

Admissions Quotas in Metropolitan Areas and Competition between Universities in Korea

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The excessive demand for universities in metropolitan areas as a result of location premiums and regulated admissions quotas diminishes the competition between universities and the incentive to enhance educational performance to attract more students. Cases in point are the lower graduate employment rates (a measure of educational performance) of universities in metropolitan areas compared to those in non-metropolitan areas despite higher quality students. Additionally, the graduate employment rates of non-metropolitan universities are influenced by educational input factors such as an increase in the percentage of courses taught by full-time faculty, while those of metropolitan universities are contingent merely on enrollees' entrance scores. Ergo, a structure that revitalizes the competition between universities and encourages them to improve their educational services must be established in order to enhance the quality of higher education.

Key Word: Admission Quotas, Disincentives to Compete,
University Restructuring
JEL Code: I23, I28

I. Introduction

In 1996, the Korean government adopted a normative system of institutional establishment with the goals of authorizing the establishment of a university upon the satisfaction of predetermined requirements and of recognizing its legal personality status simply through registration without additional administrative procedures such as government approval or permission — termed a ‘normative system’ in this paper. Since the adoption of the system, universities in Korea have expanded rapidly in size. However, this has been under fire in that quality improvements in education have not been guaranteed. The quantitative expansion of higher education clearly has positive outcomes, such as mass accessibility and

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equal opportunities in higher education, but these are by far outnumbered by the negative consequences, mainly more underperforming universities that fail to recruit enough faculty members and students to fulfill their capacities, according to critics. Social costs incurred by these underperformers lingering in the market are considered to be significant. Furthermore, looming changes in Korea's demographic structure are expected to accelerate the decline in the school-age population, likely leaving many universities with difficulties in recruiting enough students to stay afloat by around 2030.

In its master plan for the development of higher education released in August of 2013, the Ministry of Education announced the abolition of the normative system, entering into effect in 2014, meaning that the establishment of universities will become more difficult. This plan, however, would not help at all to solve the ongoing problems of underperforming universities. As the school-age population decreases, the number of prospective undergraduates is as well on the decline as well, allowing a projection of the excess supply of higher education. For example, given that private universities accounting for 80 percent of all higher education institutions rely mainly on student tuition payments to operate, if current conditions persist, there will be more underperforming universities as a result of the decline in the number of students.

The Korean government now faces two challenges: to enhance the competitiveness of universities and to cope with the decline in the school-age population. It would be reasonable to view these two issues as not mutually exclusive and to consider that they could be explored simultaneously. As an example, consider three universities, A, B and C, each able to admit one hundred students, in a society with a school-age population of three hundred. Assuming no increase in their admissions capacities, a rise in the school-age population would result in fierce competition among students, but none among these universities because regardless of their academic achievements, it is simply impossible to attract more students. On the other hand, assuming that the school-age population decreases by Δ per year from three hundred, this would cause the universities to compete for students. In this regard, unlike an increase in the school-age population, a decrease would introduce the natural pressure of competition among universities, implying that efforts to resolve the decrease in the school-age population, as long as they do not hinder competition among universities, would be compatible with the policy goal of strengthening their competitiveness. More fundamental methods to enhance competitiveness are needed, as the competition pressure brought by the decline in the school-age population may be short-lived.

Government policies affecting higher education have thus far focused on control through fiscal support using multi-faceted regulations. This has partly contributed to complacency by universities, leaning towards satisfaction with the given conditions instead of taking a leap forward. Therefore, this study seeks measures to enhance the competitiveness of Korean universities and to respond to the decline in the school-age population. To this end, this paper initially outlines academic achievements by Korean universities and then reviews two fundamental regulations pertaining to Korean universities: university establishment regulations in the capital area, and the normative system currently in place. The findings on Korean universities are then analyzed in an effort to examine their implications and to

consider the possibility of the adoption of quasi-market competition. In particular, this paper makes assumptions about the academic achievements by universities in the capital and in non-capital areas and tests them, based on which it intends to analyze problems of current university restructuring policies and then suggest solutions.

II. Current Status of Korean Universities

A. Higher Education Achievements

What it takes for Korea to be at the center of the Asian economy and culture overall is talented human capital with creative and innovative minds and with the capabilities to realize value-added results in knowledge-intensive sectors. Over the past fifty years, universities in Korea have grown substantially in terms of size, but not in terms of their global competitiveness. According to the IMD's World Competitiveness Yearbook for 2013, Korea ranks twenty-fifth in educational competitiveness out of sixty nations, following Sweden (1st), Denmark (2nd), Israel (11th) and Taiwan (21st), as shown in Table 1.

Meanwhile, approximately 2.6 persons per 1,000 Koreans are now studying abroad for higher education, placing Korea at eleventh on this list. On the other hand, Korea ranks among the lowest (41st) in terms of university education; its highest ranking in this category was thirty-ninth out of 59 nations in 2011, changing only slightly since 2009. Despite its high rate of university enrollment, Korean universities show low employment rates for graduates and only modest educational achievements. Hence, it is necessary to determine the fundamental reasons for the current conditions and to develop measures which will lead to institutional improvements.

Table 1 shows Korea that ranks approximately fiftieth in terms of the number of students per teacher at primary and secondary schools, at 20 and 18 students, respectively, whereas it is typically eighth to tenth in terms of the secondary school enrollment rate, which stands at 96 percent. Korean students typically rank fourth or fifth in math and science on the PISA test. These outstanding achievements can be understood as the outcome of parents' much larger investments in private education compared to the levels of public investment in primary and secondary education. Also, Korea ranks second in terms of the higher education completion rate for the population aged 25~34, at 65 percent. On the other hand, as of 2013, Korea ranks twenty-seventh, forty-first and forty-first again in terms of educational system, university education, and management education, thus showing backwardness. The simultaneous presence of a large number of Korean students studying abroad and the low level of university education together imply that it is the low quality of domestic university education that motivates many students to choose to study abroad.

