

Article

Self-image and Missions of Universities: An Empirical Analysis of Japanese University Executives

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Abstract: As universities in Japan gain institutional autonomy in managing internal organizations, independent of governmental control as a result of deregulation and decentralizing reforms, it is becoming increasingly important that the executives and administrators of each institution demonstrate clear and strategic vision and ideas to external stakeholders, in order to maintain financially robust operations and attractiveness of their institutions. This paper considers whether and how the self-image, mission, and vision of universities are perceived and internalized by the management of Japanese universities and empirically examines the determinants of shaping such individual perceptions. The result of our descriptive analysis indicates that the recent government policy to internationalize domestic universities has not shown much progress in the view of university executives in Japan. An increasing emphasis on the roles of serving local needs in research and teaching is rather pursued by these universities. Individual perceptions among Japanese university executives with regard to the missions and functional roles to be played by their institutions are influenced by managerial rank as well as the field of their academic training. A multiple regression analysis reveals that the economy of scale brought out by an expanded undergraduate student enrollment gradually slows down and decelerate executive perceptions, with regard to establishing a globally recognized status in research and teaching. Moreover, Japanese universities with a small proportion of graduate student enrollment, likely opted out from competitions for gaining a greater respect in the global community of higher education between 2005 and 2012. Finally, the management in

universities granted with the same amount of external research funds in both studied years responded more passively in 2012 than did in 2005 on the self-assessment of whether having established a status as a global knowledge base.

Keywords: university missions; university management; globalization of higher education; universities in Japan

1. Introduction

A series of recent efforts by the central government in structurally reforming and reorganizing the country's public sector has empowered Japanese colleges and universities with autonomous control in internal governance with stronger leadership of the university president and board of trustees. Corporatization of the national universities in Japan, which took place in 2004, particularly expanded the financial and managerial autonomy of individual institutions, in exchange for reduced public subsidies for basic operation and research activities undertaken by these universities [1–3]. The new structure of internal governance requires stronger leadership by university executives and managers than that demonstrated by their predecessors, facilitating effective organizational management while strengthening institutional missions and identity of each university, which in turn generates financial robustness and attractiveness of these institutions [4,5].

Behind the reinforced institutional autonomy with empowerment of university leaders lies the massification issue of higher education, coupled with a sharp decline in the 18-year-old bracket population faced by the country. Expansion of Japan's higher education began in the early 1960s with the tailwind of dramatic economic growth experienced by the nation throughout the post-war industrializing period and steadily continued until the early 2000s [6,7]. Rapidly massifying higher education, however, is claimed to have generated a growing enrollment of students with diverse interests, along with wide dispersion in entrants' academic qualifications in Japan's colleges and universities [8,9]. Individual institutions founded upon distinctive missions and educational goals, however, often have a limited capacity to equally serve the growing needs of students' manifold interests. Corresponding to the increasingly diverse nature of higher learning, the Ministry of Education, Culture, Sports, Science, and Technology (referred to as the MEXT henceforth) has been promoting a system of differentiated higher education, which encourages each institution to establish uniquely distinct functional roles and differentiated missions [10,11]. Accordingly, effective internal management and institutional governance soon became a critical agenda in the debate of Japan's higher education policies [12]. Nevertheless, the process through which institutional missions and academic priorities are formed may vary among universities with different cultural and historical backgrounds in the long term. It may well be critically affected in the short term by the self-images developed by individual executives and managers in place.

This paper examines the self-images of universities through analysis of the assessment by the university executives with regard to various aspects of functional roles played by their institutions, as well as how their perceptions contribute to shaping the future missions of each university. More specifically, what functional roles and missions does each university consider to have performed

successfully, and how does the assessment by the management affect the functional roles to be performed in the future? One hypothetical view suggests that the missions of a university may have been shaped through acquired prestige, e.g., as represented by various university rankings, as well as institution size (e.g., total student enrollment) and scope (e.g., breadth of academic fields represented by the number of undergraduate departments and graduate schools) that each institution has established, and, thus, expects to follow the same trajectory in the future. Another view may postulate that academic priorities and missions of a university have been, and continue to be, affected by the attributes of the incumbent president and executive board members, e.g., age, gender, field of academic discipline, career path and previous experiences, and so forth. In this view, therefore, university identity is not necessarily consistently inherited over time. This paper sheds light on these issues by examining how such institutional, as well as individual characteristics affect particularly the global-orientation of Japanese university executives, which has recently been raised as an important policy agenda by the MEXT in an effort to internationalize domestic universities. This study takes advantage of two separate data sources, *i.e.*, one collected in 2005 immediately following the corporatization of national universities and another conducted more recently in 2012. The questionnaires were sent out nationwide in both years to president, deans, and department chairpersons of each university as the potential sample target, asking them to self-assess their own institutions with regard to various aspects of performance as well as their aspirations in the future.

The content of this paper proceeds as follows: a brief review of related preceding studies is provided in the next section. Then, a simple description of the data sets used for the analysis is discussed in the third section, followed by a descriptive overview of the self-assessment results obtained from Japanese university executives with regard to their institutional performance. The result of statistical analysis is discussed in the fifth section, and the last section concludes.

2. Background and Related Literature

From a historical viewpoint, the public investment in higher education made by the Japanese government has concentrated on subsidizing the former imperial universities, as well as a handful of premier national universities in the country [13]. This nepotistic treatment by the central government has contributed to maintaining a distinctly advantageous status of these elite national universities relative to other institutions of higher education that are ranked secondary to the top-tier universities [13,14]. Over the last few decades, Japanese universities and colleges have also experienced the evolutionary phases of higher education, *i.e.*, from the elite to mass to universal stages as proclaimed by Trow [15]. As a result of the rapid expansion in postsecondary enrollment which coincided with the nation's dramatic economic growth in the 1960s through 1980s, the proportion of high school graduates who pursue their formal education at four-year institutions rose from below 10 percent in 1960 to over 40 percent in 2003, while the matriculating students at four- and two-year institutions jointly accounted for nearly one half of the total high school graduates in the same year [7,16].

