***	-0.062***	-0.284***
	(0.016)	(0.025)	(0.013)	(0.013)
PhD from Japan	0.677***	0.591***	0.936***	0.369***
(Excluded=BA& below from Japan)	(0.081)	(0.183)	(0.079)	(0.020)
MA from Japan	0.466***	0.429**	0.834***	0.152***
	(0.081)	(0.180)	(0.073)	(0.035)
Final degree abroad	0.285***	0.619***	0.985***	0.313***
	(0.099)	(0.188)	(0.117)	(0.111)
Alma mater BA&graduate level	-0.234***	-0.044	-0.151**	-0.392***
	(0.059)	(0.169)	(0.073)	(0.035)
Alma mater graduate level	-0.353***	-0.456***	-0.360***	-0.397***
	(0.040)	(0.105)	(0.049)	(0.035)
Belongs to graduate school	0.169***	0.150**	0.038*	0.306***
	(0.048)	(0.072)	(0.023)	(0.059)
Prefectural or City univ	0.230***	2.974***	5.959***	0.163***
(Excluded=Nat univ)	(0.060)	(0.227)	(0.159)	(0.046)
Year=2007	-0.051***	-0.039	-0.035***	-0.047**
	(0.018)	(0.028)	(0.009)	(0.019)
Year=2010	-0.144***	-0.154***	-0.123***	-0.146***
	(0.028)	(0.030)	(0.013)	(0.023)
Year=2013	-0.199***	-0.269***	-0.210***	-0.219***
	(0.029)	(0.036)	(0.012)	(0.022)
University fixed effects	Yes	Yes	Yes	Yes
Observations	51,250	25,293	117,318	93,454

Inside brackets are robust standard errors. *,**,***= significant at the 10%, 5%, and 1% levels. Public universities are: national, prefectural and city universities. Humanities related includes: Humanities, Education and Art. STEM includes: Sciences, Engineering and Agriculture.

Table 4: Gender promotion gaps by field in private universities (ordered probit)

	Model 1	Model 2	Model 3	Model 4
Variables	Humanities related	Social science	STEM	Medical
Marginal effects				
Female×Year 2004	-0.070***	-0.068***	-0.089***	-0.053***
	(0.006)	(0.007)	(0.011)	(0.007)
Female×Year 2007	-0.067***	-0.066***	-0.087***	-0.061***
	(0.005)	(0.007)	(0.009)	(0.004)
Female×Year 2010	-0.072***	-0.072***	-0.091***	-0.067***
	(0.005)	(0.006)	(0.009)	(0.005)
Female×Year 2013	-0.074***	-0.064***	-0.100***	-0.079***
	(0.004)	(0.006)	(0.009)	(0.005)
Coefficients				
Female×Year 2004	-0.307***	-0.349***	-0.400***	-0.422***
	(0.026)	(0.037)	(0.047)	(0.061)
Female×Year 2007	-0.292***	-0.342***	-0.393***	-0.483***
	(0.023)	(0.035)	(0.041)	(0.035)
Female×Year 2010	-0.314***	-0.373***	-0.412***	-0.531***
	(0.021)	(0.028)	(0.039)	(0.041)
Female×Year 2013	-0.325***	-0.331***	-0.451***	-0.620***
	(0.020)	(0.031)	(0.041)	(0.044)
Age	0.216***	0.222***	0.326***	0.298***
	(0.020)	(0.023)	(0.024)	(0.014)
Age squared	-0.103***	-0.103***	-0.192***	-0.159***
	(0.020)	(0.023)	(0.025)	(0.014)
Academic experience	0.097***	0.125***	0.046***	0.056***
	(0.005)	(0.006)	(0.005)	(0.008)
Academic experience squared	-0.223***	-0.319***	-0.189***	-0.173***
	(0.014)	(0.017)	(0.016)	(0.022)
PhD from Japan	0.607***	0.182***	0.934***	0.514***
(Excluded=BA& below from Japan)	(0.034)	(0.053)	(0.074)	(0.028)
MA from Japan	0.272***	-0.107**	0.704***	0.138***
	(0.030)	(0.050)	(0.068)	(0.037)
Final degree abroad	0.153***	0.079	0.878***	0.254*
	(0.049)	(0.069)	(0.102)	(0.140)
Alma mater BA&graduate level	-0.382***	-0.333***	-0.407***	-0.390***
	(0.050)	(0.075)	(0.062)	(0.054)
Alma mater graduate level	-0.466***	-0.590***	-0.456***	-0.373***
	(0.046)	(0.063)	(0.058)	(0.065)
Belongs to graduate school	0.273***	0.786***	-0.004	0.329**
	(0.091)	(0.068)	(0.188)	(0.141)
Year=2007	-0.040***	-0.055**	-0.014	0.070***
	(0.014)	(0.022)	(0.015)	(0.022)
Year=2010	-0.135***	-0.166***	-0.068***	-0.044
	(0.017)	(0.024)	(0.024)	(0.030)
Year=2013	-0.218***	-0.248***	-0.126***	-0.095***
	(0.021)	(0.026)	(0.030)	(0.033)
University fixed effects	Yes	Yes	Yes	Yes
Observations	90,518	54,824	60,027	120,732