Korea's gross tertiary enrollment rate¹ is among the highest, as shown in Table 2,

¹Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown, tertiary education, according to the UNESCO Institute

TABLE 1— CHANGES IN KOREA'S EDUCATION COMPETITIVENESS BY SUB-INDEX (2009~13):
RANKINGS AND SCORES

Detailed indicators of education competitiveness		2009	2010	2011	2012	2013	
Korea's ranking/Number of participating nations		36/57	35/58	29/59	31/59	25/60	
Quantity	1. Education-related public spending as a percentage of GDP (%)	36 (4.2)	36 (4.2)	33 (4.6)	31 (4.6)	32 (4.63)	
	2. Education-related public expenditure per person US\$ ¹⁾	27 (831)	29 (916)	32 (793)	31 (785)	33 (785)	
	3. Number of students per teacher in elementary schools (umber)	51 (26.7)	51 (25.6)	51 (24.1)	50 (22.4)	51 (20.9)	
	4. Number of students per teacher in secondary schools (umber)	50 (18.0)	51 (18.1)	53 (18.2)	53 (18.0)	52 (17.6)	
	5. Secondary school enrollment rate (%)	6 (96.1)	8 (96.5)	6 (98.0)	8 (95.7)	10 (96.0)	
	6. Higher education completion rate for the population aged 25~34 (%)	4 (53.0)	2 (56.0)	2 (58.0)	2 (63.0)	2 (65.0)	
	7. Number of foreign students studying in higher education in Korea per 1,000 population (number)	37 (0.46)	34 (0.66)	33 (0.83)	34 (1.02)	32 (1.20)	
	8. Number of Korean students studying abroad for higher education per 1,000 population ¹⁾ (number)	10 (2.11)	11 (2.17)	11 (2.32)	11 (2.54)	11 (2.56)	
		Total	4	4	5	5	5
	9. Scholastic achievement ^{2), 3)}	Math (PISA score)	4 (547)	4 (547)	4 (546)	4 (546)	4 (546)
		Science (PISA score)	10 (522)	10 (522)	6 (538)	6 (538)	6 (538)
10. English proficiency (TOEFL score) ^{2), 4)}		48 (77)	48 (78)	46 (81)	46 (81)	46 (82)	
11. Illiteracy rate of population aged 15 and older (%)		32 (2.0)	32 (1.7)	33 (1.7)	34 (1.7)	34 (1.7)	
Quality	12. Educational system	32 (4.38)	31 (5.03)	20 (6.00)	27 (5.58)	27 (5.71)	
	13. Science education ⁵⁾	-	32 (4.96)	20 (5.37)	37 (4.57)	23 (5.32)	
	14. University education	51 (3.95)	46 (4.28)	39 (5.00)	42 (4.57)	41 (4.93)	
	15. Management education	42 (4.52)	43 (4.70)	35 (5.41)	43 (4.95)	41 (5.19)	
	16. Linguistic ability	34 (4.88)	39 (4.98)	31 (5.60)	32 (5.59)	28 (5.88)	

Note: 1) Not used for the ranking calculation; this is only reference information used to check the backgrounds of the subject nations. 2) Used as background information until 2008. Incorporated into the quantitative index from 2009 to 2012 and then categorized as background information from 2013. The rankings and scores are based on the IMD World Competitiveness Yearbook and are therefore partly inconsistent with those published in PISA 2009. 3) Scores from 2009 to 2010 come from PISA 2006, and those from 2011 to 2013 come from PISA 2009. 4) The TOEFL test changed from CBT (scores of 0~300) to iBT (scores of 0~120); hence, the rankings from 2009 are calculated based on the iBT. A score of 218 on the CBT scale is equivalent to a score of 81~82 on the iBT scale. 5) One of the sub-indices of the science infrastructure before 2010, when it was incorporated into the sub-indices for education competitiveness 6) * -: Scores and rankings are not released. Figures in * () are indicator values.

Source: IMD World Competitiveness Yearbook (Various years). Recitation of the KEDI (2013).

TABLE 2—WEF'S EDUCATION RANKINGS

(UNIT: RANK)

Category		2009	2010	2011	2012	2013
Higher education and vocational training	Total higher education enrollment rate	1	1	1	1	1
	Quality of the educational system	47	57	55	44	64
	Quality of universities /graduate schools of business	44	47	50	42	56
Corporate innovation	University-industry research collaboration	24	23	25	25	26

Note: 1) The number of surveyed nations varies, with 133 in 2009, 139 in 2010, 142 in 2011, 144 in 2012 and 148 in 2013. 2) According to the WEF's 2013 report on the secondary enrollment rate, Korea ranked 27th among 148 nations as of 2010.

Source: World Economic Forum (Various years).

TABLE 3—PROPORTION OF ENROLLED STUDENTS BY UNIVERSITY TYPE (2011)

(UNIT: %)

Category	Public	Government-dependent private	Independent/Private
Australia	96		4
Austria	84	13	3
Finland	74	26	
France	86	5	9
Germany	96	4	
Italy	90		10
Japan	25		75
South Korea	23		77
Mexico	67		33
Norway	85	5	10
Poland	90		10
Spain	88		12
Switzerland	93	7	
Turkey	94		6
UK		100	
US	70		30

Source: OECD (2013).

whereas the quality levels of its educational system and its management courses at universities and graduate schools are among the lowest (44th~64th and 42nd~56th, respectively). In the category of university-industry research collaboration, Korea ranks twenty-third to twenty-sixth and therefore shows a low level in this regard considering its economic power.

Contrary to the popular belief that the private sector-led supply of higher education would result an undersupply due to external effects, private universities outnumber national and public universities by almost fourfold in Korea, as shown in Table 3. In most nations, public universities account for 70~90 percent of all universities, with the exception of Korea and Japan, where only 23 percent and 25 percent, respectively, are publicly operated.

TABLE 4—EMPLOYMENT RATES BY AREA, STUDY FIELD, UNIVERSITY TYPE AND GENDER (2012)

(UNIT: %)

Category	Total			National/Public			Private		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	56.2	60.1	52.1	53.4	59.1	45.5	56.9	60.4	53.5
Subtotal	56.7	62.8	50.9	59.7	64.5	51.9	56.5	62.6	50.8
Humanities	50.0	55.2	47.9	51.0	52.9	49.6	50.0	56.3	47.8
Social Sciences	56.4	59.0	53.8	62.7	66.6	56.0	56.0	58.4	53.7
Education	45.9	44.1	46.7	47.3	47.3	47.3	45.8	43.7	46.7
Capital area	71.0	73.4	62.8	70.2	72.6	61.0	71.0	73.5	62.9
Natural Sciences	51.1	55.7	48.2	51.7	54.5	48.4	51.0	56.8	48.2
Medical Sciences & Pharmacy	75.8	81.3	73.1	84.2	88.7	79.8	75.4	80.7	72.9
Arts & Physical Education	39.1	43.2	37.2	42.3	49.2	35.4	38.9	42.5	37.3
Subtotal	55.8	58.5	52.9	52.7	58.4	44.8	57.2	58.5	55.9
Humanities	47.1	48.0	46.6	39.8	43.9	37.8	49.7	49.5	49.8
Social Sciences	53.2	52.8	53.5	48.3	50.4	45.8	54.5	53.6	55.6
Education	50.2	47.4	51.5	32.7	37.3	29.6	60.4	56.8	62.4
Non-capital area	65.4	66.2	61.3	66.9	67.2	59.2	64.9	66.3	63.0
Natural Sciences	52.8	54.9	51.1	50.2	53.8	46.9	55.4	56.1	54.9
Medical Sciences & Pharmacy	73.9	79.2	71.1	66.7	77.8	64.4	74.7	79.5	72.2
Arts & Physical Education	47.7	53.0	44.3	38.3	48.8	33.2	49.3	53.6	46.4