Concurrent with the massification of higher education, which is inherently an issue to be resolved domestically, Japanese universities and colleges are now externally challenged by severe competition, particularly with the neighboring Asian countries. In order to face up to this emerging global challenge, the Center of Excellence (COE) Program was introduced in 2002 by the Japanese

government as a national policy to gain an improved position in the global competition through strategic provision of competitive research funds to a select few universities. Preceding the COE Program, however, similar national policies were also approved in neighboring countries, such as the Project 211 and 985 Project of China which advocated “allowing a few to become rich first” [17], as well as the Brain Korea 21 (BK21) implemented by the South Korean government in 1999 for the objective of promoting Korean universities in the world university rankings. Some of these large-scale strategic research grants are found to have a positive effect on increasing research publications in these countries as well as in Europe [18]. Research activities in science and technology in China particularly tend to “dominate all contemporary discussion about universities reaching world-class standards” [19] as “Chinese academics point most often to greater acceptance of research in international journals, especially in the natural and physical sciences” [20]. Due to this recent and radical development in research activities in the neighboring countries, triggered by the strategic allocations of competitive funds with the “select and concentrate” scheme, the once predominant status of Japanese flagship universities in scientific research has gradually slid over the region [14].

In recent years, a functionally differentiated system of higher education has been promoted by the MEXT, in urgent response to increasingly diverse and competitive environments surrounding today’s institutions of higher education. Unique and distinctively classified universities and colleges are claimed to serve manifold interests and needs of stakeholders arising at all levels, *i.e.*, local, national, and international, while allowing each institution to stand out in their own chosen niche. A comprehensive and historical review of Japanese university classification over the post-war period is provided by Kobayashi [21], who discusses that the history of institutional classification in Japan began with simple typology of higher education institutions by study length, *i.e.*, four-year universities versus two-year colleges, and then expanded to cover technical colleges (*kōtō senmon gakkō*) as well as the Open University of Japan (formerly known as the University of the Air), which in practice does not have its own campus [22]. Kobayashi [21] further discusses that the issue of institutional classification in Japan has recently been redirected towards establishing a functionally differentiated higher education system whereby each institution redefines its functional roles and missions according to the institutional scale, scope, and traits that each institution has developed over the course of their growth.

Although multiple classifications of Japanese colleges and universities have been proposed by various scholars of higher education in Japan [8,23–28], the basis of the typology often rests on a simple establishment type, *i.e.*, former imperial universities, national colleges (*kanritsu daigaku*), private technical colleges (*kyūsei senmon gakkō*), in addition to the size of undergraduate and graduate student enrollment, as well as existence of graduate schools. Moreover, various proposals pertaining to officially categorizing the postsecondary institutions have appeared in government reports in the past from time to time, but “these government ideas have not been carried out to this day” [14]. As a result, the classifications of Japanese higher education institutions tend to capture only superficial aspects of individual institutions. The leadership, vision, and philosophy of the incumbent management, which may critically influence the functional roles and mission of each institution, are therefore rarely reflected in these classifications. There exists only limited literature [29–32], which empirically studied the perceptions of managerial personnel and administrators in the context of developing the

unique identity of individual institutions, and, thus, a functionally differentiated system of higher education. The analysis of this paper capitalizes on these recent endeavors.

3. Data

The data used in this study consists of two components. The first set of information draws on the data set collected in a survey research entitled “Survey on University Organizational Reforms (*Daigaku no Soshiki Kaikaku ni Kansuru Chōsa*)” which was conducted as part of the Center of Excellence (COE) research project, “Construction and Quality Assurance of the 21st Century Higher Education (*21 Seiki-gata Kōtōkyōiku System Kōchiku to Sitsuteki Hoshō*)” funded by the MEXT through 2002 and 2007. The survey questionnaire was distributed nationwide by postal mail to 7554 individuals from March through April 2006, with the intended sample targets of presidents, deans, and department chairs of domestic colleges and universities, from which 2328 responses (a valid response rate of 30.8 percent) were obtained [33]. The original survey was designed to grasp the ongoing efforts of organizational reforms internally carried out by individual institutions, as well as their future plans in further reorganizing academic divisions and research units. The future image held by the management of each institution would constitute a critical element in drawing a blueprint for shaping future academic priorities and university mission. Accordingly, the questionnaire requested the respondents to assess the performance of their own institution in multiple aspects of teaching and research activities. Capitalizing on the assessment of the current institutional performance, the questionnaire also asked about their aspirations for reaching higher achievement in various activities and roles fulfilled by the institution in the future.

The second source of information was sought from a data set collected in a collaborative effort by research units of multiple universities under a research project entitled “Organizational Management and Personnel Education in Universities (*Daigaku no Soshiki Unei to Management Jinzai Ikusei*)” in 2012 [34]. The survey was conducted from April through May 2012, with questionnaires mailed to the sample targets of presidents, trustees/vice-presidents, deans, department chairs, as well as trustee board chairpersons of all the colleges and universities in Japan regardless of the type of establishment, *i.e.*, national, local (prefectural/municipal), and private institutions. The questionnaire included a set of items inquiring of the respondents to self-assess their own institution in various respects as well as individual aspirations that are common to the items included in the 2005 survey. The total of 2714 responses was obtained from the potential 8989 individuals, representing a valid response rate of 30.2 percent. In order to maintain consistency in comparing the 2005 and 2012 survey results, responses from trustees/vice-presidents and trustee board chairs were dropped in the 2012 data set, and only the responses provided by presidents, deans, and chairpersons were used for the purpose of our analysis. As a result, the final sub-sample of 2353 individuals was selected from the 2012 data set. Table 1 presents simple distributions of both samples.

The two independent data sets demonstrate reasonably similar and comparable distributions, although university presidents in the 2005 survey (11.7 percent) appear to be slightly underrepresenting the sample as compared with the same group of respondents in the 2012 survey (12.8 percent), while the 2012 data contains a smaller proportion (25.7 percent) of deans than found in the 2005 data set (26.9 percent). Nonetheless, slight differences in the sample distributions could be appropriately controlled through a statistical treatment, and it is done so in the following multiple

regression analysis (Section 5). Thus, it is noteworthy that the small distributional differences in the samples do not affect the implications drawn from our analysis results.

