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By

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ABSTRACT

In spite of the significant restructuring of the university system in the postwar period, national universities continue to occupy the top end of the prestige hierarchy of universities in Japan. In this paper, we examine long-term trends in the educational credentials of Japanese corporate executives. We use high-quality data from the directory of corporate executives to assess whether the mechanisms of elite production has changed over time.

We find that the fraction of corporate executives graduating from private universities increased significantly, in accordance with the massive expansion of private universities in the postwar period. At the same time, our cohort-based analysis finds that private university graduates are being recruited into executive positions at a pace that exceeds its natural growth rate. Our findings weaken the view that certain prestigious universities are stable institutions to reproduce the nation's elites. The improved access to university education results in greater educational diversity and heterogeneity among the nation's elites.

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Introduction

The evolution of Japanese university education dates back to the Meiji period (1868 to 1912), when most of the Imperial Universities were founded. Imperial Universities played a crucial role in the Meiji Restoration as training grounds for the nation's elites, and as recruiting pools for the central government ministries (Nagai 1971). Thus began the heritage in which the nation's best and brightest were funneled from one elite institution to the other – from the Imperial Universities to the government ministries.

In the postwar period, authorities of the American Occupation imposed measures to break up the channeling of elites and the prestige hierarchy that characterized the university system (James and Benjamin 1988; Ogura and Iwai 1991). As a result, Imperial Universities were renamed national universities. The educational curriculum was revamped to cater to the general public.

To further increase educational opportunities for the general population, the Ministry of Education granted charters facilitating the launch of private universities. These supply-side reforms, coupled with the growing demand for higher education in the postwar period, led to a massive expansion of the university system, of which a majority of the new institutions were private.

The current study examines long-term trends in "educational credentialism" and elite formation in postwar Japan. How successful were the postwar efforts in dismantling the prestige differentiation among Japanese universities? Did the improved access to university education result in greater educational diversity and heterogeneity among the nation's elites? Or are elites still recruited from a select group of prestigious universities?

While previous studies underscore the importance of university prestige in getting ahead in Japan, what is critically lacking is evidence on a long-term dimension, i.e. how the relationship between educational credentials and elite formation has changed over time. Indeed, the dearth of literature offering systematic examination of how credentialist processes evolve is a general weakness in stratification research (Bills and Brown 2011). This is a pertinent question for stratification scholars when we consider the expansion of the university system in postwar Japan. The supply-side reforms were intended to improve the educational opportunities of Japanese citizens. The reforms did not take place overnight but were implemented over a period of 50 years. This paper attempts to assess the outcome of the reforms through an investigation of the dynamic interplay between educational credentials and elite formation from a historical perspective.

Examining the long-term effect of the expansion of university education on the composition of corporate executives uncovers the mechanism between educational credential and elite formation. If university education is merely an institution to establish credibility for the nation's elites, the expansion of university education should *not* alter the composition of the educational credentials of corporate executives; the executives should continue to be dominated by elite university graduates because non-elite university graduates do not participate in the competition. On the other hand, if graduating from a university in general endows workers with skills required to compete in the race for executives, the expansion of university education should make the composition of educational credentials more heterogeneous.

This paper examines changes in the composition of educational credentials among executives in Japan's publicly traded companies. We show that this composition becomes more heterogeneous as university education expands. When the fraction of graduates from private

universities increase by 10 percentage points, the fraction of private university graduates among company executives increases by 12 percentage points. The increased heterogeneity due to the expansion of university education weakens the view that university education is merely a credential in the path to elite membership.

Background

Japan is a model case to test theories of education and stratification. Key to understanding this association is the concept of "educational credentialism." Broadly defined, credentialism is the "extent to which societies allocate individuals to slots in the occupational hierarchy on the basis of educational qualifications that the candidates present at the point of hire" (Bills and Brown 2011). While the *quantity* of education is the initial criteria for differentiation, the *quality* or prestige dimension is equally important as the means to differentiate university graduates.

Indeed, what sets Japan apart from the experiences of other countries is the extent to which individuals' socioeconomic success is determined by the prestige of the universities from which they graduate. As exemplified by the expression "examination hell," students and their parents invest enormous time, money and resources to gain entry into the nation's top universities (Ono 2007). As Bowman (1981) and others have noted, "examination hell" has continued unabated even as the university system has expanded. Students still compete for the top universities out of firm conviction that these are strongly linked to success. Bowman explains: "In Japan competition for entry to preferred institutions has reached a frenzy probably matched in no other part of the world." (p.15)

Examination hell and the obsessive pursuit of university prestige can only persist in the presence of a prestige hierarchy of universities that is widely accepted. Further, it presupposes that graduation from the prestigious universities brings enormous benefits. We describe below, the evolution of the university hierarchy, and the payoffs associated with university prestige in Japan.

