

Stagnation and Persistent Inequality in University Education in Japan Owing to Market-Based Policies

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While the advancement rate to university is rising in many industrialized countries, in Japan it is stagnating. In 2009, it exceeded 50%, implying that Japan had transitioned to a universal phase of attending university (Trow 2006). However, it remains 52% in 2016. On the other hand, historically, two-year junior colleges in Japan have specialized in women's higher education (Ishida 2007). Since the 18-year-old population peaked in 1992, the number of high school graduates decreased owing to a low fertility rate. As a result, the competition in university entrance examinations has relaxed, and a considerable number of two-year junior colleges have been converted to four-year universities to attract high school graduates. Hence, the advancement rate to junior colleges, which exceeded 10% in 1999, is less than 5% in 2016. In addition to universities and junior colleges, there are specialized vocational training colleges (*Semmon Gakko*) in the Japanese post-secondary educational system that typically provide vocational education for two years after high school graduation. The advancement rate to specialized training colleges remains unchanged at about 20% since the 2000s.

The birth rate continues to decline in Japan along with an increasingly aging society. As of 2016, there were 777 universities in Japan, of which 600 were private. 73.5% of all university students are affiliated to private universities. Since the primary financial sources of private

universities are tuition fees and they cannot expect the government to increase their subsidies, they must attract a certain number of students. Considering this condition, the advancement rate should increase as university entrance examinations become easier.

In the Japanese educational system, once a student graduates from high school, they can matriculate at a university. However, since each university has examinations or an original admission system, high school students apply to the universities that they want to enter the year before they expect to graduate from high school. Universities usually select students for admission on the basis of examination scores, recommendations from the high school, and an evaluation interview. However, as mentioned above, universities seem to fail to attract high school graduates. In spite of relaxing the competition in entrance examinations, only half of high school graduates progress to universities. There are some universities that receive so few applications that they have no choice but to admit student with low scores.

Why has the advancement rate to university stagnated? It is probable that rising tuition fees have been an influential factor in the stagnant advancement rate. If a student wants to enter university, they can easily do so by passing entrance examinations. However, certain students chose not to pursue university education. If the private monetary cost to attend university is high, the decision on whether or not they enroll depends greatly on their evaluation of a university education. Thus, inequality in access to university based on socioeconomic backgrounds may still persist or be expanding.

On the other hand, although the advancement rate to university has remained stable recently,

there has been a gradual increase since the new American-style education system was introduced after the World War II. If the inequality of access to higher education decreased due to educational expansion, a qualitative difference in attending university may be reflected in the socioeconomic backgrounds of students (Lucas 2001; 2017). In spite of a decreasing 18-year-old population due to a low fertility rate, the entrance examinations for selective (prestigious) universities remain competitive. Under this social condition, selective universities may place greater importance on academic grades, and may attempt to maintain their social status by acquiring more promising students. If this is true, students from high socioeconomic backgrounds may have an advantage in passing the entrance examinations given by selective universities, because they can afford to pay for private tutoring in preparation for the examination (Alon 2009). Thus, as higher education expands, the qualitative difference among universities, for example, prestigious or non-prestigious universities, may influence admission. This paper investigates the qualitative differences in student populations and universities based on nationwide survey data in Japan.

A Brief History of the Japanese Higher Education System

Figure 1 shows the changes of advancement rate to university and junior college by gender. Tertiary educational institutions in Japan have been strongly gender-segregated in response to the labor market. Until the enactment of Equal Employment Opportunity Law in 1986, women were not employed as regular full-time workers, except as a few professionals and public office workers, regardless of educational background. Most female workers engaged in subordinate jobs, and they

were expected to leave the workplace when they got married. Under this condition, it was rational for women who wanted to be employed by large companies to attend junior colleges, a trend that continued until the beginning of the 1990s.

(Figure 1 here)

Although gender segregation in the labor market remains, it has blurred gradually. The perception of gender roles is changing, and employers seek promising young workers regardless of gender due to globalized competition and decreasing number of young adults. These changes in the workforce have resulted in fewer challenges for women to progress to universities. In addition, the decreasing number of high school graduates, resulting in less competition in entrance examinations, spurs the increasing advancement rate of university for women although women's advancement remains less than that of men.

Figure 2 indicates the changes in the number of universities in Japan. A public university is defined here as a university managed by the local government. After World War II, the number of national and public universities remained stable while the number of private universities rapidly increased. While national and public universities are managed by public expenditure, private universities rely on tuition fees. After World War II, as the Japanese economy improved, the average income increased. It became difficult to manage private universities without raising tuition fees. Private universities insisted that the competition for collecting applicants was unfair because the difference in tuition fees between national/public and private universities was considerable. In addition, private universities asserted that the government should support them financially because

private universities also provided education and played a public role in society.

(Figure 2 here) (Figure 3 here)

In 1975, the Act on Subsidies for Private Schools was enacted, granting government subsidies to private universities. However, since the government financial subsidies were strict, the tuition fees for national/public universities started increasing rapidly from the 1970s (see Figure 3). In the 1980s, neoliberal reforms were introduced in every sector, and the government promoted the privatization of the public sector in order to decrease public expenditure. It was argued that, while education has positive externalities, all high school graduates do not progress to tertiary educational institutions. In addition, since university graduates can obtain future private benefits from their educational background, it was concluded that they should pay certain tuition fees for tertiary education. Thus, tuition fees increased even further (Nakazawa 2016).

Originally, the Japanese educational system was regarded as standardized, uniform, and less stratified. However, since the 1990s, market-based policies that encourage competition, such as school choice, ability grouping instruction, and multiple tracks in secondary education, have been introduced. These educational reforms are consistent with trends in the United States and other English-speaking countries, which a Finnish educational researcher, Pasi Sahlberg, has called the Global Education Reform Movement (GERM) (Sahlberg 2006; 2016). In addition, students from high socioeconomic backgrounds and their parents in urban areas were often dissatisfied with public school education, labeling it as too unified and sub-standard. They chose private schools, because they believed that the standard of private school education seemed to be higher and led to advantages

in passing entrance examinations (Kariya and Rosenbaum 1999).

Adamson and Åstrand (2016) suggested a simple framework for understanding educational policies from an international comparative perspective. National educational systems consist of three key elements: policy drivers, economic rationales, and education mechanisms. While most English-speaking and Latin American countries pursue privatized market-based educational reforms, several countries, such as Finland, Canada, and Cuba, value public investment in education differently. This framework enables us to understand the contrast in educational policies.

There are two contrasting political resolutions used to address difficult social issues in modern industrialized nations. While neoliberal policy drivers pursue privatization, deregulation, and decentralization, public investment policy drivers seek public ownership, public responsibility, and equity. These drivers affect economic rationales and approaches. For example, the neoliberal economic rationale requires efficiency through competition based on consumer choice and scarcity of financial resources. On the other hand, public investment economic rationale values universal access determined by political responsibility and democracy. Policy drivers and economic rationales also affect educational mechanisms. Under neoliberal regimes, school choice, vouchers, market-based teaching, and test-based accountability are introduced to educational policies. Under public investment regimes, equitable funding of schools, well-trained teachers, high quality infrastructures, and whole-child curriculums are introduced (Adamson and Åstrand, 2016).

Facing an aging society, expenditures on social security and welfare programs are increasing. Owing to the bad economic condition and people's displeasure with consumption tax increases, the

Japanese government faces financial difficulties. This economic condition makes it difficult for universities to request that the government increase education subsidies. As a result, all national universities and most public (local government) universities were placed under independent administrative institutions in 2004. Since then, the government has decreased subsidies for national/public universities every year, and the financial stability of national/public universities has worsened rapidly. This is the outcome of neoliberal policy drivers and economic rationales. To obtain financial resources, national/public universities must apply for competitive funds, and increasing miscellaneous tasks for these competitive funds hinder research activities.