Table 1. Cross-tabulation and distributions of the 2005 and 2012 surveys.

Year/ position	Number				Percent			
	National	Local *	Private	Total	National	Local *	Private	Total
2005								
President	60	37	176	273	2.6	1.6	7.6	11.7
Dean	223	57	343	624	9.6	2.5	14.7	26.9
Chairperson	447	118	867	1433	19.2	5.1	37.2	61.5
Total	730	212	1386	2328	31.4	9.1	59.5	100.0
2012								
President	52	42	208	302	2.2	1.8	8.8	12.8
Dean	188	64	352	604	8.0	2.7	15.0	25.7
Chairperson	426	117	904	1447	18.1	5.0	38.4	61.5
Total	666	223	1464	2353	28.3	9.5	62.2	100.0

* “Local” institutions include colleges and universities founded by prefectural, city, and municipal government units.

4. Descriptive Analysis

4.1. Changing Perceptions of Japanese University Executives

In this subsection, the perceptions of Japanese university executives are examined based on their own assessment of various functional roles performed by their institutions at present and roles to be performed in the future. A similar descriptive analysis is also provided for different managerial ranks, *i.e.*, presidents, deans, and chairpersons, as well as their field of academic discipline in the following subsections. Table 2 presents the proportions of university executives who acknowledge the listed items of various academic priorities as “already implemented at present” and “to be emphasized as an important agenda in the future”. More specifically, the questionnaire inquired of each respondent whether the listed item (a) is currently implemented, and (b) should be implemented/emphasized in the future. The executives in the sample then selected their answers, which most adequately correspond to the current state, from among the following three-point rating: (a-1) not implemented/achieved at all; (a-2) implemented/achieved in some measure; and (a-3) already implemented/achieved. Similarly for the normative issue of what ought to be emphasized in the future, the respondents selected one of the answers from among (b-1) should/will not be emphasized; (b-2) should/will be emphasized in some measure; and (b-3) should/will be emphasized. An identical set of questions were provided in both the 2005 and 2012 surveys, and Table 2 presents the proportions of the respondents giving the most definitively positive response, *i.e.*, (a-3) and (b-3).

Table 2 shows that 12 and 11 percent of Japanese university executives responded that their institution has already established itself as “a global research base” in 2005 and 2012, respectively, whereas approximately one-third (30.4 percent in 2005 and 31.6 percent in 2012) of the respondents acknowledged that establishing such a status is an important future agenda for their institutions. Similarly, while less than 10 percent self-assessed their institutions as being “a global education base” in both survey years, more than three times as many respondents (26.3 percent in 2005 and 30.4

percent in 2012) raised it as an important future agenda of their institutions. Although a clear designation of what ought to be included in the definition of “global research and education bases” was not specifically provided in the questionnaires, these notions are generally accepted in the context of becoming a “world-class university” with improved visibility in the global arena through increased scholarly publications as well as acquiring and producing award winning scholars and graduates. In the words of the Japan Society for the Promotion of Science (JSPS) which is a subsidiary agency of the MEXT who sponsors the COE Program, “the program seeks to elevate Japanese universities to the world’s highest echelons, while fostering people of talent and creativity who will be qualified to assume roles as world leaders” [35]. In any case, the result in Table 2 clearly indicates that the policy implementation towards the goals set by the MEXT [36] for further internationalizing domestic universities did not show much progress, at least in light of Japanese university executives, between 2005 and 2012 [37,38].

Table 2. Proportions of Japanese university executives acknowledging the listed academic priorities with positive perceptions.

Institutional priority	2005		2012	
	Present	Future	Present	Future
Becoming a global research base	12.2	30.4	11.3	31.6
Becoming a global education base	8.2	26.3	9.2	30.4
Becoming a local research base	31.7	66.7	42.7	69.1
Becoming a local education base	39.4	72.8	49.1	72.6
Cultivating a highly skilled workforce	37.5	66.2	46.6	66.7
Cultivating a broad skill set	39.5	59.3	41.2	59.2
Comprehensive and general education	27.5	44.3	27.3	48.4
Cultivating the arts and athletics	17.5	20.6	15.8	19.9
Industry-academia collaboration	25.9	57.8	32.6	59.7
International exchange	27.1	58.0	33.5	65.8

The numbers represent the proportions of Japanese university executives positively acknowledging the importance of each item presently as well as in the future.

In contrast to establishing a global academic hub, much larger proportions of Japanese university executives self-identify their institutions currently serving the needs of local communities in research activities (31.7 percent) and teaching (39.4 percent) in 2005. The emphasis on the local missions expanded by 2012, with larger proportions (42.7 percent and 49.1 percent for research and teaching, respectively) responding that their institutions currently serve the local needs in 2012. Furthermore, over two-thirds in both surveys indicated that further establishing their institutions as a local knowledge base for research and teaching is an important goal to be emphasized in the future. These descriptive results demonstrate a clear pattern of increasing emphasis on local contributions among Japanese universities, while an effort to achieve a global status permeates to a smaller extent. The finding is certainly contrary to the government’s policy goals, for which the MEXT pledged a parallel effort to promote both internationalization of domestic universities and their local contributions [36].

In general, Table 2 highlights that Japanese university management perceived a wide gap between the status quo and the future vision in both surveys. The 2005–2012 comparison also indicates that

these universities successfully enlarged some of the roles, e.g., “cultivating a highly skilled workforce” (37.5 percent in 2005 to 46.6 percent in 2012) and “industry-academia collaboration” (25.9 percent in 2005 to 32.6 percent in 2012), filling the present-future gap of institutional performance.

4.2. Perceptions of Japanese University Executives by Managerial Rank

The perceptions of Japanese university executives are presented by managerial rank in Table 3. A larger proportion of university presidents in 2012 generally assessed the current performance of their institutions more positively than deans and chairpersons. Regardless of the rank, substantial percentages (e.g., from one third to more than a half) of the university management affirmatively rated serving local needs in research and teaching as well as producing highly trained manpower with a broad skill set as the academic priorities fulfilled successfully by their institution in 2012. Japanese university presidents in the 2012 survey also revealed a greater sense of responsibility than deans and chairs with regard to the future vision and roles to be played by their institutions. In general, a greater percentage of positive assessment was obtained in a hierarchical order of presidents, deans, and chairs, as if depicting the structure of authority or leadership within organizations.