Expansion of the university system in postwar Japan

The University of Tokyo is the genesis of the Japanese university system. It was founded in 1877 as the nation's first Imperial University, with the primary aim of training elites for the central government. The University of Tokyo was the only university in existence until the government established the second Imperial University – Kyoto University – in 1897. During the years leading up to the Second World War, the government established five additional Imperial Universities within Japan – Tohoku, Kyushu, Hokkaido, Osaka and Nagoya – which represented different regions of Japan.

The recruitment of elites from Imperial Universities into the government ministries became an institutionalized practice during the prewar period. Graduates of Imperial Universities received preferential treatment from the ministries; e.g. these graduates were exempt from taking examinations that are required for graduates from all other universities (Brinton and Kariya 1998). Indeed the Imperial Universities became to be widely perceived as an institution to train the nation's elites.

The rapid expansion of the Japanese economy in the postwar period triggered enormous demand for university education. The Japanese government responded by expanding the number of universities in order to improve access to the general public and to increase the overall supply

of university graduates (Ono 2008). This move also reflected in part efforts by the American Occupation who sought to reduce the concentration of power and prestige among the Imperial Universities (James and Benjamin 1988). The Imperial Universities were henceforth renamed national universities, and the preferential treatment between employers and selected universities were significantly dismantled.

The postwar expansion of the university system was achieved mainly by increasing the number of private universities. Between 1949 and 2012, the number of private universities in Japan increased over six-fold, from 92 to 605. The number of national and public universities expanded as well, but at a more modest pace, from 86 to 178 over the same period.

Benefits of the credentialist society

While the overall supply of university graduates increased as a result of the postwar expansion, the extent to which it reduced the prestige hierarchy of universities remains unclear. Previous empirical studies have consistently confirmed that graduates of higher ranking universities are more likely to succeed in the Japanese labor market with respect to career advancement (Ishida, Spilerman and Su 1997), elite formation (Kawaguchi and Ma 2008; Ono 2008), income (Ono 2004; 2007), and occupational prestige (Ono 2008). Scholars have documented how graduating from a highly selective university improves the probability of entering large prestigious firms (Abe 1997; Higuchi 1994).

The prestige differentiation between national and private universities also remains salient. National university graduates have higher rates of return to their university education, and are more likely to be employed in higher prestige occupations than are private university graduates (Ono 2008).

Publications from the popular media persistently confirm that the nation's top universities dominate the top positions in business, government, and politics (Ohashi 1995; Kawaguchi and Ma 2008). Citing the *Nihon Keizai* newspaper survey, Ishida (1993) reports that graduates of the top five universities accounted for 51 percent of all presidents of the most competitive and profitable private firms in Japan. This is a remarkable statistic considering that there are now close to 800 universities in Japan. Undoubtedly, the bias towards higher prestige universities among corporate elites can be observed in other countries, but the comparable statistics are significantly lower, e.g. alumni from the Ivy League schools represented 17 percent of corporate executives in the U.S. (Useem and Karabel 1986).

Conceptual Framework

Educational credentialism and elite formation

There are several ways to explain the link between university prestige and elite formation. Although the theoretical models differ in their assumptions, they are consistent in predicting that more education, or more educational credentials, is associated with greater labor market rewards.

Human capital and screening theories present two alternative explanations of how education may be related to socioeconomic achievement and elite formation. Under the human capital framework, education is an investment which subsequently increases labor market productivity (Becker 1993); elites are selected according to their abilities. If individuals invest resources to get into a university of higher quality, then they will be rewarded with greater payoffs.

The screening model of education does not contradict the human capital model, but is an extension to it (Weiss 1995). Both models predict that higher educational attainment is related to

higher benefits, but they differ in their assumptions. Under the screening hypothesis, higher educational achievement is not necessarily related to higher productivity. Employers do not have sufficient information about the applicants' productivity, so employers use university prestige as "signals" to sort workers into jobs.

Cultural capital theory suggests that the accumulation of cultural capital in the form of educational credentials or academic qualifications determines entry into institutions of power and prestige, and ensures that the status quo is perpetuated and maintained among a handful of elites. The role of elite educational institutions, then, is to preserve tradition and existing hierarchies (Bourdieu 1998); educational requirements (or credentials) are "used by organizational elites to maintain cultural hegemony over their own ranks" (Collins 1974, p.421). The preservation of hierarchy and hegemony among a handful of elites is observed in Japan by the predominance of the alumni of Tokyo University – undoubtedly the highest ranking national university – in positions of power and influence, in politics, government and business. Taira and Wada (1987) explain that Japan Inc. is essentially governed by the exclusive institutional linkages between Tokyo University, government and business organizations, and explain that "personal networks and contacts of public officials and private business leaders render the formal structural distinction of government and business almost meaningless in Japan" (p.264). Thus, the question of "Who governs Japan?" cannot be effectively answered without considering the role of Tokyo University and their alumni who occupy the most influential positions in Japan. Rohlen (1983) echoes this view, and provides several examples of how Tokyo University graduates preserve their status quo. The faculty of Tokyo University is made up almost entirely by their own graduates. In the Ministry of Education which was assigned the task of dismantling

the elite university influence over examinations and jobs, the majority of the top positions were filled by Tokyo University graduates in the mid-1970s.