In spite of this difficult condition, universities, especially prestigious universities, are globally competitive. The University of Tokyo and Kyoto University are highly ranked among Asian countries, being competitive with several universities in China, Singapore, Hong Kong, and South Korea over the past few years. The Ministry of Education has suggested that national universities should reorganize the humanities and social science departments in faculties of education, because the demand for teachers will decline with a decreasing number of students. However, this suggestion has been misunderstood as an attempt to abolish or reduce education in the humanities and social sciences (Yoshimi 2016)¹. This misunderstanding complements the fact that, generally, it is difficult for researchers in the humanities and social sciences to obtain competitive grants because their research is not regarded as immediately useful.

Despite the increasing cost and difficulty in obtaining funding, there have been no resolutions offered to improve the finances of universities. Moreover, the government has not prepared a public

financial support system for disadvantaged students. Originally, there was an educational loan system provided by the government, however scholarships or grants for supporting students from disadvantaged socioeconomic backgrounds are quite few (Ouchi 2015)². Since the household income has stagnated over the last twenty years, the burden of university on a household seems to be severe, and inequality in access to university has persisted.

Literature on the Inequality of Higher Education

Educational inequality has been one of the main topics in social stratification research, and international comparative analyses have been conducted repeatedly. Generally, the younger one is, the more likely he/she is to attend university. This implies that the number of students who progress to higher education can increase regardless of social classes. Gaps in advancement rate between social classes persist and have different meanings depending on the overall advancement rate. Mare (1980; 1981) suggested a transition model using logistical regression analysis in order to examine the net effect of social origins on educational choices, even if the education system had expanded. Having an important impact on international comparative analysis in social stratification research, the framework of Shavit and Blossfeld (1993) was based on Mare (1980; 1981) and concluded that inequality of educational attainment persisted regardless of educational expansion.

However, a reduction in educational inequality has been reported as the education system expanded (Breen et al. 2009). Why did this discrepancy occur? According to Breen et al. (2009), the sample sizes of previous studies were relatively small, and no significant change may have been

detected. In addition, since the average age at which individuals first married increased owing to modernization and educational expansion, the number of children per couple decreased. The governments of industrialized countries improved welfare programs and provided social support for child rearing and education. These conditions enabled people to spend more on educating one child, reducing the impact of social origins on education.

Certainly, late marriages and declining birthrate are applicable to the study of education in Japan. However, while Breen et al. (2009) examined European countries where social welfare programs have been improved, East Asian countries, such as Japan and Korea, provide relatively fragile public support, especially for education. For example, Korea and Japan have the highest share of private expenditure on tertiary educational institutions among the Organisation for Economic Co-operation and Development (OECD) countries (OECD 2016: 210).

Originally, the Japanese believed that parents should pay tuition fees for their children's tertiary education. If their children choose to attend public schools, primary and secondary education was free or inexpensive³. However, traditionally, universities admitted students on the basis of knowledge-based written tests that judged the degree of understanding of the high school curriculum. To ensure entrance to a desired university, many students received informal private supplementary education after regular formal school to prepare for entrance examinations, requiring additional cost (Park 2013; Stevenson and Baker 1992). Therefore, students with high socioeconomic backgrounds have an advantage in preparing for supplementary education.

On the other hand, admission system of universities in Japan is not simple. As the

advancement rate to university increased, universities diversified the admission system. In the 1960s and 1970s, the admission system became a serious social issue because the competitiveness of examinations badly influenced high school education. It was often said that students were exhausted from preparing for examinations, so they did not study rigorously after entering university. Thus, several universities introduced a new admission system that required recommendation letters from high schools and an interview of applicants and did not impose a written examination.

Since many high school students, valuing written tests, regard this recommendation system as unfair, the prestigious universities did not introduce it (Nakamura 2011: 77-95), even though the recommendation system has become common. In addition, the Admission Office (AO) system has been introduced that does not require a recommendation by the high school principal, but applicants submit an essay, are interviewed intensively, take a basic written test, and submit their high school grades. Figure 4 indicates the changes in rates of admitting university students by admission system. Close to 50% of students now, enter the university without taking traditional written tests.

(Figure 4 here)

While the admission by written test uses a single criterion, the recommendation and the AO system are often criticized as ambiguous. Even if students have few cultural capitals, many people believe that they can overcome the disadvantage because the knowledge acquired in school is relatively class-free and neutral. However, interview, essay, and records of club or social activities included in the recommendation letter easily reflect class distinctions, language, and habitus (Bourdieu 1989). In addition, as the admission system diversified, collecting information regarding

university admissions may determine educational choices. Generally, students and parents from high socioeconomic backgrounds tend to have developed skills in collecting information (Lareau 2011). This implies that the recommendation system and the AO system may contribute to admission of students from advantageous backgrounds.

Hypotheses

When the impact of educational policies in higher education on people's educational attainment are examined, the specific context of Japan needs to be considered: gender segregation of tertiary education, relaxing competition for admission since the 1990s owing to declining fertility rate, and fragile public support system for students from less advantageous socioeconomic backgrounds.

Since the advancement rate to university is not saturated, the inequality in access to university does not disappear. In addition, although the substantial household income has not increased over the last twenty years, tuition fees continue to rise. The level of income poverty, or the people who live on less than half median incomes in Japan is above the OECD average⁴, and the poverty rate of households with children has also increased since the 1990s (Abe 2008).

In addition, while prestigious universities and national/public universities tend to adopt a simple written high-stakes test in admission, other private universities tend to rely on the recommendation or AO admission system, although there are exceptions. However, it may be difficult for students to prepare for the recommendation or the AO admission system, as they seem to be too complex to understand and the criteria for admission seem to be ambiguous. Generally,

students admitted through the new systems are less likely to study as hard as high school students, because they do not need to take difficult written examinations. Thus, while the high-stakes test directly depends on academic grades, the new admission systems may be influenced by the students' or their parents' value to the university. Consequently, even if it may be easier to gain admittance to a non-selective university, a class-based gap between students who attend university and those who do not remains. Considering this, it is hypothesized that since there may be a class-based barrier that determines whether a student can attend university, inequality in access to university still persists and may be expanding.

Students usually regard the high-stakes written test as difficult, tending to devote time and energy studying for their examination. Since they believe that the examination level is beyond the formal school curriculum, they often go to supplementary informal private schools or learn by correspondence (mail), requiring additional costs. Thus, as university education expands, a qualitative difference between selective and non-selective universities may appear. It is hypothesized that inequality in access to university would replace inequality in access to selective universities, or that while inequality in access to university declines, inequality in access to prestigious universities would remain stable.

Historically, men's educational expansion began earlier than that of women. Thus, the advancement rate of men to university is higher than that of women. The advancement rate of women to university remained low until the beginning of the 1990s and increased rapidly since then. Thus, it is hypothesized that the qualitative difference among universities (prestigious or

non-prestigious universities) based on social origin appeared only among men, because the number of female university graduates remains small. This may pose a different question for women: whether to go to university rather than which university to attend.

Data and Variables

In this paper, the Social Stratification and Social Mobility (SSM) survey data conducted in 2015 is used for analysis⁵. The SSM project began in 1955 and the project surveyed occupation, education, parental education and occupation, and other socioeconomic background information for each decade. Respondents aged from 20 to 80 at the end of 2014 were randomly sampled nationwide, totaling 7,817 individuals. This paper includes the 7,808 individuals (men, 3,568; women, 4,240) for whom there were no missing variables.