Table 3. Proportions of Japanese university executives acknowledging the listed academic priorities with positive perceptions, by managerial rank.

Year/institutional priority	Present			Future		
	President	Dean	Chair	President	Dean	Chair
2005 survey						
Becoming a global research base	11.9	13.6	11.7	27.8	32.7	29.9
Becoming a global education base	9.2	8.5	9.8	27.2	27.6	25.5
Becoming a local research base	30.5	33.3	31.1	62.2	69.4	65.5
Becoming a local education base	52.7	43.6	35.1 ***	80.9	74.9	70.3 ***
Cultivating a highly skilled workforce	41.8	40.0	35.6	69.7	67.9	64.7
Cultivating a broad skill set	43.5	40.9	38.2	58.5	61.3	58.6
Comprehensive and general education	27.9	30.6	26.1 *	51.0	48.4	41.2 ***
Cultivating the arts and athletics	18.0	16.8	17.7	20.7	19.7	20.9
Industry-academia collaboration	27.0	27.7	24.9	58.0	61.4	56.3
International exchange	32.3	28.0	25.7 **	62.5	63.4	54.9 **
2012 survey						
Becoming a global research base	9.5	11.8	11.4	26.4	33.9	31.6
Becoming a global education base	11.1	8.1	9.3	34.5	32.0	28.9
Becoming a local research base	44.5	42.9	42.2	71.3	71.2	67.8
Becoming a local education base	58.7	50.4	46.5 ***	80.5	75.3	69.9 ***
Cultivating a highly skilled workforce	55.4	48.1	44.1 **	72.1	67.5	65.2
Cultivating a broad skill set	50.5	42.9	38.6 ***	66.0	60.6	57.2 *
Comprehensive and general education	29.3	27.5	26.8	54.8	49.9	46.4 +
Cultivating the arts and athletics	16.9	15.2	15.8	23.8	19.3	19.4
Industry-academia collaboration	33.3	33.0	32.3	62.2	60.2	58.9
International exchange	36.4	34.0	32.7	68.7	69.7	63.6 +

The numbers represent the proportions of university executives positively acknowledging the importance of each item presently as well as in the future. The differences among the ranks are significant at *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; + $p < 0.10$, based on a chi-square test.

In contrast to the apparent differences in the perceptual patterns found between managerial ranks in 2012, the opinions revealed by the university management in 2005 generally demonstrate a less clear pattern of variations among presidents, deans, and chairpersons with regard to both the functional roles currently played by their institutions as well as roles to be played in the future. This, however, may be explained by the fact that the corporatization of the national universities took place in 2004, which granted each of these institutions greater autonomy with enlarged authority of university presidents and boards. Corporatization of national universities was accompanied by the reduction of governmental funding, but this tightening policy has also cut governmental aids to the private sector. As a result, competition for external funding sources among all types of institutions has accelerated, affecting both public and private universities. Stronger leadership and sense of responsibility as manifested by presidents in 2012 perhaps was not fully incubated at the time of the 2005 survey. Nonetheless, the hierarchical structure of affirmative perceptions found among the managerial ranks in 2012 imply that the steering of organizations within each university has come to take a more top-down flow of leadership with university presidents' positive sense of accomplishment and aspirations as the driving force for gaining its headway. In other words, the effect of the empowered authority of Japanese university presidents has perhaps come to the surface more tangibly relative to that of deans and chairpersons in recent years, as delegating agents to implement the central government policies.

4.3. Perceptions of Japanese University Executives by Academic Discipline

The formation of self-image or identity of an individual institution may be affected by personal vision and mission assumed by the incumbent executives possessing different academic training and career experiences. Table 4 shows the cross-tabulation of the perceptions of Japanese university executives with regard to the academic priorities to be emphasized in the future and their academic training, calculated using the 2012 survey. The cells with proportions, which are greater than the proportions obtained for the full data, *i.e.*, as shown in Table 2, are highlighted in Table 4.

It is clear that the “global” missions are emphasized by Japanese university executives, particularly with academic training in natural sciences, engineering, and medicine, dentistry, and pharmacy, while the management with academic training in arts and humanities, social sciences, and education tend to place their emphasis on comprehensive education aimed at cultivating a broad skill set, as well as cultivating the arts and athletics. Moreover, a larger proportion of university executives with academic background in arts and humanities, social sciences, education, medicine, dentistry, and pharmacy, emphasize the mission of becoming a local education base (*i.e.*, educating students who will contribute to the needs of the local communities) than those with academic training in natural sciences and engineering. The training in engineering also leads to greater emphasis on industry-academia collaboration than other disciplines.

Table 4 underscores that the academic priorities to be emphasized as a university is viewed differently and that the university management with different academic attributes assume different aspects of institutional roles. The finding suggests the possibility that the mission and university identity may be affected by the incumbents and therefore inconsistently inherited over time as their positions are taken over by their successors. The result also implies potential complexity in the decision making processes on various institutional matters among the management which consists of

individuals with different academic backgrounds, as diverse and possibly conflicting perceptions coexist internally with regard to the institutional priorities to be emphasized, according more or less to the discipline of their academic training.

Table 4. Proportions of Japanese university executives acknowledging the listed academic priorities with positive perceptions, by academic discipline in 2012.

Institutional priority	Arts & humanities	Social Sciences	Education	Natural Sciences	Engineering	Medicine, dentistry, & pharmacy
Becoming a global research base	23.6	21.6	23.2	43.8	37.7	36.9 ***
Becoming a global education base	25.1	25.5	25.3	36.4	33.2	31.9 *
Becoming a local research base	64.2	66.6	75.0	61.0	68.0	77.4 ***
Becoming a local education base	78.5	77.1	90.9	59.2	59.5	77.4 ***
Cultivating a highly skilled workforce	53.2	56.8	74.7	67.4	63.5	88.0 ***
Cultivating a broad skill set	72.6	69.6	53.1	55.1	50.8	52.4 ***
Comprehensive and general education	71.2	58.5	40.6	47.9	29.9	40.9 ***
Cultivating the arts and athletics	23.7	18.5	36.1	14.2	13.1	11.4 ***
Industry-academia collaboration	40.1	55.1	36.1	56.2	76.4	64.4 ***
International exchange	70.1	65.1	51.5	65.4	64.9	66.7 **

The differences among the academic disciplines are found statistically significant at *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; + $p < 0.10$, based on a chi-square test.