Social capital theory complements the cultural capital thesis by suggesting that elite formation is achieved through the various network ties and social resources that are embedded between individuals and organizations. Employers may recruit from a selected group of universities, rather than engage in open market recruitment. Empirical studies of Japanese university graduates have found that institutional ties between elite universities and prestigious firms facilitate better employment opportunities for the alumni (Brinton and Kariya 1998; Lee and Brinton 1996; Rebick 2000). Alumni networks (or old-boys networks) may also improve the prospects for upward mobility at later career stages, through their contacts within the organization, and/or across organizations (Abe 2002).

Education and stratification

The Ministry of Education expanded the number of universities in Japan in order to improve educational opportunities for the general population. Overall, access into universities may have improved as a result. But what is not well known is if the broader university access alleviated key economic and social inequalities in the long-run. In the study of elite formation, uncovering a long-term persistent trend where elites continue to be selected from the same universities would indicate that the mechanisms of elite reproduction have not changed over time. It would also indicate that policies targeted at improving educational opportunities have not been as effective as they might appear, at least not with respect to the formation and cultivation of the country's elites.

We examine the null hypothesis that elites continue to be represented by the nation's top universities, in spite of the great expansion of the university system. The "elites" here refer to executives of Japanese corporations. The null hypothesis condition will be rejected if we can confirm the declining role of educational credentials in elite selection.

Data and Methods

Our empirical analysis is based on several data sources. For our primary analysis, we use microdata from *Toyo Keizai Directory of Executives*, for the years 1990 to 2011. For each survey year, data were collected from executives of publicly listed companies in Japan. The data include a wide range of personal information including birth year, name of the educational institution last attended, department or field of study, and year of graduation. The total sample size is 889,126 observations.

The second dataset of executives was compiled from *Diamond Directory of Company Members*, for the years 1977 to 2011. We were unable to obtain the microdata for this directory. We constructed the dataset by manually entering the data from the published hard copy version into electronic data format. The directory includes data collected from managers and executives among the publicly listed companies in Japan. For the purpose of our empirical analysis, we will use the data for executives, and exclude those for managers. For each survey year, the directory provided a tabulation of executives broken down by the universities that they graduated from. The benefit of the Diamond data is that it covers a longer time span. However, because it is aggregated cell data, we are unable to conduct empirical analysis in multivariate form. We will use the Diamond data as a secondary data source to supplement our analysis using the Toyo Keizai data.

We collected a measure of university selectivity from the 1986 publication *Keisetsu Jidai* published by Obunsha. This is a standardized score (*hensachi*) that estimates the difficulty of gaining entry into the universities based on the results of the entrance examinations. Higher scores indicate higher selectivity. Lower scores indicate the opposite. For every respondent, we matched the selectivity score for the university that s/he graduated from. Ideally, we want to match the selectivity score that is specific to the year that the respondent graduated in. However, past studies have established that selectivity remains relatively stable over time (Ishida, Spilerman and Su 1997), and we assume this in our analysis.

And finally, we collected historical data on the number of university graduates, broken down by national versus private universities, to control for the historical expansion of the university system. The data are taken from the School Basic Survey (*Gakko Kihon Chosa*), available online from the Ministry of Education, Culture, Sports, Science and Technology (MEXT). The data coverage starts from the year 1948.

Analysis and Results

We begin by examining the distribution of the university selectivity scores between national and private universities based on the data collected from the 1986 Obunsha publication (see Figure 1). We note here that national universities include public universities in our analysis unless otherwise noted.

The distribution clearly shows that the legacy of national universities persists even today. National universities continue to outperform the private universities by occupying the higher end of the distribution. The mean selectivity score is 58.5 in national universities, compared to 49.5

in private universities. The distribution is also wider in private universities compared to national universities.

Figure 1 about here

Figure 2 shows trends in the proportion of private university graduates. The data trend "private average" shows the proportion of private university graduates among all university graduates, using the data collected from the MEXT database. From our data, we estimated that the average year of the executives is 60, and the average age of graduation from university is 22, suggesting that the average executive has an employment history of 38 years since graduation. We subtract 38 from the survey year and use the average share of private university graduates for that year. For example, in the survey year 2000, we use the average for the year 1962.

Figure 2 about here

Both data – Diamond and Toyo Keizai – show a steady increase in the ratio of private university graduates among executives. The Toyo Keizai data show a modestly higher fraction than the Diamond data. More conspicuously, both data show a considerable gap when compared to the overall average. This gap has not narrowed over time. In other words, the distribution of national versus private university graduates among executives does not reflect its true distribution among the population of university graduates. Executives are consistently under-represented from private universities, and over-represented from national universities.