In order to compare the degree of social origin effects on educational attainment, the samples were classified into three birth cohorts based on the changes of university tuition fees and the advancement rate to university (Figure 1 and 3). The first group was born between 1935 and 1953. Universities changed from elite to mass higher educational institutions (Trow 2006) when people of this generation graduated from high school, and the advancement rate to university increased as Japan's economy grew rapidly. During this period, while the tuition fees of private universities gradually increased, those of national universities remained low and stable. The second group was born between 1954 and 1971. When this generation graduated from high school, the advancement rate to university stagnated, because the Ministry of Education strictly controlled the establishment

of new universities due to a decreasing number of future 18-year-olds. In the 1980s, the university advancement rate of men decreased due to the increasing number of 18-year-olds and increasing women's aspiration. Severe competition in entrance examinations was a prominent social issue. Tuition fees of both (public/private) types of universities increased simultaneously during this period. The last group was born between 1972 and 1994. The number of 18-year-olds peaked in 1992 and then decreased rapidly, causing admission to be less competitive from the latter half of the 1990s. The advancement rate to universities began to increase. On the other hand, Japan's economy has been in a long recession, causing income gaps and inequality to become a social issue in Japan from the 2000s (Otake 2005; Sato 2000). In this period, Japan's economy faced severe conditions. While workers' salary did not increase, tuition fees continued rising. Thus, the relative private burden on university education actually escalated.

This paper focuses on the respondent's educational attainment, which was classified into five categories (Table 1). With regard to universities, selective universities were distinguished from (general) universities. Selective universities (Table 2) were defined based on their history, difficulty in admission, and classification often used among Japanese.

(Table 1) (Table 2)

Concerning social origins, parents' educational background and father's occupational class were considered. Parents' educational background was classified into the following three categories: both father and mother did not have higher (university and junior college) education, either father or mother had higher education, and both father and mother had higher education. Father's occupation

was classified into six categories based on the Erikson-Goldthorpe-Portocarero (EGP) class scheme (Erikson et al. 1979). If there was no father, or the respondent did not know their father's occupation, these individuals were included in the category "no father, no job, or no answer" in Table 1.

According to Table 1, while the percentage of those attending prestigious universities remained relatively similar in these three groups, the percentage attending general universities gradually increased in the younger cohort. The respondents' educational attainment did not only go up, but parents' education also expanded. In addition, the EGP categories IV+VIIb (self-employed or farmer) rapidly decreased owing to economic growth and radical changes in the industrial structure.

Methods

First, the binary logistic regression model on the choice to progress to university and to progress to prestigious universities was estimated. In this analysis, the individuals who completed secondary education were included, which implies that those who only completed compulsory education were excluded from these logistic regression models, because university applicants are required to graduate from high school. This logistic regression model includes the dummy variables of birth cohort, parental education, and father's occupational class. In order to examine the impact of these parameters, the interaction between cohort and parental education, or between cohort and father's occupation, were included.

This logistic regression model follows Mare's transition model (Mare 1980; 1981). However, if these models are compared among different cohorts, one serious problem appears. This transition

model's target was high school graduates. Among younger generations, most people graduated from high schools owing to educational expansion. However, among older generations, those who could progress to high school were also selected. Therefore, unobserved factors might affect the advancement to high school among older generations, implying that there may be selection bias toward high school graduates in the older generations (Lucas 2017). In addition, this binary logistic regression model cannot compare the effect of universities or other post-secondary educational institutions, such as specialized training colleges or junior colleges.

If educational attainment can be understood as a nominal category, a multinomial regression model could be used assuming the irrelevant independence of alternatives (IIA) (Powers and Xie 2000: 245-247)⁶. However, educational categories seem to be regarded as independent alternatives. The category of “junior high school or high school” can be applicable to all, but high school graduates diverge into three streams of post-secondary educational institutions if they progress to higher educational institutions: specialized training colleges, junior colleges, or universities. In other words, while there is a single track until secondary education, there are three courses for tertiary education (Breen and Jonsson 2000).

It is possible to consider the educational category as ordered on the basis of social prestige or estimation. Educational attainments were coded as 1=junior high or high school, 2=specialized training college, 3=junior college or technical college, 4=general university, and 5=prestigious university. Then, ordered logit models were used when educational attainment was taken as an ordinal dependent variable. However, ordered logit models assume proportional odds or parallel

lines that imply that the coefficients of a given independent variable are the same regardless of the threshold level of the dependent variable. In this case, five categories were defined, and the ordered logit model was equivalent to a series of binary logistic regression models where categories of dependent variables were combined. For example, category 1 was contrasted with categories 2, 3, 4, and 5. Categories 1 and 2 were contrasted with categories 3, 4, and 5, etc. This series of binary logistic regression models had the same coefficients at given independent variables. This is a strong assumption and should be verified often (Williams 2006).

Williams (2006) suggested that the proportional odds assumption can be partially relaxed, and if possible, this model be regarded as more parsimonious than multinomial regression models. The Stata command, “gologit2,” was used to estimate this partial (generalized) proportional odds model. First, the simple ordered regression model was estimated, and second, the proportional odds ratio assumption was relaxed partially. In addition, the interaction between cohorts and other independent variables, such as parental education and father’s occupation, were included. If the model improved, the model with interaction terms was chosen.

Results

Model Selection

Table 3 shows the model selection criteria of the binary logistic regression predicting respondents’ attendance of university or selective university. These models consist of birth cohort, parental education, and father’s occupation. The interaction terms between cohort and parental

education (model 2), or the interaction terms between cohort and father's occupation were added (model 3). All patterns have the smallest Bayesian Information Criterion (BIC) in model (1), which does not have interaction terms. However, considering the chi square value of the likelihood ratio test, men's model (3), which included the interaction between cohort and father's education, can be regarded as having improved model fit. Except for men's attendance of university, there was no change in the effects of parental education and father's occupational class.

(Table 3)

Table 4 indicates that the BIC scores were the lowest in model (2), which relaxed the proportional odds assumption of cohorts. However, from the viewpoint of likelihood ratio test, men's model (6), which included interactions between cohort and father's occupation and between cohort and parental education, and relaxed the proportional odds ratio assumption of cohort, was the best fit. With regard to women, model (5), which included interactions between cohort and father's occupation and relaxed the proportional odds ratio assumption of cohort and father's occupation, was the best fit. Therefore, I accordingly interpret the models with these interactions.

(Table 4)

Interpretation of the Regression Models

According to Table 5, three models for predicting male selective university attendance and female total/selective university attendance did not have interaction terms with cohorts. This implies that there was no change in attending university or prestigious universities based on social origin.

Those whose parents had higher educational backgrounds, and whose father was a professional, managerial, or non-manual worker, were more likely to attend a university or selective university. These trends did not change with educational expansion.

(Table 5)

However, considering the model predicting male university attendance, the effect of having a father working as a manual worker was significant. In the youngest group, only those with fathers in manual jobs were less likely to attend university than those having fathers in professional or managerial jobs. However, the interaction terms between cohort and father's occupation were also significantly negative, showing that the gaps in attending university between those with professional or managerial fathers and those with other types of fathers were larger among the two older cohorts. These results generally supported the second and third hypotheses I suggested: for men, while inequality in access to university declined, access to selective university persisted. On the other hand, for women, there was inequality in access to university/selective university and the degree of inequality did not alter.