5. Statistical Analysis

Contrary to the recent efforts by the central government in internationalizing domestic universities, the descriptive analysis presented in the previous section suggests that Japanese university executives who assessed their institutions as a global hub of research and teaching do not constitute a large proportion of the sample. Although nearly one third of the university executives in the sample acknowledge such a global mission as an important future agenda, Table 2 shows that the global mindset is not as widely permeated among Japanese university executives as their senses of responsibility for serving the local needs in research and teaching, for which more than two thirds positively responded as important missions to be fulfilled in the future. Moreover, the goal of becoming a global academic base was not an urgently pursued agenda between 2005 and 2012, with only a negligible increase in the affirmative perceptions found between the survey years, *i.e.*, from 8.2 percent in 2005 to 9.2 percent in 2012 for the priority of “becoming a global education base” and even a decrease from 12.2 percent in 2005 to 11.3 percent in 2012 for “becoming a global research base”.

In order to ensure consistency with the effort by the central government in internationalizing domestic universities, as well as to achieve the policy goal in parallel with meeting the local needs at the same speed, the perceptions of Japanese university executives on the importance of establishing a global academic status are statistically analyzed in this section, with particular interest in what factors contribute to forming such individual perceptions. As explained in the description of the data sets, the

questionnaire inquired whether each respondent considers his or her institution as having established as “a global research base” as well as “a global education base”, rating their perceptions based on the three-point scale (*i.e.*, 1 = “not implemented/achieved at all”; 2 = “implemented/achieved in some measure”; and 3 = “already implemented/achieved”). The scores from both questions are combined so that the distribution of the new scores range from 2 (*i.e.*, a respondent answered negatively to both questions) to 6 (*i.e.*, a respondent answered positively to both questions). The consolidated score is intended to measure the extent to which each university manager acknowledges his or her institution to have successfully attained the recognition as a “global knowledge base”, rather than analyzing their sense of institutional performance in research and teaching separately [39]. The score is then used as a dependent variable in a multiple regression analysis to investigate the determinants of individual perceptions [40]. The questionnaire also asked the sample of Japanese university executives about their aspirations for creating a globally renowned institution of research and teaching, rating their perceptions with a similar three-point assessment (*i.e.*, 1 = “should/will not be emphasized”; 2 = “should/will be emphasized in some measure”; 3 = “should/will be emphasized”). The consolidated score obtained from the self-assessment results on research and teaching attempts to measure the degree of emphasis by the university executives on winning a global accolade as an academic institution in the future. The detailed estimation result is provided in the Table A1, and only the main findings specifically pertaining to the current topic are discussed in this section.

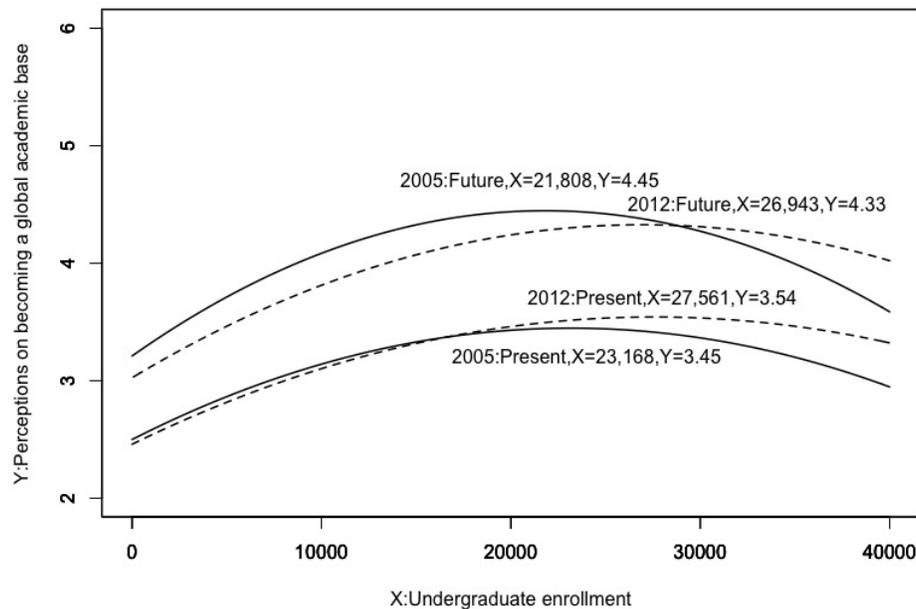
After controlling multiple factors simultaneously, our statistical analysis result suggests that Japanese university presidents are likely to assess more affirmatively than deans and chairpersons in both survey years, with regard to the academic roles being fulfilled globally by the institution at present as well as the global mission to be performed in the future [41]. A statistically significant variation is also obtained between academic disciplines of the respondents, a finding which is consistent with the discussion developed along with the descriptive result presented in Table 4.

The academic priority of gaining global recognition is often emphasized by large-scale institutions that are typically endowed with sufficient funds. Geiger [42] notes that the largest institutions of higher education are also often perceived as the best, and that throughout the history of American universities and colleges, this is “especially true following the academic revolution, when scale was imperative for covering the disciplinary curriculum and offering doctoral studies”. Our regression result finds that such a global-oriented mindset in Japan rises with the number of undergraduate students, while the graduate enrollment *per se* shows no significant impact on the self-rating by university executives on having successfully achieved a global reputation in research and teaching (see Table A1).