Note: 1) Employment rate (as of 2012) = {employees with workplace-based health insurance + graduates employed on campus + overseas employees + employed persons in farming business/persons eligible for employment} × 100 2) The employed (as of 2012) include those with workplace-based health insurance, graduates employed on campus, overseas employees and persons employed in farming businesses. 3) Graduates employed on campus (as of 2012) refer to those with workplace-based health insurance, as of the date of the survey, who signed a contract exceeding one year with a university foundation or a relevant institution (industry-academic cooperation foundation, university or corporate) and who are paid more than the minimum wage; the annual salary of a person employed at the per-hour minimum wage of 4,580 won (as of 2012) is 957,220 won. 4) Overseas employees refer to those who work for more than 15 hours per week and who have an employment contract which exceeds 91 days. 5) Persons employed in farming businesses refer to those without workplace-based health insurance working in farming businesses as of the date of the survey. 6) Persons eligible for employment (according to the 2012 guideline): Graduates — persons (who are advancing into higher education, undertaking their mandatory military service, unable to work, officially excluded and foreign students) 7) Persons who are unable to work refer to those who are inmates, dead, those who emigrate overseas and those hospitalized for more than six months. 8) Persons who are deemed officially excluded refer to those who are medical aid recipients, graduates with a degree from a religious leader training course, female military officers attending a training course before being officially commissioned, and persons eligible for education courses provided by professional education institutes for aviation workers.

Source: KEDI(Korean Educational Development Institute), Employment Statistics DB.

As shown in Table 4, the employment rate of university graduates is 56.2 percent for the year 2012. It should be noted that these figures may be overestimated, as they include the number of graduates employed on campus. Universities occasionally do this in order to raise the employment rates of their graduates. The employment rate of university graduates in the capital area is 56.7 percent, not very

different from the rate of 55.8 percent in non-capital area. However, the gap between the two widens sharply with regard to the employment rate according to field of study. This implies that universities have made sufficient efforts, such as adjusting the admission capacity of each study field or creating market demand for a particular field of study, even considering the fact that the market demand for different fields of study can vary. For instance, universities may have attempted to raise the total employment rate by expanding the capacity for medical sciences and pharmacy while decreasing capacity for less popular fields of study.

B. Current Regulations

1. Regulations Affecting Capital-Area Universities

Pursuant to the policy intending to control the increasing population in the capital area, the Korean government enacted the Seoul Metropolitan Area Readjustment Planning Act in 1984 and strengthened regulatory policies regarding the establishment and expansion of large-scale enterprises, universities (four-year, in particular) and public institutions. The central government's policy to curb the concentration in the capital area is largely an attempt to discourage behavior itself through the Act and to restructure zones and spaces through readjustment plans. Laws which sought total quantity control over the admissions capacities of universities were adopted in 1994 in order to control the total number of prospective students at universities in the capital area. Given that the Seoul Metropolitan Area Readjustment Planning Act entered into effect in 1984, regulations pertaining to the establishment of universities in the capital area have been guided by the principle of no establishment or expansion of universities, particularly in Seoul, with some exceptions, as shown in Table 5.

The consequences of these regulations are illustrated in Figures 1~4 using data concerning changes in the number of universities and registered students in the capital and non-capital areas.

The number of universities remains constant until 1979 and then shows a sustained increase in non-capital areas starting in 1980. After the adoption of the normative system in 1997, the numbers of universities in Seoul and in the capital area remain relatively stable, whereas for non-capital areas, it continues to rise.

A similar pattern is observed with regard to the number of registered students. The number of undergraduates shows little change until 1979, with a sharp rise in both capital and non-capital areas starting in 1982 with the adoption of the graduation capacity system. After the system was abolished in 1987, the number remains steady until 1996. After the adoption of the normative system in 1997, the numbers of undergraduates in both Seoul and the capital area climb slightly, whereas the numbers of students in non-capital areas increase rapidly.

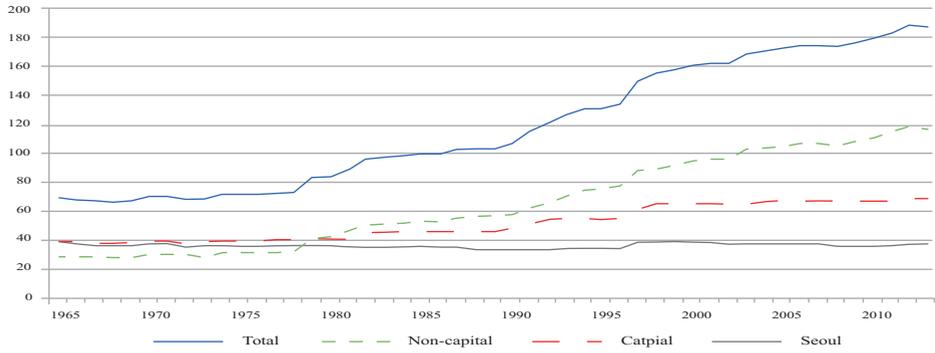
The ratio of universities in the capital to those in non-capital areas remains close to 6:4 until 1979, but it reversed to 4:6 by 2003 as the proportion of universities in the capital region decreased continuously after 1979.