The expansion of higher education occurred earlier for men, and this contributed to decreasing inequality in access to university. However, the expansion only occurred among men and mass universities. Selective universities still provided fewer opportunities for people from disadvantaged socioeconomic backgrounds. Similar results among women could not be found among women, because the rapid expansion in women attending university began only twenty years ago. These binary logistic regression models excluded respondents who did not progress to high school and

could not obtain matriculation. Thus, models for earlier cohorts might affect the estimation of logit models because only selected people could progress to high school, and the target of logit models in earlier cohorts would have similar abilities and characteristics.

Finally, I will present the results of the generalized ordered logit models. However, since these models are too complex to interpret the coefficients, the detailed results of the generalized ordered logit regression model have been omitted. Instead, I calculated the predicted probabilities of attending non-selective/selective universities based on birth cohort and father's occupation.

(Figure 5) (Figure 6) (Figure 7) (Figure 8)

Figures 5 and 6 indicate men's predicted probabilities of attending selective or non-selective university based on model (5) in Table 4, and Figures 7 and 8 show women's predicted probabilities of attending selective or non-selective university based on model (5) in Table 4. When I calculated the predicted probabilities, variables regarding parental education were fixed at mean values.

The results were not contradictory to those of binary logistic regression models. According to Figure 5, predicted probabilities of attending selective university decreased. Although the figure of predicted probabilities of attending specialized training college was omitted, these probabilities increased the probabilities of attending selective university. As the predicted probabilities of attending selective university dropped, the gap between father's occupational classes seemed to decrease. On the other hand, Figure 6 shows the change of predicted probabilities of attending non-selective university, and it seems that the gap based on father's occupation was persistent. While the gaps of men's predicted probabilities for attending selective universities seem to have dropped

rapidly, those of women seems to be stable, particularly between white collar and blue collar fathers.

In detail, men whose fathers were professional or managerial workers had an advantage in progression to selective and non-selective universities. This advantage gradually shrunk in advancement to selective universities. Considering the changes of distribution of father's occupational class (Table 1), their advantage in access to selective universities gradually weakened due to increasing white collar workers and expansion of tertiary education On the other hand, those whose fathers were non-manual workers had a higher advantage in progressing to non-selective universities than those with professional or managerial fathers among the youngest cohort. Those whose fathers were semi or non-skilled workers were more likely to progress to non-selective universities in the younger cohorts. However, altogether, the predicted probabilities for advancement to non-selective universities remained stable between the cohorts born between 1954-71 and 1972-94, and the gap based on father's occupational class seemed to remain stable.

Since the relative rate of selective universities and students affiliated with them might decrease because of the increasing number of universities (see Figure 2), considerable number of these universities were originally established as junior colleges. They foresaw the declining number of 18-year-olds and gender equality society, and expected that junior colleges would become unpopular among high school graduates. Thus, they transformed universities. Since the 1990s, the number of female high school graduates who progressed to 4-year universities actually increased. This might imply that more women started competing to entering universities in the 1990s, so men began to feel that university admission became more competitive.

While women's advancement rate to non-selective universities rapidly increased, the gap of father's occupational class did not shrink, except for the gap between those with professional or managerial fathers and those with self-employed or agricultural fathers. Note that the scale ranges of vertical axes were different between men's figures and women's figures. Compared to men's figures, Figures 7 and 8 emphasized the changes and gaps of predicted probabilities because the ranges of vertical axes were small. In any case, while the women's predicted probabilities of selective universities remained low and unchanged, those of non-selective universities seemed to expand. However, the interactions between cohorts and father's occupational classes were insignificant except those between cohorts and EGP class IV+VIIb.

In summary, from the result of binary logistic regression models, the inequality of educational attainment based on father's occupation seems to be stable, except for attending both selective and non-selective universities. When generalized ordered logit models were considered, altogether the gap based on father's occupational classes did not reduce, except for men's advancement to selective universities. Fujihara and Ishida (2016) reported the stability of social origin effects on educational attainment using the generalized ordered logit model; however, they only used father's education as an indicator of social origin. Although the variables of parental education used here differed from theirs, and this paper considered father's occupational class, this analysis did not improve when the interactions between cohorts and parental education were included. Thus, there was no clear trend of decreasing gap for attending university based on parental education, and this result was not contradictory to the analysis by Fujihara and Ishida (2016).

Conclusion

After World War II, the advancement rate to university in Japan increased, although there was a stagnant period during the 1980s. However, the gender gap in university advancement remains, and the inequality of educational attainment, particularly in advancement to universities or prestigious universities, persists.

Bukodi and Goldthorpe (2013) indicated whether or not the inequality of educational opportunity would change depends on the conceptualization and measurement of social origin. In addition, since most social stratification and mobility researchers use retrospective survey data, they tend to overlook economic indicators, such as household income. However, these economic indicators could have an independent effect on educational attainment (Bukodi and Goldthorpe 2013). According to Fujihara and Ishida (2016), when an absolute value, such as years of schooling, is used as an educational indicator, the inequality of educational opportunity is reduced. On the other hand, when a relative value, such as ranking within the distribution of education, is used as an educational indicator, the inequality of educational opportunity increases. This paper uses not only parental education, but also father's occupation as indicators of social origins, and does not identify any changes in the effects of parental education.

According to the results of binary logistic regression model, inequality in access to general (mass) universities seemed to decline for men, whose advancement to university exceeded 50%, when focusing on father's occupational class. On the other hand, inequality in access to selective

universities did not change. Women's inequality in university education also persisted. An increasing gap of access to university in the youngest cohort was not identified. As mentioned above and Bukodi and Goldthorpe (2013) discuss, household economy was not included, so the impact of increasing tuition fees could not be evaluated directly. This is a limitation of this paper.

According to the generalized ordered logit regressions, regardless of cohorts, the significant effects of parental education and father's occupation on classification of educational levels were observed. Since the model that included the interactions between cohorts and father's occupational class could be regarded as the best fit, the reduction of inequality of educational attainment seemed to be restricted in several fathers' occupational class combinations. Altogether, despite the rapid decrease in the number of 18-year-old population, unequal opportunity in access to universities still remains. Thus, educational expansion due to declining birth rate does not lead to the reduction of educational inequality directly.

Although the recent trend of changes in university admission is referenced, its impact was not examined directly and could be a subject for future research. However, before the university system in Japan transitioned to predominantly mass and universal tertiary institutions (Trow 2006), and before admission systems were diversified and market-based higher education policies were introduced, there was a distinction between general (mass) universities and selective universities on the basis of social origins. This could not demonstrate that the increasing tuition fees and the introduction of marker-based policies in higher education directly affected the people's educational choices because of the lack of data regarding the impact of these factors. However, the reason why

the inequality in educational attainment remained regardless of the decreasing number of applicants should be further examined.

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Notes

- 1) Apart from economics, Japanese scholars of the humanities and social sciences usually publish and present the outcomes of their research in Japanese. This may be regarded as a delay of internationalization in the humanities and social sciences, and may result in lower university rankings.
- 2) If graduates, who obtained this loan while they went to school or college, become educational professionals, such as school teachers, researchers at universities, and professors, the repayment of this loan was remitted. However, this remission system was abolished when the Japan Student Services Organization (JASSO) became an independent administrative institution.
- 3) “Free” means no tuition fees for public primary and junior high schools. Textbooks are distributed

freely in these schools. However, even if children go to public schools, they have to pay actual expenses for school lunches, uniforms, trips, some teaching aids, and a kit for club activities, etc.

4) According to the Comprehensive Survey of Living Conditions conducted by the Ministry of Health, Labor, and Welfare, the relative poverty rate was 16.1% in 2012 in comparison with the OECD average, which was 11%.

5) Data version 070 was used that was distributed among SSM members on February 27, 2017.