As depicted in Figure 1, the self-assessment on the current status in fulfilling the goal of globalization in research and teaching is estimated to reach its peak at institutions with undergraduate enrollment of 23,168 students in 2005, whereas the peak of positive rating is reached at a larger scale of universities, *i.e.*, 27,561 undergraduate students in 2012. There exist ten universities found within the proximity of these undergraduate enrollment scales, *e.g.*, within the range of 20,000 and 30,000 students in both the 2005 and 2012 data sets, all of which are private institutions in both survey years [43]. It is noteworthy that the positive self-rating on having reached the global academic status is estimated higher for 2012 than for 2005 in Figure 1, especially for universities with an undergraduate scale of over 20,000 student enrollment, indicating that accomplishing such a goal is perceived to have progressed in relatively large universities between 2005 and 2012. It is also worth noting that the

executive perceptions in Figure 1 gradually decelerate with undergraduate enrollment. This suggests that a larger population of undergraduate students does not necessarily build positive self-image of an institution at a constant incremental rate, and that mammoth institutions are perhaps rather perceived internally as an indication of excessively popularized universities, which may hinder achieving the ambitious goal of becoming a global academic center.

Figure 1. Self-assessment of Japanese university executives on becoming a global knowledge base and undergraduate enrollment.



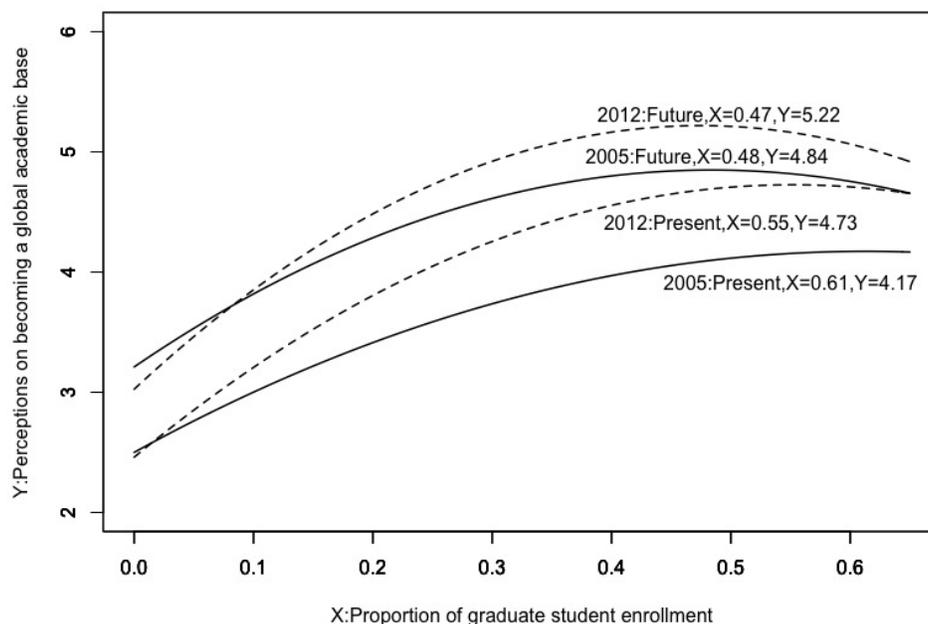
A similarly concave trend is found for the aspirations of Japanese university executives in implementing global academic roles in the future. That is, the global orientation increases with the undergraduate enrollment at a decelerating rate, reaching the peak at universities of a scale with 21,808 undergraduate students in 2005 and 26,943 students in 2012. The set of estimated curves for future aspirations lying above the curves drawn for the assessment of the current status in Figure 1 certainly point to the desire of Japanese university management for improved visibility in the global arena. However, the fact that the aspiration-enrollment profiles shifted downward between 2005 and 2012, particularly for universities with less than approximately 25,000 undergraduate enrollment, suggests that achieving the goal of becoming a globally competitive academic center is perceived by most Japanese university executives to have become a more arduous task to fulfill in 2012 than in 2005, while maintaining the same scale of undergraduate enrollment. Nonetheless, the figure provides visible evidence that the global orientation among Japanese university management rises with the undergraduate enrollment size, all other factors being held constant, while such perceptions gradually slow down with the enrollment size. In addition, the management in large-scale universities was more affirmative with their achievement in 2012 than was in 2005 and tends to take a more proactive stance in joining the current of globalization.

Although the number of graduate students *per se* has no significant influence on the perceptions of Japanese university executives on the idea of building a globally competitive institution, the individual

perception is consistently affected by the proportion of graduate students enrolled in their universities (see Table A1 for the estimation result). Figure 2 presents the estimated relationship between the executive perceptions on globalization of their institutions and the proportion of graduate students enrolled, based on the 2005 and 2012 surveys.

Figure 2 clearly demonstrates that the executive assessment on the current institutional performance in gaining global competitiveness improves with the proportion of graduate students, although raising the proportion does not necessarily improve their perception at a constant rate and rather increases at a decelerating rate. The estimated profiles in Figure 2 also show that the affirmative perceptions on having acquired greater respect in the global community rose consistently at all proportions of graduate student enrollment between 2005 and 2012. The perceptions of Japanese university executives with regard to their emphasis on gaining global recognition in the future also rises with the proportion of graduate students enrolled. Again, the affirmative perception by the university executives is estimated to gradually slow down, however, reaching the peak of such perceptions at universities with 48 percent of graduate student enrollment in 2005 and 47 percent in 2012. There exist eight universities in the proximity of these graduate proportions in our data sets, e.g., between 42 and 53 percent in 2005, and seven universities found between 42 and 52 percent in 2012, all of which are national universities [44].

Figure 2. Self-assessment of Japanese university executives on becoming a global knowledge base and the proportion of graduate students.



A cluster of institutions found in the high range of graduate proportions in our data sets consists of the former imperial universities and other premier institutions with high prestige, which are all identified as historically privileged national universities. In contrast, presidents, deans, and chairpersons in universities with a graduate enrollment of seven percent (at which the two profiles intersect) or below are those whose perceptions reversed from once global oriented in 2005 to a lesser extent so in 2012. Typically, the group of universities with a graduate enrollment of less than 10

percent includes provincial national universities with lesser prestige than the former imperial and a few other premier national universities. The majority of private institutions are also characterized with low proportions of graduate student enrollment.