TABLE 5—CHANGES IN SCHOOL REGULATIONS IN THE CAPITAL AREA

Date of revision	Scope of schools	Description of regulations affecting the relocation promotion zone (Seoul)
Oct. 20, 1983	High school and higher education	- Ban on establishing or expanding school and academic courses and raising admissions capacities · Allow the construction of new facilities requested by junior colleges or higher educational institutions within the minimum scope stipulated in the Decree on Standards for School Facilities.
Oct. 10, 1985	Universities, teachers' colleges, colleges of education at universities, air and correspondence colleges, open universities and junior colleges (or various types of schools)	- Ban on establishing or expanding schools and/or raising admissions capacities (except for night courses) · Allow the construction of new facilities requested by junior colleges or higher educational institutions within the minimum scope stipulated in the Decree on Standards for School Facilities. · Allow the construction of new facilities at the Korea Aerospace University.
Dec. 24, 1988	Same as above	- Ban on establishing or expanding schools and raising admissions capacities (except for night courses) · Allow the construction of new facilities requested by junior colleges or higher educational institutions within the minimum scope stipulated in the Decree on Standards for School Facilities.
Dec. 23, 1989	Same as above (except for air and correspondence colleges)	- Ban on establishing or expanding schools and raising admissions capacities (except for night courses) · Allow the construction of new facilities requested by junior colleges or higher educational institutions within the minimum scope stipulated in the Decree on Standards for School Facilities. · Allow the establishment of new religious schools when the head of the Ministry of Education, in consultation with the head of the Ministry of Construction, deem it necessary to foster educators. · Allow the establishment of a junior college in a non-Seoul area.
Dec. 31, 1992	Same as above	(Same as above) - Allow the expansion of admissions capacities in the fields of advanced science and engineering by 1995 (under review). ※ Allow the establishment of small-scale colleges (in zones designated for reserved development and environmental preservation).
Feb. 20, 1993	Same as above	- Allow the establishment of the Korea National University of Arts.
Apr. 30, 1994	Same as above	- Ban on establishing or expanding schools - Allow the establishment of junior and open colleges in non-Seoul areas (under review). - Adopt a total quantity control scheme pertaining to admissions capacities ※ Allow the establishment of small-scale colleges (in zones designated for growth management and environmental preservation)

Source: GRI(Gyeonggi Research Institute) (2008).

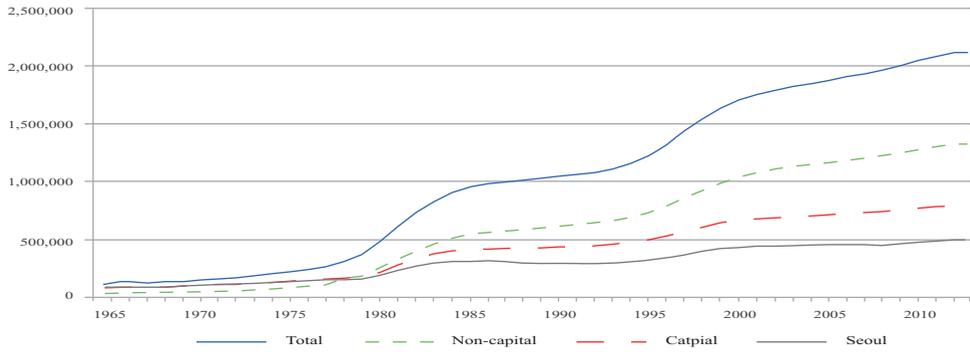
Number of universities



Source: Ministry of Education (1965~2013).

FIGURE 1. NUMBER OF UNIVERSITIES

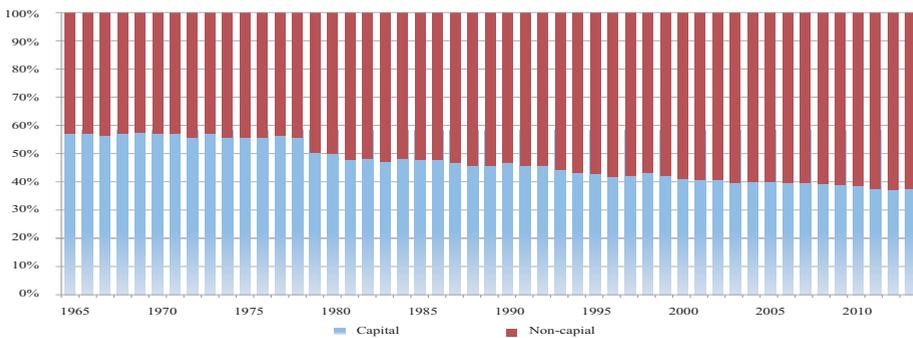
Number of students enrolled



Source: Ministry of Education (1965~2013).

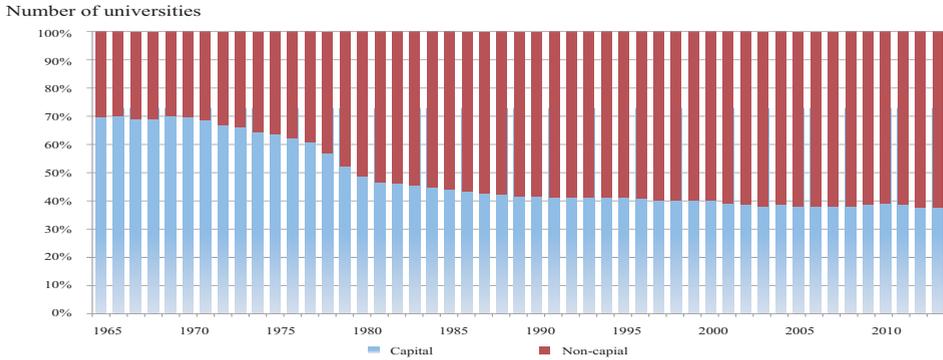
FIGURE 2. NUMBER OF STUDENTS ENROLLED AT UNIVERSITIES

Number of universities



Source: Ministry of Education (1965~2013).

FIGURE 3. NUMBER OF UNIVERSITIES IN THE CAPITAL AND NON-CAPITAL AREAS



Source: Ministry of Education (1965~2013).

FIGURE 4. NUMBER OF ENROLLED STUDENTS IN THE CAPITAL AND NON-CAPITAL AREAS

The ratio of enrolled students in the capital and non-capital areas remains close to 7:3 until 1972, but the gradual decrease in the proportion of those in the capital area reverses the ratio to 4:6, where it has remained since approximately 1990.

2. Normative System of University Establishment

By initiating the May 31st agenda for educational reform in 1995, the government sought to shift the paradigm of Korea's higher education policy. The main goals of this reform encompass the creation of a normative system and university autonomy when setting admissions capacities. Some have been critical, stating that since the reform, Korea's higher education system has grown overly large.

The following summarizes the reform policy for universities (Presidential Committee on Education Innovation, 2006a):

- ① More diversity and speciality: to develop a variety of university models and to adopt a (independent) specialized graduate school system
- ② Autonomy of the university establishment process, admissions capacity and academic operations: normative system and university autonomy for admissions capacity
- ③ Upgrade Korea's academic research to the world's best standards: to upgrade the research at universities to world-class levels, with financial assistance tied to evaluation results
- ④ Globalized education at universities: to foster professionals in international relations and to attract more foreign students and to promote the establishment of overseas campuses

Relaxation of regulation regarding the establishment of universities was embodied into the 'normative system' and the '(independent) specialized graduate

school system' — which runs no bachelor's degree programs — while regulations affecting admissions capacities were phased into a policy of 'autonomy of admissions capacity.'