We next focus on the top universities that have dominated the school rankings among executives. The six universities listed here are those with the highest share of executives. Tokyo and Kyoto are the two top national universities. Waseda, Keio, Chuo and Nihon are the private

universities. The top panel shows the plots from the Diamond data, and the bottom panel shows the corresponding plots from the Toyo Keizai data. Both graphs show nearly identical trends and numbers, and we highlight these below.

Figure 3 about here

We again observe the declining share of national university graduates relative to their private university counterparts. The most dramatic change is the declining share of graduates from the University of Tokyo, from 28 percent in 1976 to 8 percent in 2010. We observe a similar declining trend, albeit less dramatic, among Kyoto University graduates, from 14 percent to 5 percent during the same years. The share of executives from the private universities remained relatively stable during this period, with the possible exception of Chuo University whose share expanded from 3 to 4 percent between 1976 and 2010.

In Figure 4, we estimated the share of executives from the top six universities by survey year. The data again are nearly identical for the two data sources (except for the time lag), with a conspicuous downward trendline. In 1976, graduates of the top six universities dominated 69 percent of all executives. In 2010, this proportion was down to 37 percent.

Figure 4 about here

Figure 4 also includes a second data plot which shows the average university selectivity scores. For any given year, each point represents the average university selectivity score of all universities that the executives graduated from (in the Toyo Keizai data). This trendline is virtually flat. Overall, the average selectivity score declined from 64.3 to 62.1 during 1991 and 2010.

We now take advantage of the Toyo Keizai microdata and reexamine the data by graduating cohort rather than by survey year. By controlling for the graduating year cohort, we

are able to better match the composition of the private university graduates among executives to its true composition in the aggregate as provided by the MEXT data. For this analysis, we truncate the data starting from the 1950 to the 1980 graduating cohort, because the number of executives who graduated before 1950 and after 1980 is relatively small.

Figure 3 indicates the fraction of company executives who graduated from private universities alongside the overall average for corresponding years collected from the MEXT database. The share of executives graduating from private universities has steadily increased from 46% among the 1950 graduating cohort to 72% among the 1980 graduating cohort. The increase of executives graduating from private universities itself is not surprising because the fraction of private university graduates in the overall population of university graduates increased from 61% among the 1950 graduating cohort to 75% among the 1980 graduating cohort (MEXT data). The increasing share of executives from private universities may therefore be a natural consequence which resulted from the increasing overall share of private university graduates. However, the growth of the share of private university graduates among all executives is faster than the natural growth of private university students among all university students as the two graphs in Figure 6 indicate.

We ran a simple regression to quantify the overall trend that the share of private university graduates among executives ($P_{executive}$) outpaces its counterpart in the overall population of university students ($P_{graduates}$). We apply weighted least squares using the number of executives of each cohort as the weight. The regression result is:

$$\widehat{P}_{executive} = \underset{(0.07)}{-0.33} + \underset{(0.10)}{1.26} P_{graduates}, N = 31, R^2 = 0.86 .$$

Standard errors are reported in the parenthesis below the estimated coefficients. The R^2 implies that the increase of private university graduates explains 86% of the increase of corporate executives who graduated from private universities. The estimated coefficient on the fraction of private university students, $P_{graduates}$, is 1.26; a ten-percentage-point increase in the share of private university students increases the share of private university graduates among executives by 12.6 percentage points. The coefficient is statistically different from 1 and clearly indicates that the growth of private university graduates among executives outpaced the natural increase of private university students among all university students.

As we have already seen in Figure 2, the fraction of company executives who graduated from private universities is below the fraction of private university graduates among all university graduates: private university graduates are under-represented among company executives. The cohort based analysis in Figure 6 reconfirms the under-representation of private university graduates among executives. At the same time, we find that private university graduates are being recruited into executive positions at a pace that exceeds its natural growth rate. We thus observe that the gap between the two have converged over time.

Figure 7 displays the fraction of corporate executives who graduated from the six leading universities. Consistent with the previous finding that the graduates from national universities have diminished their presence among corporate executives, the fraction of University of Tokyo graduates decreased from 15% in the 1950 graduating cohort to 5% in 1980 the graduating cohort. It is worthy to note here the conspicuous dip in the 1973 graduating cohort, presumably caused by the admission freeze of the University of Tokyo in 1969, as documented in Kawaguchi and Ma (2008).

The fraction of Kyoto University graduates follows a similar declining trend. While the share of graduates from the two leading national universities, Tokyo and Kyoto, has diminished, graduates from the two leading private universities, Waseda and Keio, have maintained or slightly increased their presence. The fractions of both Keio and Waseda graduates fluctuate between 5% to 10% between the 1950 and 1980 graduating cohorts. The fractions of Chuo and Nihon graduates did not change significantly over the years.

Conclusion

National universities played a prominent role in the production of elites in Japanese society. Originally founded as an institution to prepare and train their graduates into careers in the government ministries, national university graduates occupied leading positions in government, politics and business, and were to a large extent synonymous with elites. National universities underwent significant transformations in the postwar period. Institutional linkages between national universities and government ministries were dismantled. The prestige hierarchy of universities, with national universities positioned above private universities, was greatly eroded with the massive expansion of private universities.