In comparison with a U.S. study, which collected a sample of institutions with at least \$40 million in federal research expenditures in fiscal year 2009 [45], all 25 institutions with the highest proportions of graduate enrollment boasted at least 40 percent of the graduate enrollment. The highest proportions of graduate students was found at Johns Hopkins University's 71.4 percent, followed by Columbia University (68.0 percent) and University of Chicago (66.1 percent), and the lowest among the 25 US institutions was found at Boston University's 42.8 percent, at which global aspiration among university managers nearly maxes out in Japan. The US-Japan discrepancy points to the difficulty for Japanese universities, which have evolved by transforming from the older European-type universities and modeled after the U.S. system of higher education in the post-war era [14], to pursue globalization in research and teaching by simply imitating the U.S. model of enlarged graduate programs.

Nonetheless, the findings suggest that an expansion of graduate student enrollment relative to undergraduate enrollment, *c.f.* not the actual number of graduate students enrolled *per se*, contributes to building positive perceptions both in the current assessment as well as in the projection of future. Executives with stronger emphasis on globalization also increased between 2005 and 2012, particularly in universities with a graduate enrollment proportion of roughly seven percent and above, as represented by the upward shift of the estimated profile within this range of graduate proportions in Figure 2. In contrast, global orientation declined among the university management with smaller graduate divisions, which implies that the provincial national universities as well as the majority of private universities that are typically found within this lower range of graduate proportions, likely opted out of severe competitions for the world-class universities between 2005 and 2012.

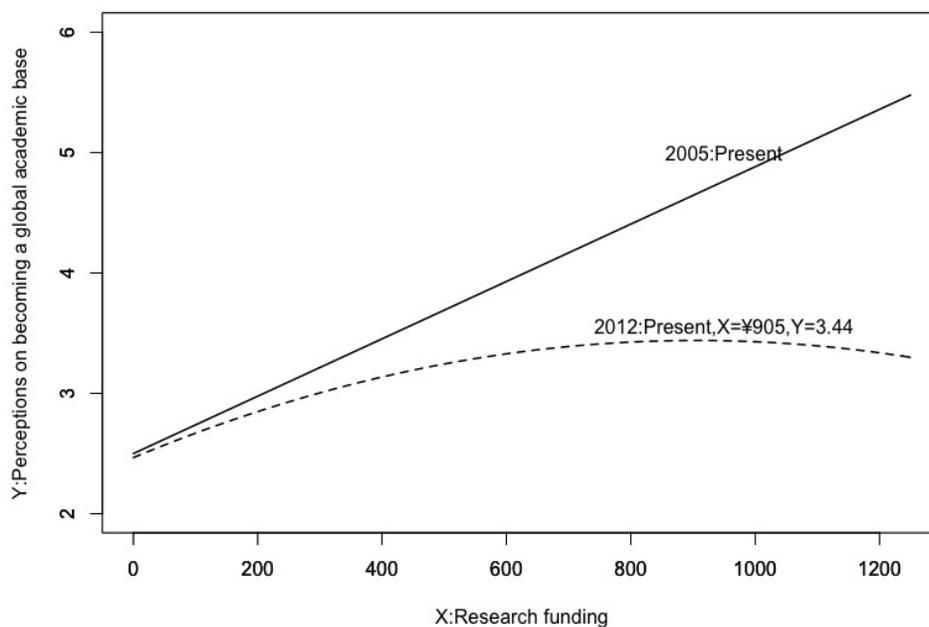
Finally, the relationship between the amount of research funding acquired by institutions and the perceptions of the university management is examined, with regard to pursuing the ambition of building a global knowledge base. It may be reasoned that universities granted with a large amount of research funding naturally internalize the roles of leading academic research and gaining a competitive edge in the global marketplace of higher education. The regression result (see Table A1) shows that the total amount of research grants awarded positively affects the perceptions of Japanese university executives on accomplishing the global mission for both the 2005 and 2012, at all levels of research funding.

Figure 3 portrays that the amount of external research funding awarded raises the executive affirmation on the status of progress in establishing globalized universities, at a constant incremental rate for 2005 and with a decelerating rate of increment for 2012. That is, the positive self-assessment by the executives is estimated to increase linearly for 2005, while it reaches the ceiling at universities awarded with 9050 million yen (\approx 88.7 million U.S. dollars) for 2012 [46]. Again, the 2012 profile estimated below the profile for 2005 in Figure 3 underscores that the positive assessment by Japanese university executives on having attained the global reputation declined between these survey years.

Perhaps more importantly, Figure 3 shows that the total amount of acquired research funding in 2012 would not yield positive individual perceptions to the similar extent it did in 2005. That is, managers in universities awarded with the same amount of external research funding in both years responded more passively in 2012 than did in 2005, at all levels of acquired research funds. The

widening gap between 2005 and 2012 was particularly notable for universities awarded with larger amounts of research funding. The result perhaps mirrors the sentiment of Japanese university leaders with extremely limited resources, finding themselves in an increasingly competitive environment of globalizing higher education which takes a growing amount of research money each year, in order to stand out and lead in the race to become a world-class university. Therefore, a view that “great universities based on this research-intensive model can rise rapidly anywhere in the world” [47] may be true, but perhaps more so for American universities with enormous endowments, at least in the eyes of Japanese university leaders.

Figure 3. Self-assessment of Japanese university executives on becoming a global academic base and the total amount of research funding.



6. Conclusions

Japanese colleges and universities, regardless of the establishment type, *i.e.*, national, prefectural/municipal, or private, face commonly perceived challenges today, due to exogenous factors directly related to a dramatically transforming composition of demography and borderless environment, ranging from a rapidly shrinking 18-year-old bracket population to retirement of the babyboomer generation, to increasing demand from the international as well as domestic and local communities to serve their manifold and diverse needs. This paper empirically examined whether and to what extent Japanese university executives affirmatively acknowledge (or not) the performance of their institutions in fulfilling multiple functional roles assumed and what traits contribute to shaping such self-identity.

The affirmative perceptions among Japanese university management with regard to the current institutional performance, as well as functional roles to be played in the future, increase with the managerial rank which suggests at least perceptually a growing involvement of university presidents in taking institutional leadership, particularly in more recent years, than the period immediately following

the corporatization of national universities which took place in 2004. However, our finding also implies that the institutional mission and academic priorities assumed by university management may frequently alter over time as succeeding executives with different academic disciplines reveal different emphases on institutional roles and steer the institution.