III. Main Issues

A. Regulations on University Establishment in the Capital Area and Admissions Capacities

Regulations on private universities in the capital area, mainly their admissions capacities and the establishment of these institutions, have made universities more dependent on non-tuition resources, such as financial assistance from the government. In fact, there is little room for universities to make investments in quality educational services. Meanwhile, those in the capital area make no extra efforts to recruit students, as there are no new universities to challenge them.

TABLE 6—STUDENT ENROLLMENT RATE

Category		Observed value	Average	Standard deviation
2011	Non-capital	90	94.33	18.04
	Capital	62	111.25	17.93
2012	Non-capital	91	91.38	25.69
	Capital	62	110.95	23.16
2013	Non-capital	91	95.36	20.80
	Capital	62	112.83	18.74
Three-year total	Non-capital	272	93.69	21.74
	Capital	186	111.67	21.74

Source: Data from the Higher Education in Korea (<http://www.academyinfo.go.kr>), reprocessed.

TABLE 7—GOVERNMENT SUPPORT
(CENTRAL GOVERNMENT + LOCAL AUTHORITY)

Category		Observed value	Average (1m won)	Standard deviation (1m won)
2011	Non-capital	75	7,617	11,671
	Capital	47	16,954	27,963
2012	Non-capital	82	10,834	23,771
	Capital	56	18,381	31,564
2013	Non-capital	80	9,240	13,627
	Capital	52	24,120	51,161
Three-year total	Non-capital	237	9,278	17,336
	Capital	155	19,873	38,284

Source: Data from the Higher Education in Korea (<http://www.academyinfo.go.kr>), reprocessed.

TABLE 8—GOVERNMENT SUPPORT
(CENTRAL GOVERNMENT + LOCAL AUTHORITY,
PER ENROLLED STUDENT (BELOW AND ABOVE CAPACITY))

Category		Observed value	Average (1k won)	Standard deviation (1k won)
2011	Non-capital	75	1,348	3,901
	Capital	47	1,455	1,791
2012	Non-capital	82	2,863	15,352
	Capital	56	1,626	1,982
2013	Non-capital	80	1,794	6,361
	Capital	52	2,113	3,348
Three-year total	Non-capital	237	2,023	9,981
	Capital	155	1,737	2,480

Source: Data from the Higher Education in Korea (<http://www.academyinfo.go.kr>), reprocessed.

TABLE 9—PROPORTION OF GOVERNMENT GRANT FUNDS OUT OF TOTAL SCHOOL REVENUES (%)
(PROPORTION OF GOVERNMENT GRANT FUNDS OUT OF EDUCATIONAL REVENUES)

(UNIT: %)

Classification		Observed value	Average (%)	Standard deviation
2011	Non-capital	91	5.06	3.53
	Capital	62	2.59	1.80
2012	Non-capital	91	5.22	3.86
	Capital	62	2.74	1.80
2013	Non-capital	90	9.95	4.40
	Capital	62	6.99	2.91
Three-year total	Non-capital	272	6.73	4.54
	Capital	186	4.11	3.02

Source: Data from the Higher Education in Korea (<http://www.academyinfo.go.kr>), reprocessed.

Capital-area universities receiving admission applications which exceed their capacities and making no new investment results in little change in university rankings; universities have little incentive to make new efforts or to increase their investments.

Moreover, universities in the capital area are given government support in amounts which are two to three times greater than the support given to universities in non-capital areas. Such a difference in government support, however, is not as large as it first appears given the fact that in terms of per-student support, universities in the capital region are given only 1.2 times more support than those in non-capital areas. This can be interpreted to mean that government support is nearly balanced between universities in the capital and those in non-capital areas.

With regard to private universities in non-capital areas, they cannot compete with their counterparts in the capital area without active investment from a major corporation or foundation. Of course, this does not mean that private universities in non-capital areas have not competed with each other for students. Compared to their counterparts in the capital area, they are not less dependent on non-tuition revenues, leaving them more dependent on financial support from the government.

In addition, because they do not have access to the advantages available in the capital area, they are in a lower position with regard to their university rankings and therefore have difficulty recruiting students and hence excellent faculty members as well. Inevitably, the quality of their educational services cannot reach high levels.

Universities in the capital area are subject to the admission capacity regulation, unlike their counterparts in non-capital areas. When asking whether this regulation resolves the market distortion brought by the location premium by which inefficient universities are sustained without extra effort simply because they are located in the capital area, the answer may in fact be negative, as discussed below.

First, the number of registered students in the capital and non-capital areas has changed little since 1984, when the establishment regulation was adopted Figure 4. The fact that the proportion of registered students in the capital area against those in non-capital areas was decreasing before the adoption of the regulation implies that university autonomy with regard to admission capacity serves to reduce inefficiency. Moreover, few universities in the capital area have been dissolved thus far despite the efforts of the government, implying that the establishment regulation fails to eliminate the underlying market distortion. Second, the establishment regulation has made universities more dependent on governmental fiscal support so as to make up for the decrease in their tuition revenues and engage in inefficient activities such as launching campuses in non-capital areas. Even after setting aside the dependence on government support, several top-ranking private universities in the capital area appear to have obtained a cross-subsidy from their local campuses.

More importantly, the establishment regulation itself seems to have an adverse effect of mitigating competition pressure on capital-area universities, as will be discussed in Chapter 4. Taken all together, it can be said that the underlying inefficiency caused by the location premium cannot be resolved by the government's establishment regulation. Because it causes other inefficiencies, such as reduced competitiveness and cross-subsidies through local campuses, putting an end to this regulation should be considered.

B. University Restructuring Policy

The 2013 master plan for the development of higher education (Oct. 1, 2013) contains the basic directions for university structural reforms and evaluation systems and suggests policy agendas for building the basis to sharpen competitiveness, strengthen industry-academy collaboration and lifelong education, reinforce research capacities, and create innovative university education programs. The Ministry of Education then released the "Action Plan for University Structural Reform" (hereinafter, the action plan) on Jan. 29, 2014, which sought to upgrade the quality of university education and to prepare for a rapid decline in the school-age population. The action plan is mainly designed to carry out performance evaluations of all universities and to determine the reductions in the admissions capacities according to the evaluation results.