Against this backdrop, we examined long-term trends in the educational credentials of Japanese corporate executives, to assess whether the mechanisms of elite production has changed over time. In accordance with the post-war expansion of university education, particularly of private university education, the fraction of corporate executives graduating from private universities increased significantly. However, we also find that private university graduates are under-represented, and national university graduates are over-represented among the executives.

The finding supports, at least in part, the prevailing view that the nation's elites are more likely to be recruited from national (and less from private) universities.

At the same time, we find evidence which shows that the dominance of graduates from the top universities has dwindled over time. Most remarkably, the share of graduates from the University of Tokyo declined from 28 percent to 8 percent between 1976 and 2010. Overall, the share of graduates from the leading six universities declined from 69 percent to 37 percent during this period.

Finally, our cohort-based analysis finds that private university graduates are being recruited into executive positions at a pace that exceeds its natural growth rate. We thus observe that the gap between the two – between the share of private university graduates among executives versus its share among all university graduates – has narrowed among recent cohorts of executives.

Our findings weaken the view that certain prestigious universities are stable institutions to reproduce the nation's elites, and that the path to elite membership is limited to their graduates. Rather, the increased heterogeneity of the educational credentials of corporate executives suggests that university education improves workers' skills and allows them to participate in the competition for power and prestige. The improved access to university education results in greater educational diversity and heterogeneity among the nation's elites.

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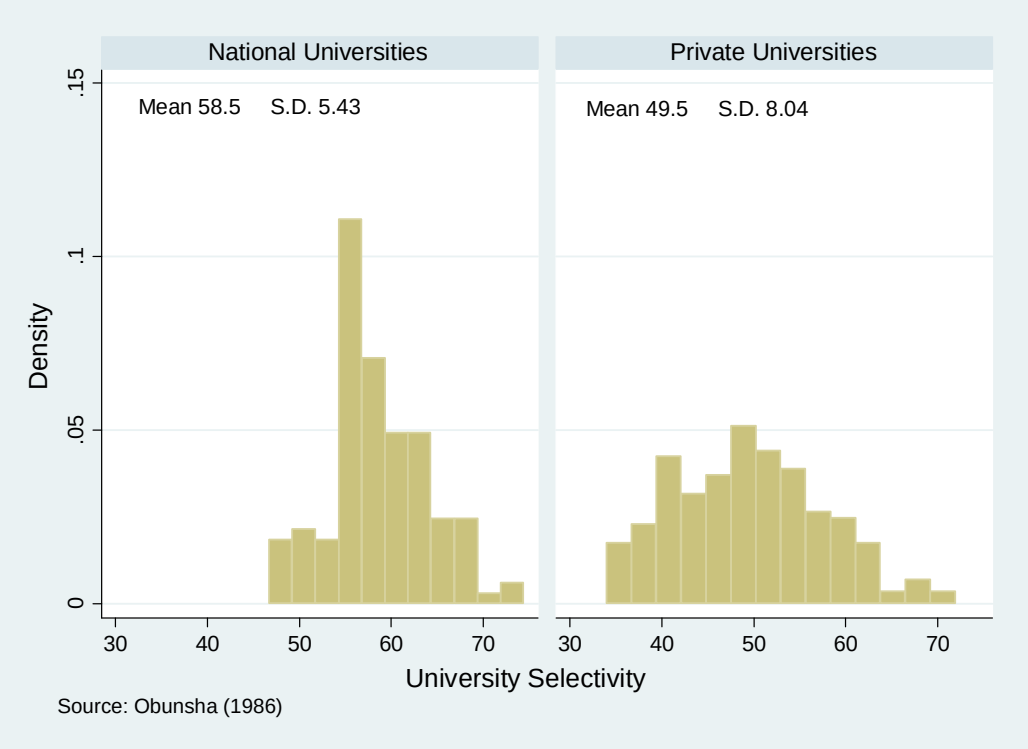

Figure 1 Distribution of university selectivity scores – National versus private universities