6) The IIA assumption was verified using the Stata command “mlogtest, iia,” and found to be violated. Therefore, the multinomial logistic regression model was not used.

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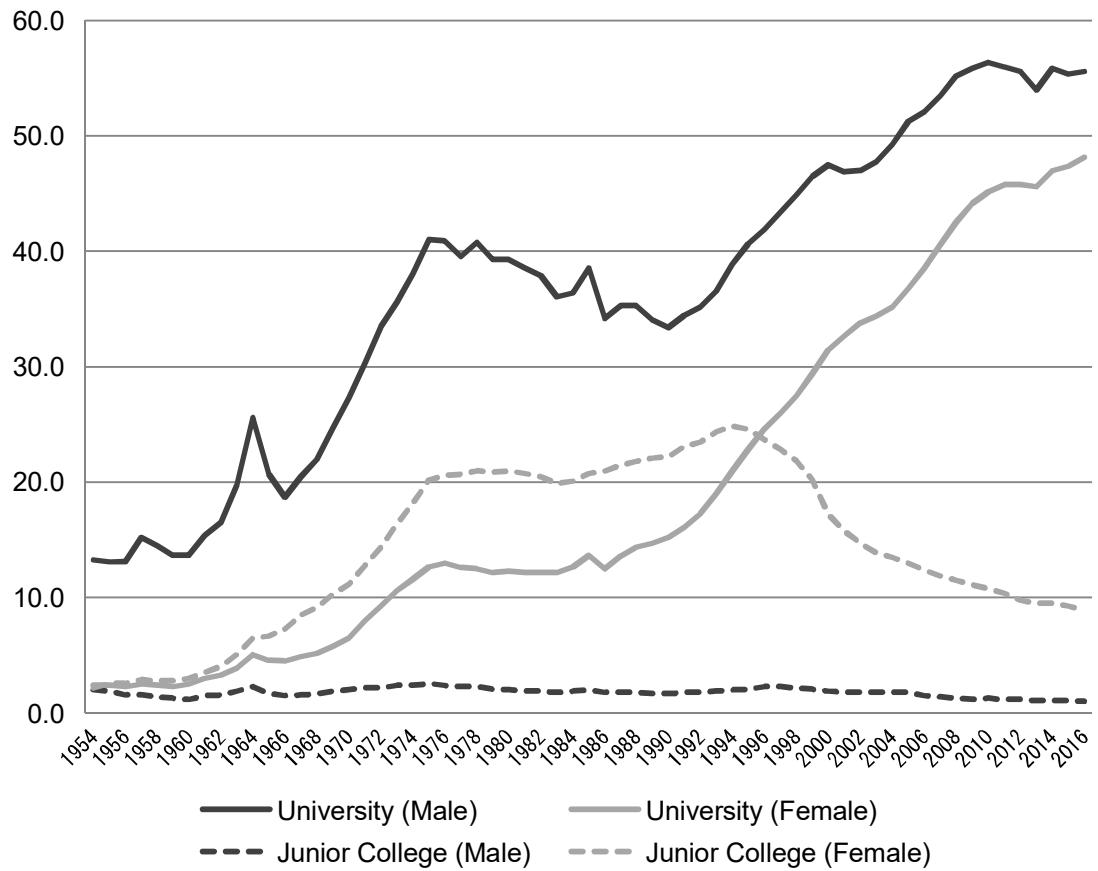
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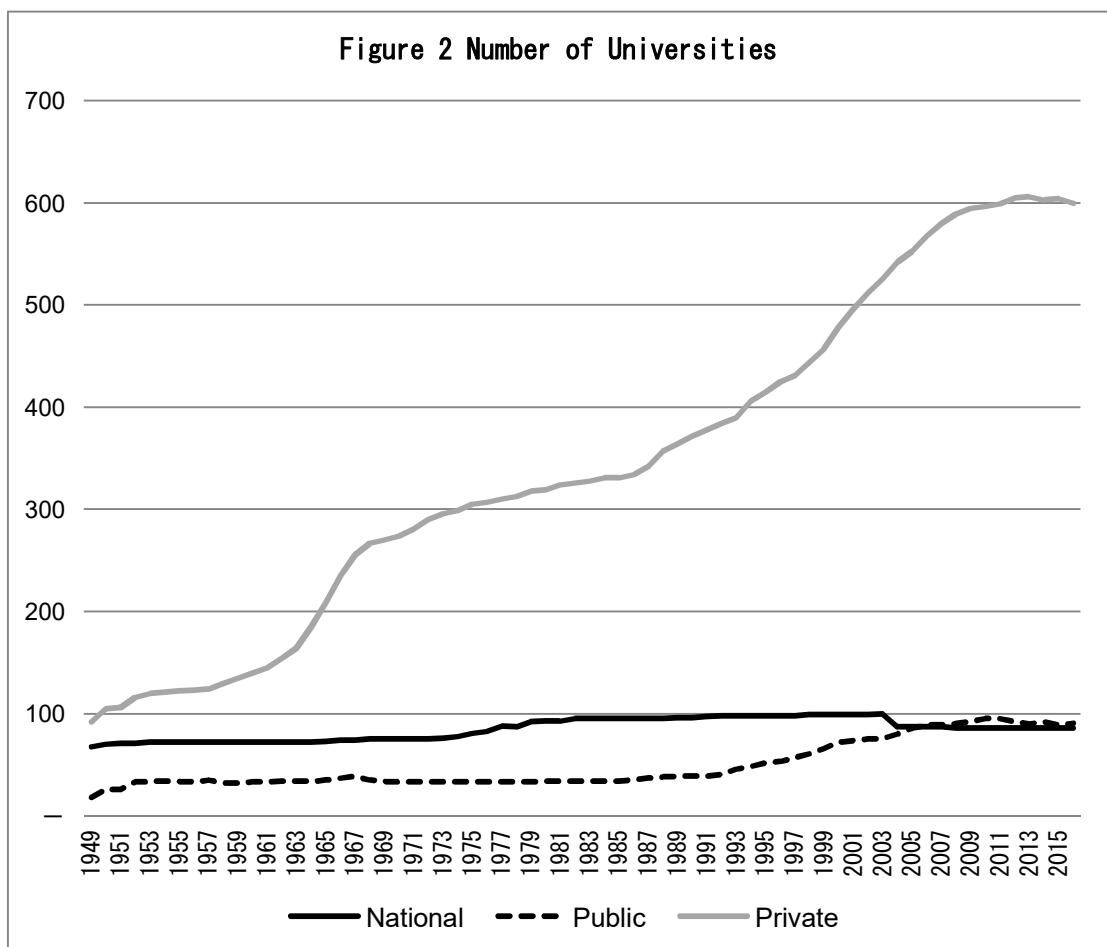
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Figure 1 The Advancement Rate to Tertiary Educational Institution in Japan



Source: Ministry of Education, Culture, Sports, Science and Technology

(<http://www.e-stat.go.jp/SG1/estat>List.do?bid=000001015843&cycode=0>)