A statistical analysis also finds that affirmative self-assessment by Japanese university executives on a globalizing effort is made according to their institutional size, *i.e.*, the number of undergraduate students and the proportion of graduate enrollment. Dramatic restructuring has been made over the last 20 years in some of the largest research universities in Japan, shifting their academic focus from undergraduate to graduate education with a particular emphasis on cultivating a highly skilled workforce who can play a leading role in rapidly globalizing environments. As a result, the number of their graduate students increased tremendously [48]. However, our finding underscores the continuing comparative advantage of the premier national universities, often awarded with substantial funding and subsidies from the government, and enrolling higher percentages of graduate students than the lesser prestigious, undergraduate-dominant, provincial national universities and private counterparts. The result rather implies a reversed effect on global-orientation for these discouraged provincial national universities and small-scale private institutions between 2005 and 2012. Considering that the corporatization of national universities came into effect in 2004 which awakened the domestic universities by exposing them to increased competition with a number of large-scale project-based funds injected by the central government, the policy goal of “internationalization” and “joining the global community” perhaps seemed attractive to the eyes of yet naïve Japanese universities until many began to realize that reaching such a goal is not an easy task, as the “reality” emerged by 2012.

Finally, our result suggests that the recent Japanese government policy to internationalize domestic universities may not be consistently pursued with an indefinite expansion of the proportion of graduate enrollment at all institutions of higher education due to its decelerating effect. This seems contrary to the case found among some influential US research universities that acquired highly recognized status worldwide, with much greater proportion of graduate enrollment. Mohrman [20], however, in her reference to China’s recent efforts in striving for international standing with the 211 and 985 Projects which concentrate resources on a handful of institutions, reminds us of the importance of respecting our own traditional strengths by accepting the lack of “the centuries’ long history of Western universities.” She further comments that it would be “quite interesting to learn of a new definition of a world-class university that is not simply an imitation of Harvard but a creative blend of the best of East and West.” Vest [4] also discusses that “our research universities weave together teaching and research in ways that bring freshness, intensity, and renewal to both activities.” Japanese university leaders perhaps need to take heed of these voices and make their own optimal choices in finding their functional roles and missions, in order to establish their sound identity rather than imitating the borrowed image from foreign ideas and institutions.

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Author Contributions

All authors contributed equally to the research on this paper. Hata were primarily responsible for conducting the 2005 and 2012 surveys and collecting the necessary data used for the analysis, and Murasawa also contributed to the 2012 survey project. Murasawa and Watanabe were responsible for designing the research and conducting statistical analyses. Finally, Watanabe took on the responsibilities of writing up the paper. All authors read and approved the final manuscript.

Appendix

Table A1. Determinants of rating with positive perceptions on becoming a global academic base.

Variables	2005				2012			
	Present		Future		Present		Future	
	<i>B</i>	S.E.	β	S.E.	<i>B</i>	S.E.	β	S.E.
Fixed effects:								
Constant	2.499	0.160 ***	3.210	0.198 ***	2.459	0.146 ***	3.024	0.188 ***
<i>Establishment type:</i>								
National	-		-		-		-	
Local	-0.132	0.128	-0.070	0.155	-0.066	0.110	0.090	0.148
Private	0.071	0.120	0.117	0.149	0.224	0.112 ***	0.036	0.148 *
<i>Managerial rank:</i>								
President	-		-		-		-	
Dean	-0.242	0.079 ***	-0.203	0.094 *	-0.237	0.073 **	-0.234	0.084 **
Department chair	-0.200	0.072 **	-0.225	0.085 **	-0.295	0.066 ***	-0.319	0.063 ***
# undergraduate students	0.008	0.002 **	0.011	0.003 ***	0.008	0.002 ***	0.010	0.003 **
# undergraduate students squared	-0.018	0.007 *	-0.026	0.009 **	-0.014	0.005 **	-0.018	0.007 *
# graduate students	-0.005	0.016	-0.007	0.020	-0.030	0.014 *	-0.019	0.019
# graduate students squared	-0.000	0.002	0.000	0.002	0.003	0.001 *	-0.001	0.002
# undergraduate departments	-0.058	0.045	-.096 +	0.054	-0.034	0.026	-0.020	0.035
# undergraduate departments squared	0.001	0.003	0.004	0.004	0.001	0.001	0.000	0.002
Deviation value for undergraduate admissions selectivity (<i>hensachi</i>)	0.011	0.004 **	0.029	0.005 ***	0.006	0.008	0.022	0.010 *
Deviation value for undergraduate admissions selectivity (<i>hensachi</i>) squared	0.000	0.000 *	0.000	0.000	0.001	0.001	0.001	0.001
% graduate students	5.455	1.432 ***		1.736 ***	8.217	1.268 ***	9.242	1.658 ***
% graduate students squared	-4.447	2.713 +	-6.997	3.247 *	-7.447	2.445 **	-9.737	3.245 ***

Table A1. Cont.

Variables	2005				2012			
	Present		Future		Present		Future	
	B	S.E.	β	S.E.	B	S.E.	β	S.E.
Research funding (in JPY10M)	0.002	0.001 **	0.001	0.001	0.002	0.001 ***	0.001	0.001
Research funding (in JPY10M) ²	-0.000	0.000	-0.000	0.000	-0.000	0.000 **	-0.000	0.000
Random effects:								
σ prefecture	0.013 ***		0.116 ***		0.087 *		0.128 *	
σ university	0.287 ***		0.349 ***		0.236 ***		0.435 ***	
σ discipline	0.029 ***		0.126 ***		0.088 ***		0.107 ***	
σ individual	0.954		1.097		0.955		1.079	
Quasi-R square	0.169		0.155		0.144		0.124	
# prefectures	47		47		47		47	
# universities	471		468		534		536	
# disciplines	10		10		10		10	
Sample size	1929		1877		2191		2155	

Note: "S.E." indicates "standard error". Significant at *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; + $p < 0.10$.

Conflicts of Interest

The authors declare no conflict of interest.

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40. More specifically, a type of linear regression model called “linear mixed model (LLM)” is conducted to examine the determinants of the university executive perceptions.
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