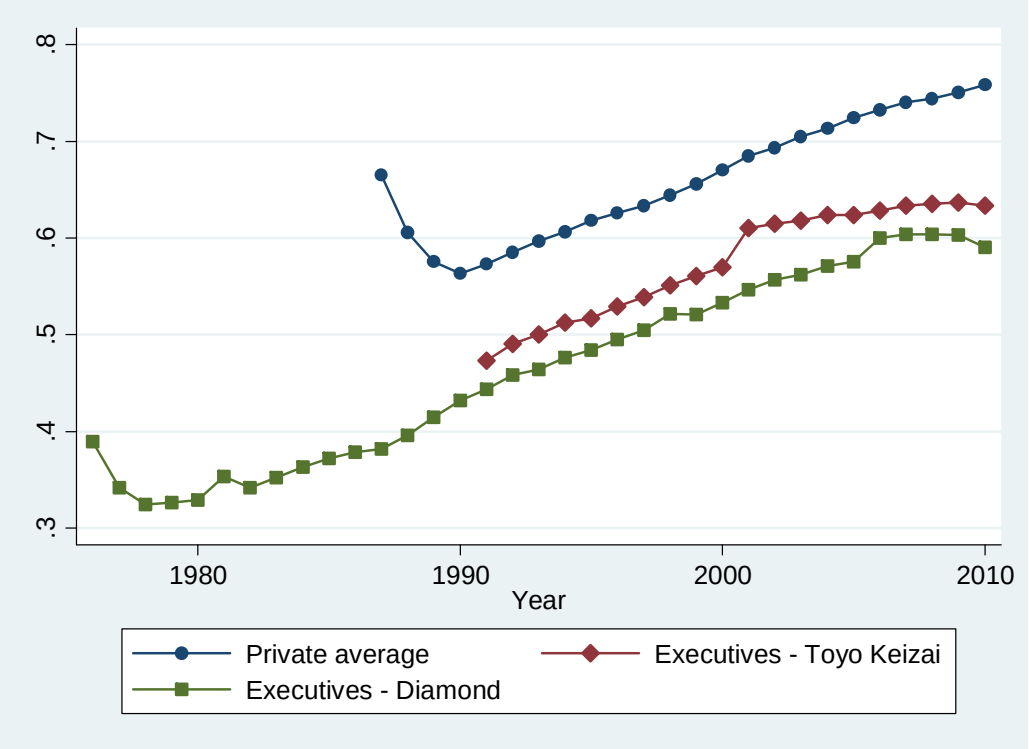

Figure 2 Fraction of private university graduates among executives by survey year

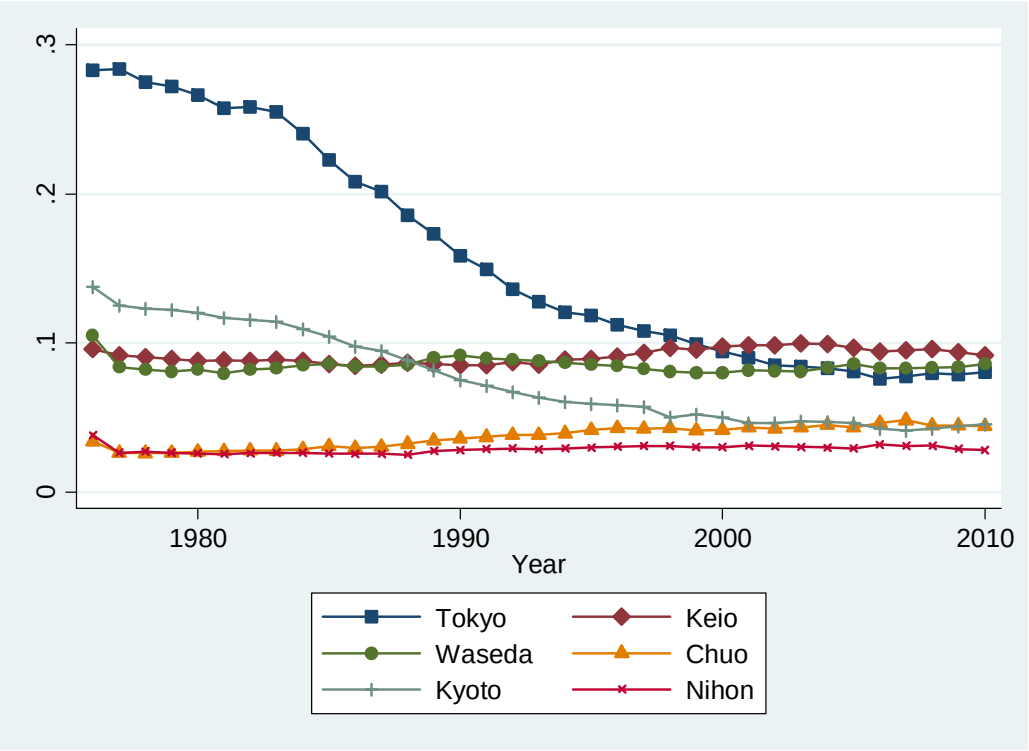

Figure 3 Fraction of executives from selected universities by survey year (Diamond data)