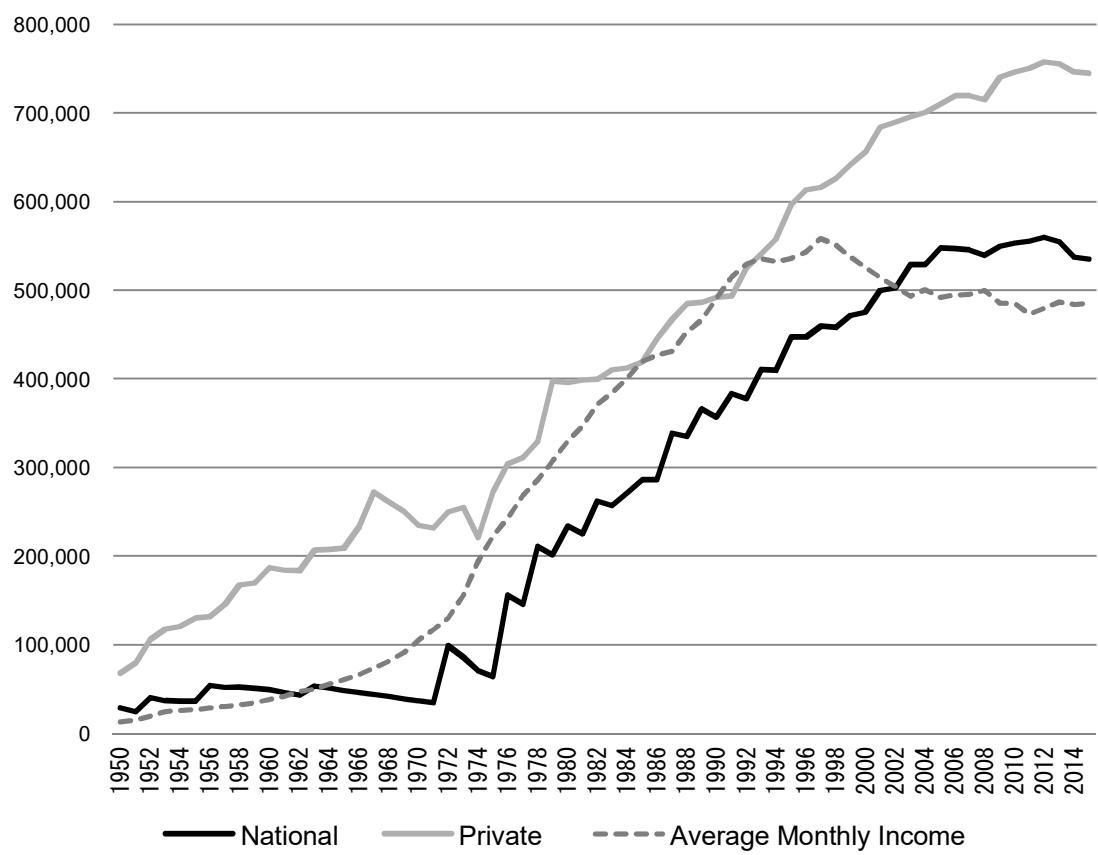


Source: Ministry of Education, Culture, Sports, Science and Technology

(<http://www.e-stat.go.jp/SG1/estat>List.do?bid=000001015843&cycode=0>)

Figure 3 Changes in University Tuition Fees

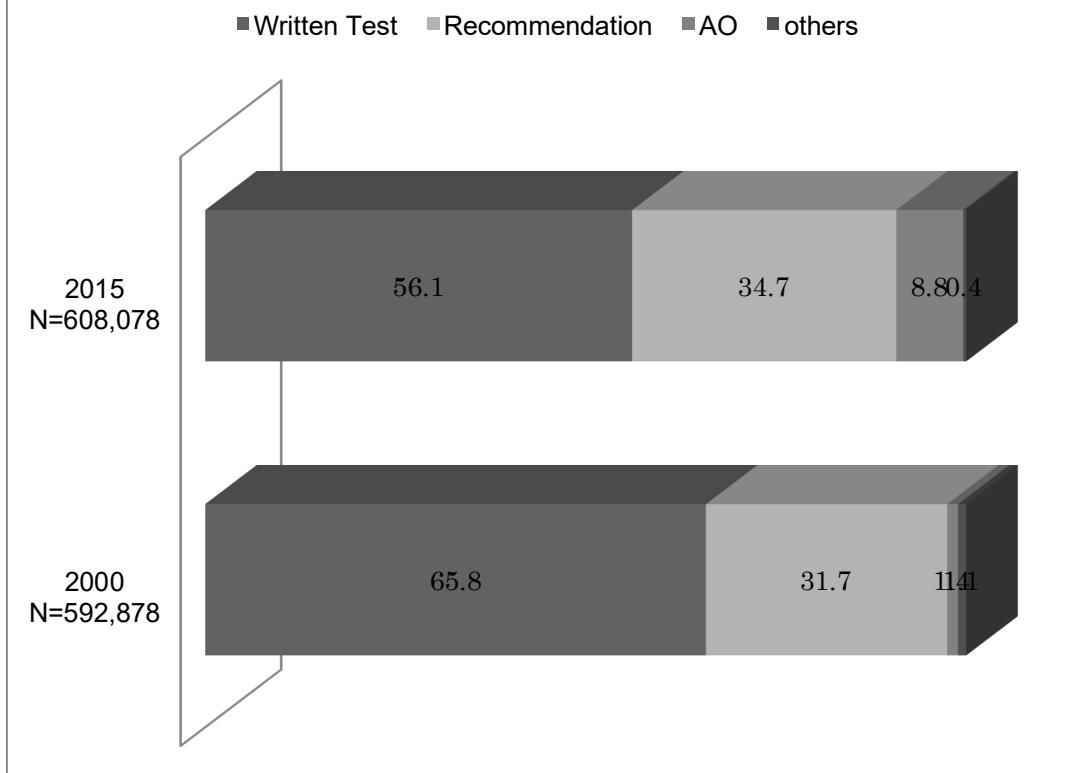
Japanese Yen: Adjusted by the CPI of 2015 base



Sources: Tuition fees and Consumer Price Index (CPI): *Annual Report on the Retail Price Survey*, Statistics Bureau, Ministry of Internal Affairs and Communications. Average income: *Annual Report on Household Income and Expenditure Survey*, Ministry of Internal Affairs and Communications.

Notes: Tuition fees of national universities (average): one year, daytime course, and social sciences and literature. Tuition fees of private universities (average): one year, daytime course, and social sciences and literature. Average Income: monthly wages and salaries per worker's household.

Figure 4 The Rate of University Students by Admission System



Source: Ministry of Education, Culture, Sports, Science and Technology

Table 1 Distribution of Dependent and Independent Variables								
Cohort (N)	Men				Women			
	1972-94 (1,049)	1954-71 (1,058)	1935-53 (1,456)	Sum (3,568)	1972-94 (1,288)	1954-71 (1,355)	1935-53 (1,597)	Sum (4,240)
Educational Background								
Junior High or High School	36.13	47.83	70.19	53.52	35.02	47.75	77.27	55.00
Specialized Training College	17.73	11.34	2.82	9.74	17.47	15.35	9.96	13.96
Junior College	2.38	2.93	1.51	2.19	17.00	20.00	7.58	14.41
General (Non-selective) University	33.56	28.64	15.18	24.59	25.54	14.39	4.07	13.89
Selective University	10.20	9.26	10.30	9.96	4.97	2.51	1.13	2.74
Parents' Education								
Both No Higher Education	61.68	82.42	88.94	78.98	60.17	80.52	90.18	77.98
Either Higher Education	19.83	13.04	9.34	13.53	23.84	15.13	8.20	15.16
Both Higher Education	18.49	4.54	1.72	7.49	15.99	4.35	1.63	6.86
Father's Occupation								
EGP I+II: Professional and Managerial	26.31	19.94	18.27	21.13	25.00	23.32	17.90	21.79
EGP III: Nonmanual	23.55	20.04	16.42	19.59	22.20	21.04	15.33	19.24
EGP V+VI: Manual	13.54	14.27	11.54	12.94	15.61	13.73	10.83	13.20
EGP VIIa: Semi or Nonskilled	18.68	20.60	12.84	16.87	19.18	18.97	13.02	16.79
EGP IV+VIIb: Self-employed or Farmer	4.29	14.36	30.08	17.82	3.27	12.76	30.80	16.67
No Father, No Job, or No Answer	13.63	10.78	10.85	11.65	14.75	10.18	12.14	12.31