Inside brackets are robust standard errors. *,**,***= significant at the 10%, 5%, and 1% levels. Public universities are: national, prefectural and city universities. Humanities related includes: Humanities, Education and Art. STEM includes: Sciences, Engineering and Agriculture.

Figure 5: Histogram of the department level shares of female faculty: All fields

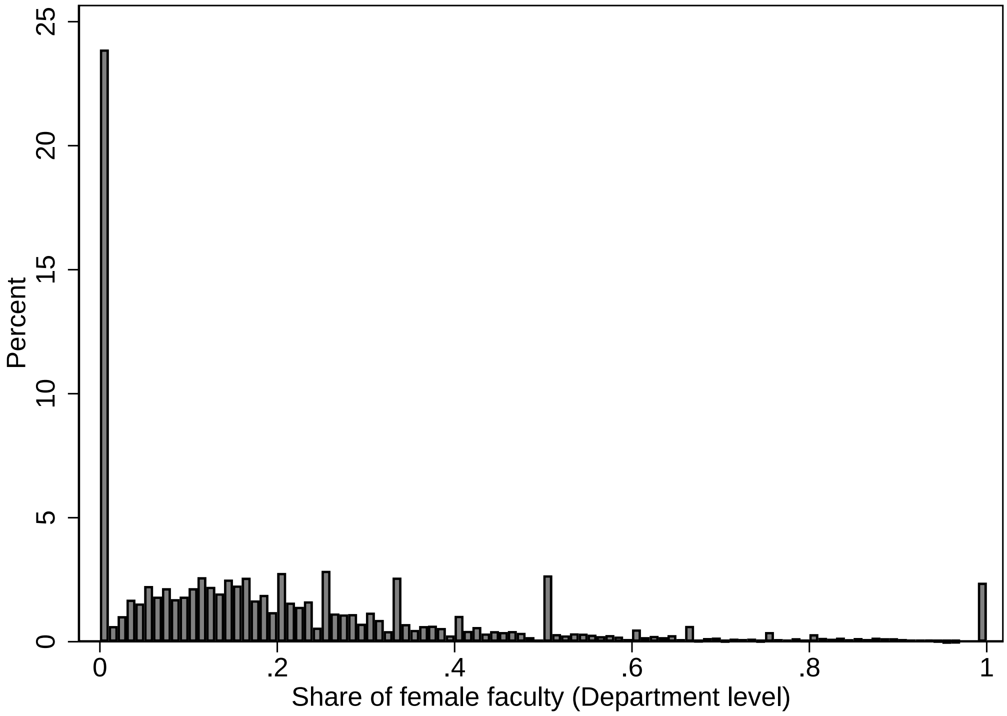


Figure 6: Histogram of the department level shares of female faculty: STEM fields