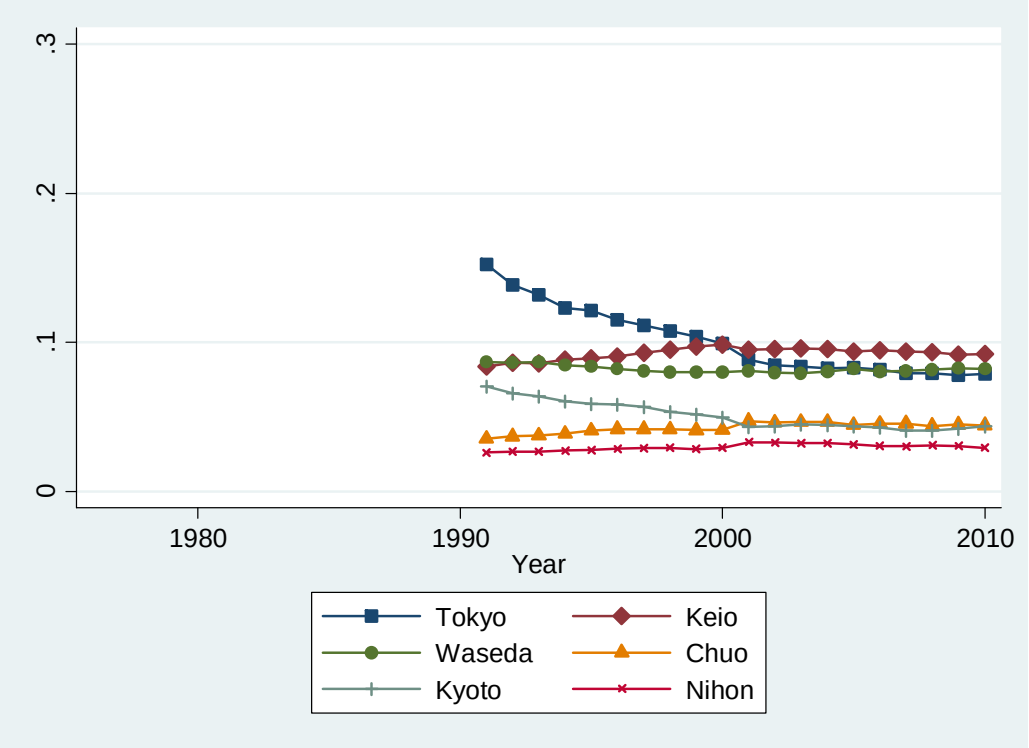

Figure 4 Fraction of executives from selected universities by survey year (Toyo Keizai data)

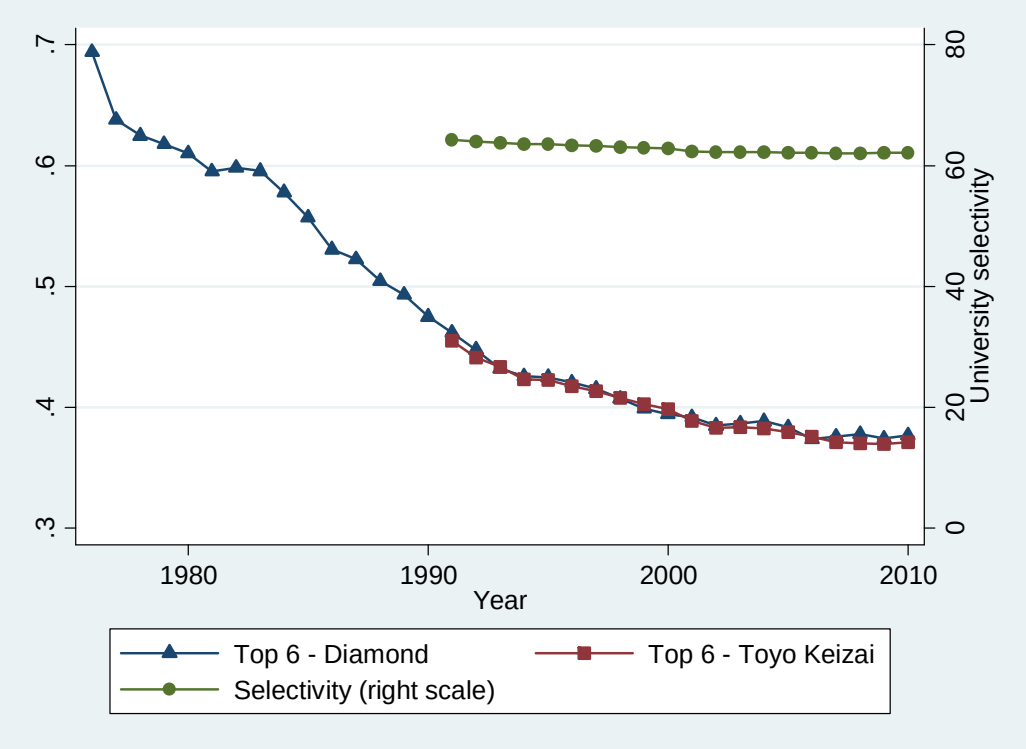

Figure 5 Fraction of executives from top 6 universities and average selectivity scores of graduating universities, by survey year