Source: SSM 2015

Table 2 Definition of Selective Universities in This Analysis	
National Universities	
The Old Imperial Universities (Kyu Teikoku Daigaku)	Tokyo, Kyoto, Osaka, Hokkaido, Tohoku, Nagoya, Kyushu
The Old National Universities (Kyu Kanritsu Daigaku)	Chiba, Tokyo Institute of Technology, Hitotsubashi, Niigata, Kanazawa, Kobe, Okayama, Hiroshima, Nagasaki, Kumamoto
	All Medical Schools
Other Universities With High Admission Standards	Tsukuba (Tokyo Kyoiku), Ochanomizu, Tokyo University of Foreign Studies, Yokohama National
Prefectural or Municipal Universities	
With High Admission Standards	Tokyo, Osaka, Kyoto, Yokohama City, Osaka City
	All Medical Schools
Private Universities	
Tokyo 6 Universities (except University of Tokyo)	Keio, Waseda, Meiji, Rikkyo, Hosei
Other Universities With High Admission Standards in Tokyo	ICU, Sophia, Aoyama, Chuo, Gakushuin, Tokyo University of Science
Kan-Kan-Do-Ritsu (Prestigious Private Universities in Western Japan)	Kansai, Kwansei-Gakuin, Doshisha, Ritsumeikan

Table 3 Goodness of Fit of Binary Logistic Regression Models

Men: Dependent Variable=University	Log Likelihood	d.f.	Pseudo R ²	BIC	$\Delta-2L^2$	LR Chi2	p
(1)C+E+F	-1835.99	9	.124	3752.445			
(2)C+E+F+CE	-1832.08	13	.126	3776.817 (1)-(2)		7.82	.099
(3)C+E+F+CF	-1817.55	19	.133	3796.005 (1)-(3)		36.86	.000
Men: Dependent Variable>Selective University	Log Likelihood	d.f.	Pseudo R ²	BIC	$\Delta-2L^2$	LR Chi2	p
(1)C+E+F	-1012.40	9	.085	2105.266			
(2)C+E+F+CE	-1008.10	13	.089	2128.864 (1)-(2)		8.59	.072
(3)C+E+F+CF	-1004.88	19	.092	2170.694 (1)-(3)		15.04	.131
Women: Dependent Variable=University	Log Likelihood	d.f.	Pseudo R ²	BIC	$\Delta-2L^2$	LR Chi2	p
(1)C+E+F	-1506.44	9	.161	3094.969			
(2)C+E+F+CE	-1503.93	13	.163	3122.782 (1)-(2)		5.02	.285
(3)C+E+F+CF	-1501.07	19	.164	3166.322 (1)-(3)		10.74	.378
Women: Dependent Variable>Selective University	Log Likelihood	d.f.	Pseudo R ²	BIC	$\Delta-2L^2$	LR Chi2	p
(1)C+E+F	-451.77	9	.123	985.636			
(2)C+E+F+CE	-449.71	13	.127	1014.341 (1)-(2)		4.13	.389
(3)C+E+F+CF	-447.25	18	.125	1049.888 (1)-(3)	*	*	

Notes: * Chi square could not be calculated because several interaction terms and samples were d
C=Birth Cohort, E=Parental Education, F=Father's Occupational Class

Table 4 Goodness of Fit of Generalized Ordered Logit Regression Models

Men	Log Likelihood	d.f.	Pseudo R ²	BIC	$\Delta-2L^2$	LR Chi2	p
(1)C+E+F	-3948.79	9	.091	8003.893			
(2)C+E+F+C τ	-3833.41	15	.118	7822.207 (1)-(2)		230.76	.000
(3)C+E+F+C τ +F τ	-3822.14	30	.121	7922.351 (2)-(3)		22.53	.095
(4)C+E+F+C τ +E τ	-3827.53	21	.119	7859.536 (2)-(4)		11.75	.068
(5)C+E+F+C τ +CF	-3813.50	25	.123	7864.170 (2)-(5)		39.82	.000
(6)C+E+F+C τ +CF+CE	-3809.06	29	.124	7888.001 (5)-(6)		8.88	.064
Women	Log Likelihood	d.f.	Pseudo R ²	BIC	$\Delta-2L^2$	LR Chi2	p
(1)C+E+F	-4651.78	9	.126	9412.141			
(2)C+E+F+C τ	-4639.16	15	.129	9437.008 (1)-(2)		25.25	.000
(3)C+E+F+C τ +F τ	-4621.96	30	.132	9527.902 (2)-(3)		34.39	.003
(4)C+E+F+C τ +F τ +E τ	-4618.86	36	.132	9571.816 (3)-(4)		6.20	.401
(5)C+E+F+C τ +F τ +CF	-4607.41	40	.135	9582.314 (3)-(5)		29.11	.001
(6)C+E+F+C τ +F τ +CF+CE	-4606.19	44	.135	9613.282 (5)-(6)		2.44	.655

Note: C=Birth Cohort, E=Parental Education, F=Father's Occupational Class
 τ =Threshold Parameter Relaxing Proportionality Assumption

Table 5 Coefficients of the Binary Logistic Regression Models Predicting Attendance of University

	Male: University	Male: Prestigious	Female: University	Female: Prestigious
Cohort (base: 1972-94)				
Born 1954-71	.972 *** (.207)	.354 * (.160)	-.471 *** (.104)	-.244 (.230)
Born 1935-63	.828 *** (.193)	.873 *** (.155)	-1.343 *** (.139)	-.501 + (.292)
Parental Education (base: No Higher Education)				
Either Higher Education	.888 *** (.111)	.781 *** (.150)	.829 *** (.110)	1.095 *** (.247)
Both Higher Education	1.919 *** (.175)	1.419 *** (.182)	1.716 *** (.143)	1.927 *** (.260)
Father's Occupation (base: Professional and Managerial)				
Nonmanual	.300 (.192)	-.071 (.147)	-.227 + (.121)	-.191 (.235)
Manual	-.527 * (.237)	-.714 ** (.220)	-.914 *** (.164)	-.861 * (.395)
Semi or Nonskilled	-.260 (.210)	-1.020 *** (.220)	-1.213 *** (.164)	-.954 * (.377)
Self Employed or Farmer	-.475 (.388)	-1.316 *** (.243)	-1.160 *** (.212)	-1.194 * (.540)
No Father, No job, or No Answer	-.111 (.229)	-.775 ** (.223)	-.476 ** (.153)	-.930 * (.390)
Interaction Cohort and Father's Occupation				
Nonmanual*Born 1954-71	-.812 ** (.284)			
Nonmanual*Born 1935-53	-.878 ** (.273)			
Manual*Born 1954-71	-.963 ** (.342)			
Manual*Born 1935-53	-.746 * (.342)			
Semi or Nonskilled * Born 1954-71	-1.348 *** (.309)			
Semi or Nonskilled * Born 1935-53	-1.389 *** (.330)			
Self employed or Farmer * Born 1954-71	-1.221 ** (.464)			
Self employed or Farmer * Born 1935-53	-1.531 ** (.443)			
No Father, No job, or No Answer*Born 1954-71	-.774 * (.343)			
No Father, No job, or No Answer*Born 1935-53	-1.210 *** (.346)			
Constant	-.654 *** (.145)	-2.379 *** (.169)	-.867 *** (.114)	-3.421 *** (.259)
N	3125	3125	3674	3674