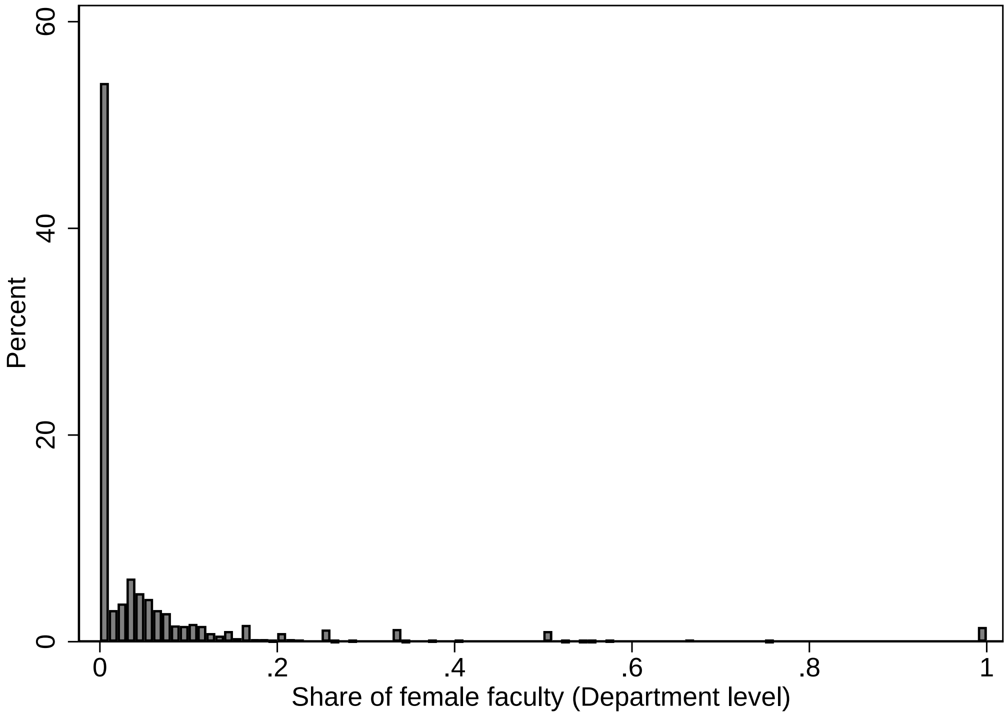


Table 5: The two grants and the promotion Gap (OLS): All fields

	All universities		National & Local public univ.	Private univ.
Variables	Model 1 Dept var= Rank modified	Model 2 Dept var= Above Assist prof	Model 3 Dept var= Above Assist prof	Model 4 Dept var= Above Assist prof
α_1:Female×Year 2004	-0.147***	-0.011**	-0.013	-0.013**
	(0.011)	(0.005)	(0.008)	(0.006)
α_2:Female×Year 2007	-0.140***	-0.014***	-0.003	-0.023***
	(0.009)	(0.004)	(0.007)	(0.005)
α_3:Female×Year 2010	-0.154***	-0.029***	-0.014*	-0.038***
	(0.009)	(0.004)	(0.008)	(0.004)
α_4:Female×Year 2013	-0.162***	-0.039***	-0.019**	-0.049***
	(0.009)	(0.004)	(0.008)	(0.004)
β_1:Ever received Supp.Grant only*Female	-0.021	-0.036***	-0.038**	-0.037**
	(0.024)	(0.011)	(0.016)	(0.015)
β_2:Ever received Supp.&Acell.Grant×Female	-0.138***	-0.092***	-0.086***	
	(0.033)	(0.015)	(0.016)	
γ_1:Support Grant only×Female	0.001	-0.001	-0.011	0.001
	(0.019)	(0.008)	(0.010)	(0.012)
γ_2:Support&Acceleration Grant× Female	0.045**	0.021**	0.005	
	(0.021)	(0.010)	(0.013)	
Age	0.054***	0.104***	0.097***	0.106***
	(0.009)	(0.002)	(0.003)	(0.003)
Age squared	0.016*	-0.092***	-0.082***	-0.095***
	(0.009)	(0.002)	(0.003)	(0.003)
Academic experience	0.041***	0.013***	0.021***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)
Academic experience squared	-0.111***	-0.032***	-0.055***	-0.016***
	(0.004)	(0.003)	(0.004)	(0.003)
PhD from Japan	0.199***	0.107***	0.098***	0.122***
(Excluded=BA&below from Japan)	(0.011)	(0.005)	(0.006)	(0.006)
MA Japan	0.135***	0.076***	0.075***	0.070***
	(0.012)	(0.005)	(0.007)	(0.006)
Final degree abroad	0.086***	0.107***	0.121***	0.106***
	(0.018)	(0.007)	(0.014)	(0.007)
Alma mater BA&graduate level	-0.186***	-0.082***	-0.067***	-0.096***
	(0.021)	(0.009)	(0.013)	(0.011)
Alma mater graduate level	-0.228***	-0.099***	-0.096***	-0.086***
	(0.014)	(0.007)	(0.008)	(0.010)
Belongs to graduate school	0.107***	0.023**	0.021*	0.019**
	(0.015)	(0.011)	(0.011)	(0.010)
Constant	-2.924***	-2.038***	-1.978***	-2.018***
	(0.200)	(0.050)	(0.071)	(0.068)
Year dummies	Yes	Yes	Yes	Yes
Field dummies	Yes	Yes	Yes	Yes
University fixed effects	Yes	Yes	Yes	Yes
R-squared	0.586	0.424	0.420	0.444
Observations	620,849	620,849	289,150	331,699

Inside brackets are robust standard errors. *,**,***= significant at the 10%, 5%, and 1% levels. Model 1 uses Probit Adapted OLS and Model 2-4 uses a linear probability model.