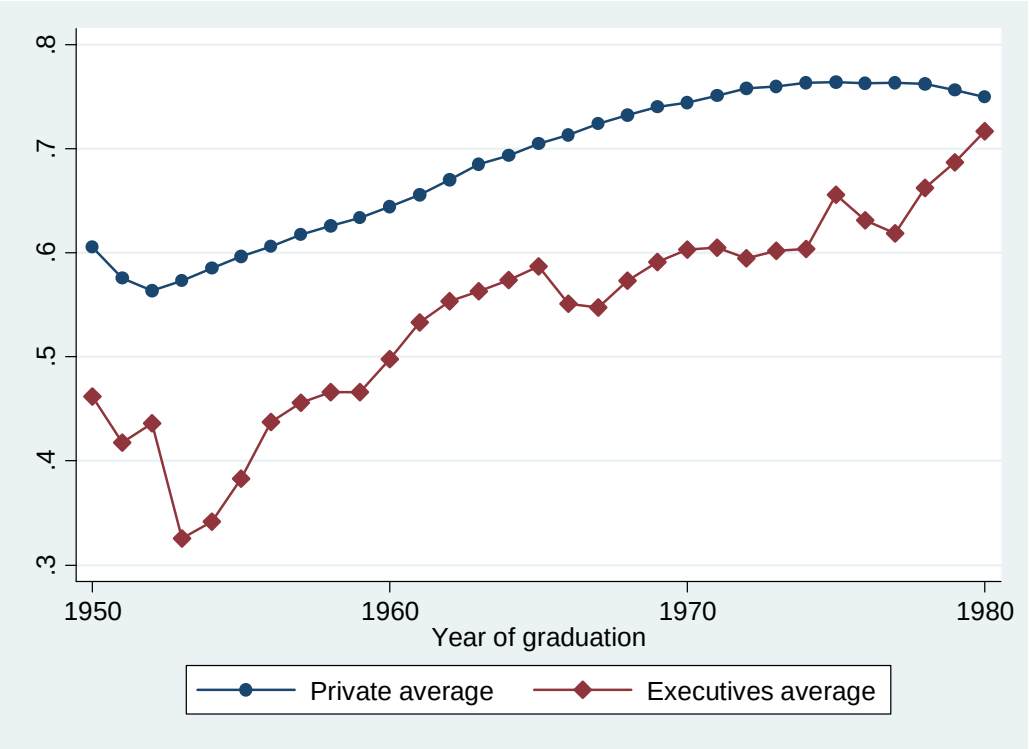

Figure 6 Fraction of private university graduates among executives by graduating cohort

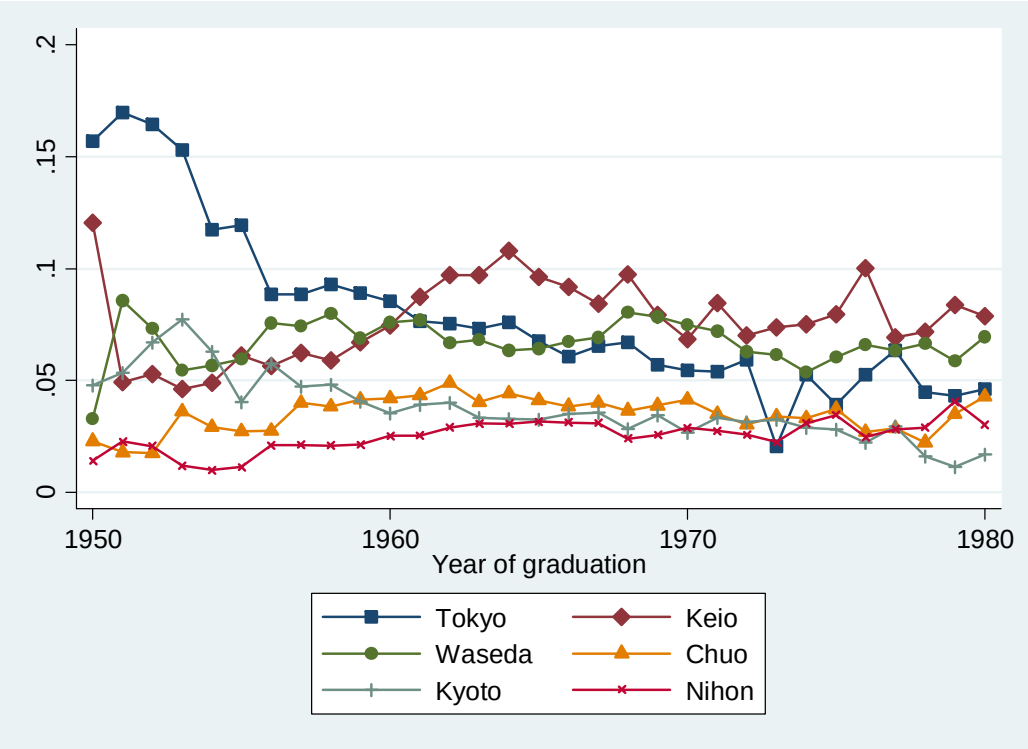

Figure 7 Fraction of executives from selected universities by graduating cohort (Toyo Keizai data)