Note: + p<.10 * p<.05 ** p<.01 *** p<.001

Figure 5 Predictive probabilities of attending selective university based on father's occupation (men)

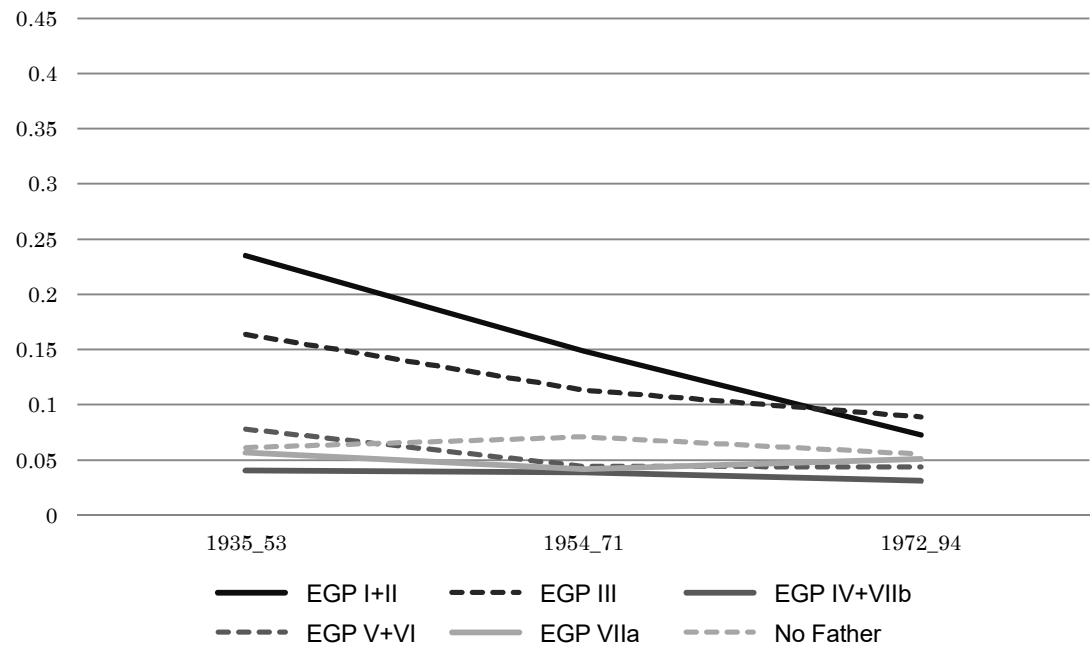


Figure 6 Predictive probabilities of attending (non-selective) university based on father's occupation (men)

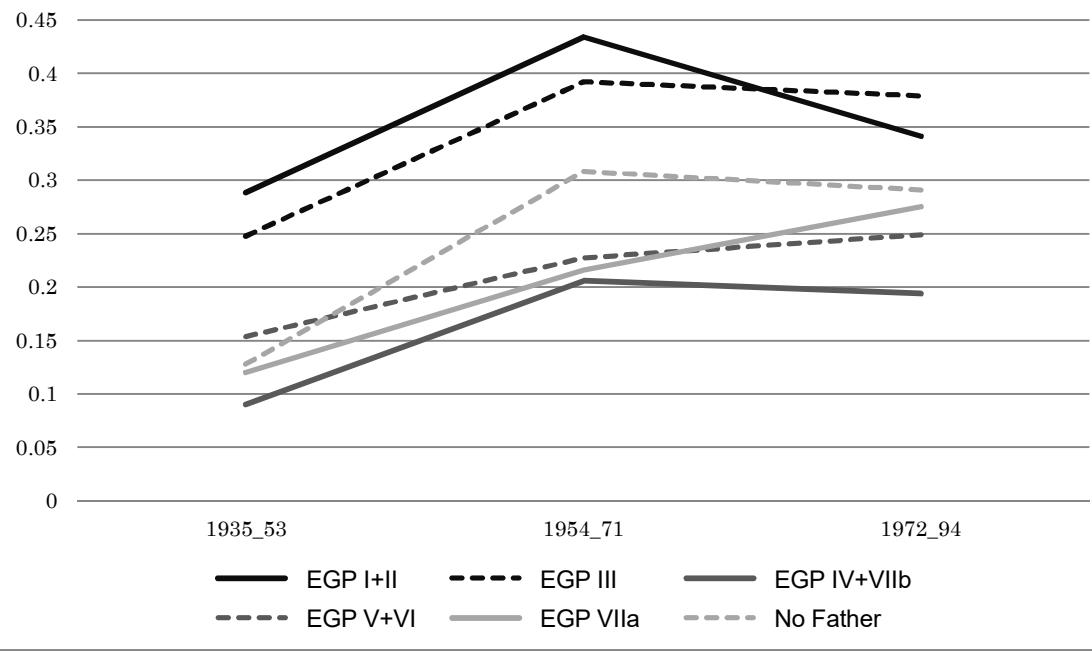


Figure 7 Predictive probabilities of attending selective university based on father's occupation (women)

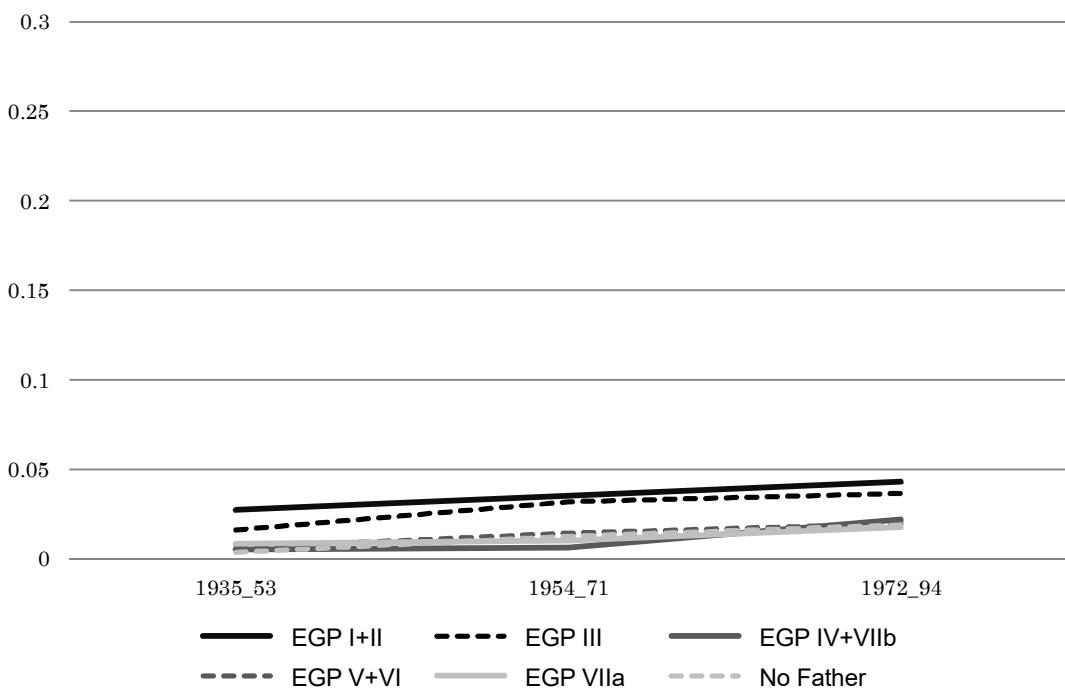


Figure 8 Predictive probabilities of attending (non-selective) university based on father's occupation (women)