The main objective of this plan is to develop a proactive and aggressive reform measure for restructuring so as to enhance the competitiveness of universities by

TABLE 10—CAPACITY REDUCTION TARGETS PER CYCLE (PROVISIONAL)

Evaluation cycle	First cycle (2014~2016)	Second cycle (2017~2019)	Third cycle (2020~2022)
Reduction target	40,000	50,000	70,000
Period (Academic year basis)	2015~2017	2018~2020	2021~2023

Source: Ministry of Education (January 28th, 2014).

significantly reducing the numbers of universities and by upgrading their educational quality levels. All universities, except for those rated as excellent, will be subject to capacity reductions, and new systems for specialized universities and evaluations are to be adopted with legal and institutional foundations for consistent and systemic structural reforms established. Given these basic directions, the action plan includes the following detailed tasks.

First, based on the results of the performance evaluations, capacity reduction plans will be implemented with a target of 40,000 by 2017 and 160,000 in total by 2023, reflecting the number of prospective students after 2014 and the expected increase in the school-age population after 2025. The (provisional) targets pertaining to the amount of the reduction per cycle are shown in Table 10. All universities will be evaluated during every cycle. Based on the evaluation results, all universities except for those rated as excellent will be subject to differentiated capacity reductions, and those rated as excellent will also be encouraged voluntarily to reduce their capacities through government-funded projects, with the ends results (performance outcomes) of the structural reforms reflected in the evaluations of all government-funded projects and detailed methods to enact the structural reforms suggested in the respective project action plans.

Second, a new university evaluation system will be adopted to improve the quality of education. This is primarily intended to expand the qualitative evaluation part in the existing quantitative evaluation in order to develop an evaluation system for university structural reforms. Therefore, absolute evaluations of all universities will be conducted, and they will all be given five grades according to the results. The evaluations, using both qualitative and quantitative methods, cover all areas ranging from the overall management and operation to the curriculum, and they consist of common and specialized indicators. Four-year universities and two-year colleges are subject to different sets of evaluation indicators, while national, public and private universities are subject to the same indicators. The measures for structural reform according to the grade are shown in Table 11.

Third, to build legal and institutional foundations for sustainable structural reform, the action plan aims to formulate an enforcement system and relevant laws. The process of realizing an enforcement system includes the establishment of a committee for university structural reforms and the establishment of a non-standing evaluation task force and a university council attended by approximately 400~500 personnel, including incumbent and former professors and industry leaders. Relevant laws mainly concern the legislation of the (provisional) “Act on University Structural Reform and Evaluation,” as a means of implementing structural reforms such as capacity reductions and as a means of developing

TABLE 11—STRUCTURAL REFORM MEASURES: FIVE-LEVEL GRADES

Grade	Structural reform measures
Excellent	• Voluntary capacity reduction, participation in government-funded projects
Good	• Partial capacity reduction, participation in government-funded projects
Average	• Average capacity reduction, participation in government-funded projects
Poor	• A higher-than-average capacity reduction, unqualified for participation in government-funded projects, unqualified for the National Scholarship II, partial restrictions on student loans
Very poor	• A sharp capacity reduction, unqualified for participation in government-funded projects, unqualified for the National Scholarships I and II, full restrictions on student loans, induction of voluntary closure

Note: 1) A university rated “very poor” two times consecutively will be forced to close. 2) National Scholarship I: Differentiated support in connection with income. National Scholarship II: Support in connection with the university’s independent efforts (reducing tuitions, expanding scholarships)

Source: Ministry of Education (January 28th, 2014).

a channel for the voluntary dissolution of private universities according to the results of their evaluations.

To recap, the government’s university restructuring policy intends to implement differentiated reductions of admissions capacities at all universities according to their respective evaluation results. With regard to the goal of strengthening university competitiveness, it would be reasonable to allow universities deemed more efficient to continue to provide educational services while closing those which are deemed inefficient. The government currently pursues policy measures that aim at differentiated reductions in admissions capacities based on the results of university evaluations. It is doubtful, however, that these evaluations can in fact lead to the intended outcome. Regardless of the strictness of the evaluations, it will be challenging to force out a university unless its illegality is clear and certain. The Ministry of Education, not immune from political pressure, is most likely to conclude almost all universities are average in terms of quality. If this is the case, the restructuring policy will mean an average cut in the admissions capacities at all universities, implying that even inefficient institutions will continue to provide educational services. This may be a problem. In other words, any evaluation lacking a market assessment based on students’ choices — assuming all students are provided with accurate information — would only show ‘average in quality.’ This may cause eventual delays in the restructuring process, a possibility that should not be taken lightly.

C. University Reform Experiences of Advanced Economies and Lessons for Korea

The university reform experiences of the US and of European countries have many implications for Korea, which is now under the pressure of restructuring and of realizing higher competitiveness at its universities due to the decline in the school-age population. By the mid-1980s, universities in Europe were managed by academic self-governance and strict government regulations and control efforts; i.e., they were subject to several government regulations. Afterwards, new public management initiatives were introduced with an emphasis on less government

control and more quasi-market elements, based on the expectation that universities with more autonomy over their internal resource allocation and management systems would be more likely to realize management efficiency levels through competition.

Schimank (2007) describes a new type of university governance structure with the following characteristics: high competition, low academic self-governance, high stakeholder guidance, low state regulation levels, and high managerial self-governance.

Meanwhile, Aghion *et al.* (2009) analyzed the impacts of the university governance structure on the research outputs as measured according to the number of patents and the global university research ranking. Their analysis shows a positive correlation between institutional autonomy and competition at public universities in the US and Europe and their research outputs. When given additional financial support, public universities produce more patents in fierce competition with private research universities, which enjoy greater autonomy levels. The quasi-market competition for research funding and for students serves as a foundation for the success of US university departments (Aghion *et al.* 2009).

Schneider and Sadowski (2010) analyzed data pertaining to the employment of doctoral graduates in economics for 2001 and 2002 from 14 universities at Germany and other European countries. According to their analysis, the major characteristics of successful departments are transparency of their academic achievements, no governmental or university regulations, and research funding that is allocated through performance competition. On the other hand, unsuccessful departments are found to lack transparency of their academic achievements, to be under the control of university regulations, and to be given research funding that disregards performance competition.

To summarize, university reforms in advanced economies are moving towards granting more autonomy to universities. This is particularly impressive considering that Germany and many other European countries — where universities were mostly state-run in the past — have made efforts to step away from excessive control (using government support as a means) and to respect the autonomy of universities. Behind these changes is a shift in consciousness: autonomy shall act to encourage inter-university competition and hence have maximum effectiveness. Aghion *et al.* (2009) show that in the US, with several of the world's leading universities, the maximum effectiveness stemming from competition between private universities with greater autonomy is the driving force behind competitiveness by public universities. This offers significant implications to Korean policies regarding universities.