Table 6: The two grant and the promotion gap (OLS): STEM fields

Variables	All univ. Model 1 Dept var= Above Assist prof	Public Model 2 Dept var= Above Assist prof	Private Model 3 Dept var= Above Assist prof
α_1:Female×Year 2004	-0.053***	-0.114***	-0.056***
	(0.014)	(0.026)	(0.015)
α_2:Female×Year 2007	-0.039***	-0.076***	-0.047***
	(0.011)	(0.021)	(0.013)
α_3:Female×Year 2010	-0.040***	-0.050**	-0.065***
	(0.011)	(0.020)	(0.010)
α_4:Female×Year 2013	-0.044***	-0.050***	-0.066***
	(0.010)	(0.018)	(0.011)
β_1:Ever received Supp. Grant only×Female	-0.076***	-0.034	-0.084**
	(0.021)	(0.028)	(0.036)
β_2:Ever received Supp.&Accel. Grant×Female	-0.123***	-0.036	
	(0.024)	(0.031)	
γ_1:Support Grant only×Female	0.011	-0.041**	0.075**
	(0.018)	(0.020)	(0.036)
γ_2:Support&Acceleration Grant×Female	0.045*	-0.020	
	(0.027)	(0.321)	
Age	0.142***	0.147***	0.125***
	(0.002)	(0.002)	(0.006)
Age squared	-0.130***	-0.133***	-0.116***
	(0.002)	(0.003)	(0.006)
Academic experience	0.005***	0.005***	0.003**
	(0.001)	(0.001)	(0.001)
Academic experience squared	-0.012***	-0.016***	-0.008**
	(0.003)	(0.004)	(0.003)
PhD from Japan	0.165***	0.194***	0.128***
(Excluded=BA&below from Japan)	(0.018)	(0.025)	(0.019)
MA Japan	0.135***	0.171***	0.077***
	(0.017)	(0.024)	(0.015)
Final degree abroad	0.157***	0.204***	0.093***
	(0.025)	(0.036)	(0.021)
Alma mater BA&graduate level	-0.032**	-0.024	-0.064***
	(0.014)	(0.017)	(0.014)
Alma mater graduate level	-0.076***	-0.073***	-0.081***
	(0.010)	(0.012)	(0.016)
Belongs to graduate school	0.012	0.011	-0.024
	(0.010)	(0.010)	(0.043)
Constant	-3.028***	-3.277***	-2.427***
	(0.065)	(0.049)	(0.148)
Year dummies	Yes	Yes	Yes
Field dummies	Yes	Yes	Yes
University fixed effects	Yes	Yes	Yes
R-squared	0.384	0.388	0.407
Observations	177,345	117,318	60,027

Inside brackets are robust standard errors. *,**,***= significant at the 10%, 5%, and 1% levels.

Table 7: The impact of grants on female share: Dept var=Department level female share (OLS)

	Model 1	Model 2	Model 3
Variables	All fields	All fields	STEM only
$\overline{Age}_{jkt}/10$	0.135	0.152	-0.124
	(0.096)	(0.099)	(0.196)
$(\overline{Age}_{jkt}/10)^2$	-0.020**	-0.021**	0.006
	(0.010)	(0.010)	(0.020)
$\overline{Academic\ experience}_{jkt}/10$	0.004	-0.017	0.007
	(0.019)	(0.020)	(0.070)
$(\overline{Academic\ experience}_{jkt}/10)^2$	-0.003	0.002	0.008
	(0.006)	(0.006)	(0.018)
$\overline{PhDfromJapan}_{jkt}$	-0.030	-0.036	-0.160*
(Excluded BA&below from Japan)	(0.024)	(0.023)	(0.090)
$\overline{Master\ from\ Japan}_{jkt}$	-0.006	-0.008	-0.154*
	(0.026)	(0.025)	(0.084)
$\overline{Final\ degree\ abroad}_{jkt}$	0.047	0.053	0.313
	(0.038)	(0.039)	(0.284)
$\overline{Alma\ mater\ BA\&graduate\ level}_{jkt}$	0.004	0.003	-0.062
	(0.024)	(0.022)	(0.048)
$\overline{Alma\ mater\ graduate\ level}_{jkt}$	0.058***	0.053***	0.018
	(0.020)	(0.020)	(0.039)
Have *Support Grant* only	-0.003	-0.008	-0.006
	(0.006)	(0.009)	(0.020)
Have *Support & Acceleration Grant*	0.006	-0.009	-0.026
	(0.011)	(0.016)	(0.038)
Constant	0.015	-0.038	0.593
	(0.236)	(0.243)	(0.437)
Field dummies included	Yes	Yes	Yes
Department level fixed effect	Yes	Yes	Yes
University specific time trend	No	Yes	Yes
R-squared	0.063	0.204	0.213
Observations	15,361	15,361	2,027

The over-bar indicates that the variable is the department level average. Inside brackets are robust standard errors. *,**,***= significant at the 10%, 5%, and 1% levels.