In Korea, due to the area-based regulations, particularly admissions capacity control regulations, universities have provided overall low-quality educational services and have shown weak responsiveness towards social needs; the relevant theoretical assumptions and tests are described in Chapter 4 and 5, respectively. Therefore, the government's planned restructuring policy, with differentiated fiscal support for admissions capacity reductions, could only lead to more inefficiency and even a paradoxical situation of a delay in university restructuring. This policy is, in other words, to impose admissions capacity control on universities in non-capital areas, where admissions capacities have not been regulated thus far,

meaning that the adoption of the policy itself could generate inefficiency.

Universities with low student recruitment rates and hence room for admissions capacity reductions will experience little impact and even be given an incentive to seek fiscal support through a capacity reduction. On the other hand, reducing the admissions capacities at universities with high student recruitment rates would result in decreased opportunities for students. As universities that should be closed come to rely more on fiscal support, the market for university education would experience higher inefficiency at more universities. This is the consequence that the current restructuring policy is most likely to generate. This policy therefore needs to be reconsidered.

The crucial point of a restructuring policy lies in the choice between imposing overall admissions capacity control — as in the current policy — and forcing out those universities ranked at the bottom under a goal of university autonomy over admissions capacity. Simply put, this is a matter of admissions capacity control by the government or by universities themselves. Theoretical and empirical analyses concerning this are described in the following chapter.

IV. Hypotheses and Tests

At present, universities in the capital area are subject to government regulations on their admissions capacities, whereas those in non-capital areas have autonomy in setting their own policies. This chapter discusses the consequences of equilibrium behavior at universities under the current regulations, after which hypotheses that could be tested using data are introduced.

A. Analysis of Equilibrium Behavior According to Admissions Capacity Regulation

For analytic convenience, we assume the followings: 1) there are three universities in a society: A, B and C; 2) each provide educational services, the quality levels of which are identical in the early stage — providing better educational services requires increased effort and costs by each university; 3) there is no information asymmetry between students and universities with regard to the educational service; 4) other physical conditions, such as dormitory and lecture rooms, are all identical; and 5) they are all subject to the same government regulations affecting tuition fees, and they earn nothing other than tuition revenues — meaning that the educational service is a single subject focused on by the universities. This section investigates the equilibrium behaviors of universities under these assumptions when their admissions capacities are controlled and when they are not controlled. Each scenario is again examined by applying the two cases of a sufficient number of students and an insufficient number.

For explanatory convenience, each university has an admissions capacity of 100 students, which here is below the optimal level in terms of the cost structure of the university. The supply of students is assumed to be $300+\Delta$ ($\Delta > 0$), and all three universities provide educational services of the same quality; i.e., which university a student attends is irrelevant (a random choice scenario). In addition, for each

university, there are no incentives to upgrade their educational quality, as there is no way for them to recruit more students and to increase their capacity. This leaves students competing to be included in the total admissions capacity of 300 students.

Under this condition, what would happen to the quality of the educational services provided by these universities? The optimal choice for the universities would be to provide educational services in which there is no discrimination between university graduates and high school graduates, taking into account the time and money invested by each high school graduate in order to complete their university courses, which would be the baseline for comparison in the following discussions in this paper. This level of service with regard to university education is hereinafter referred to as the baseline educational service.

If the supply of students is $300-\Delta$ ($\Delta \in (0,100)$) and if the universities provide the baseline educational service, they would have $100-\Delta/3$ students, as the students' choices are random. Here, if one of them incurs extra costs and provides services of a higher quality, it may be able to fulfill its capacity of 100 students. Therefore, the provision of educational services of the same quality would not yield a state of equilibrium.

Equilibrium would result when A and B meet their capacity by providing educational services of a higher quality. For C, with $100-\Delta$ students, it would occur when they provide the baseline educational service. In this scenario, the quality the educational services offered by A and B is equivalent to the level resulting from the costs paid by A and B pay — which equal precisely the loss in C's revenue resulting from its failure to fill its capacity. Consequently, C's balance of operations is equal to those of A and B, leaving no incentives for C to alter the state of equilibrium. Even if C provides educational services equal to the quality of that by A and B, the number students C could recruit would be $100-\Delta/3$, and C's operating balance would then be lower than that when recruiting $100-\Delta$ when providing the baseline educational service. Moreover, when A and B reduce the quality of their services such that they are no longer above the baseline, this would then provide C an incentive to provide services equal to those offered by A and B. Over concerns about a decrease in their operating balances, A and B would not be induced to alter the equilibrium state. Hence, this is how equilibrium holds.²

This leads to the question of what would happen to student competition under this condition. Because the educational services of A and B are better than that by C, students are going to compete more strongly. Therefore, when the overall student supply is reduced, it remains possible for A and B to meet their student capacities by offering better quality education—a feasible scenario of educational service improvement through competition under student capacity regulations. This, however, applies only when C can afford the loss of operating revenue resulting from the decreased number of registered students. If C cannot handle the loss and is closed, the student supply would eventually be identical to the situation which arises when the student supply exceeds the total capacity. In other words, A and B will be capable of meeting their student capacities only by providing the baseline

²Equilibrium does not hold when two universities provide the baseline educational service. If this scenario is true and hence each university has $100-\Delta/2$ students, a slight upgrade in the educational services would enable the universities to meet their admissions capacities of 100 students, though this is not a state of equilibrium.

educational service, i.e., returning to the starting point with no educational quality improvement in either.

The quality educational services under the student capacity regulation can be summarized as follows. When the student supply exceeds the total capacity, the education quality level would be at the baseline. When the student supply drops below the total capacity, the university may provide better quality education only when there is a university incapable of meeting its capacity. Moreover, upon the closure of this university, the overall quality level would revert to the baseline. Shortly, as long as the capacity regulation is in effect, the baseline educational service remains predominant. Even in the exceptional case of a short supply of students, at which point which some universities may opt to upgrade their education quality, the overall quality would be at the baseline level in the end after the forcing out of the university that fails to meet its capacity.

At this stage, we move on to the case without regulations on student capacity levels. For convenience of the comparison, all three universities are assumed to have an admissions capacity of 100 students at the beginning. The supply of students is set to $300+\Delta$ ($\Delta > 0$). Each university then establishes a student capacity level with which its marginal revenue (the gain in revenue when one additional student is admitted) is equal to the marginal cost (the cost to provide the additional student with the targeted services). The structure of the marginal revenue is identical at all three universities, as assumed above, but that of the marginal cost can vary slightly depending on the level of efficiency in the administrative, governance and incentive structures. Therefore, the different student capacities of the universities are set autonomously.

For convenience of the analysis, A's cost structure is the most efficient, followed by those of B and C. The student capacities which lead to the highest levels of efficiency are 130, 120 and 100. Here, $\Delta > 60$. The capacities vary depending on the efficiency level of the cost structure, and additional revenue is set to be used only for an upgrade in the educational services; educational improvements are the sole target of each university's spending, as each is a non-profit legal person and is not allowed to own operating revenues itself. Therefore, with regard to the quality of educational services, A is first, B second and C third. Here, C's quality of education is higher than the baseline educational service under the capacity regulation. Students at these universities are given more opportunities to enjoy a better education compared to those at universities affected by the capacity control regulation. Furthermore, B and C have an incentive to benchmark A so as to make their cost structure work more efficiently. Therefore A, motivated by competitive catch-up activities by B and C, will have an incentive to be more efficient than the other two.

Meanwhile, when $\Delta < 60$, C, with the lowest education quality and efficiency, will not be able to meet its capacity. Its survival depends on whether or not it can achieve efficiency. This in other words means that more efficient educational services would be available. During this process, it is students that will eventually benefit from the better efficiency and educational quality brought by the autonomous capacity setting. It is this autonomy that provides more students with better quality education, while capacity control efforts provide the baseline

educational service.

B. Hypotheses on the Effects of Regulated Admissions Quotas

Generally, universities encourage enrollments and in order to be selected by prospective students, entering into sharp competition with each other. However, government regulated admissions quotas may change these common practices.

From a purely theoretical perspective, regulated admissions quotas eliminate the pressure of competition among universities to attract more students. This would in turn limit their incentive to offer a higher level of educational services (from the students' perspective when considering the cost of attending university) than the baseline level, as it would not result in increased enrollment. In such a case, the competition between universities would not entail enhancing the level of education to attract more students but based on the standard of the prospective students. As such, the educational performance capabilities of universities would be contingent on the competency level of the enrollees for the respective year.

In contrast, if universities were to have autonomy with regards to their admissions quotas, this would encourage them to become more competitive and to make additional efforts to upgrade their educational services in order to increase their enrollment. This would consequently motivate neighboring universities to boost their own efforts for fear of becoming obsolete. In such a case, universities' educational performance levels would become dependent on the amount of effort made.

Under the premise above, Table 12 shows the trends in educational services and educational performance levels with both regulated admissions quotas and autonomous admissions quotas.

The above discussion of the differing effects of regulated and autonomous admissions quotas can be applied to Korea's case, where universities in metropolitan areas have regulated admissions quotas while those in non-metropolitan areas do not. Generally, Korean students prefer universities in metropolitan areas (which have a location premium). Ergo, the competition to enter metropolitan universities is markedly higher than the competition to enter universities in non-metropolitan areas. Furthermore, the university rankings, based

TABLE 12—EFFECTS OF REGULATED AND AUTONOMOUS ADMISSIONS QUOTAS

	Regulated admissions quota	Autonomous admissions quota
Efforts to improve educational service	Low	High
Educational service	Baseline educational service (A) ³	Higher than (A)
Education performance	Dependent on the competency level of students	Dependent on the university's efforts

Note: The baseline level of educational service refers to the level of university educational service that, after taking into account the time and cost of completing university, nullifies the merit of going on to university from high school.

³Samples from teacher's colleges, the Korea National University of Education, remote colleges, broadcasting universities, technical colleges, cyber universities, and various school and graduate schools amongst others were excluded. Universities that were established solely for the purpose of training religious leaders and to teach the arts and physical education, and are hence not subject to government support, were also excluded.

on entrance exam scores, for the former are also higher. In this respect, universities in metropolitan areas are able to select a higher level of students.

Regulating admissions quotas in metropolitan areas was originally a part of the effort to suppress the excessive population inflow into metropolitan areas. However, despite the increasing population in metropolitan areas, fixed quotas have exacerbated the excessive demand for placement at universities in metropolitan areas and have ramped up the competition for private education (tutoring and supplementary education). At the same time, the excessive demand is weakening the competition between universities.

Based on a theoretical analysis of regulated and autonomous admissions quotas, there is a high probability that the excessive demand resulting from regulated admissions quotas in metropolitan areas is lowering the efforts of these universities to enhance their educational services. Specifically, if universities had to compete with each other to attract more students, this would serve as an incentive for them to enhance the quality of the education they offer. In turn, these efforts would have an impact on their educational performance capabilities.

As such, the following theoretical hypotheses can be established pertaining to the behavior of universities with regard to educational input and performance in both metropolitan and non-metropolitan areas. Of course, this assumes that the universities in metropolitan areas have a location premium.

Hypothesis 1: [Efforts to improve educational services] Compared to universities in metropolitan areas which have a location premium and for which excessive demand exists due to the regulation on admissions quotas, universities in non-metropolitan areas, which have to compete in order to attract more students, would be more committed to enhancing their educational services.

Hypothesis 2: [Education performance] Universities in non-metropolitan areas would have higher levels of educational performance compared to the quality of their enrollees. Additionally, their educational performance levels would be affected by input variables that reflect their efforts to improve their educational services. However, universities in metropolitan areas, which have less of an incentive, would show lower educational performance levels compared to the standard of their enrollees, and their educational performance levels would depend on input variables that are relevant to the efforts made.

Although it would be difficult to examine the validity of the above hypotheses closely, this paper will attempt to find circumstantial evidence through a series of analyses that are based on variables for which data were available.

First, the educational performance levels and the graduate employment rates are measured. Although the quality of employment cannot be reflected, with government focusing on the graduate employment rate in university evaluations and

in funding decisions, it is a vital performance indicator. There are many input factors that affect education performance. However, the main factors can be broadly divided into two categories, i.e., preliminary input factors such as the quality of enrollees, and process input factors which are related to the quality of the universities' educational services.

For the preliminary input factor, this paper uses enrollees' CSAT results, and for the process input factor, the percentage of courses taught by full-time faculty was used as the key variable along with the educational environment, i.e., the number of full-time faculty members per student, the amount of government funding per student, and the amount of university investment per student, as the control variable.

C. Hypotheses Tests

The subjects for the empirical analysis presented in this paper are limited to private four-year universities that are eligible for government funding. Data on the variables necessary for the analysis were extracted from the government's Higher Education in Korea report (<http://www.academyinfo.go.kr>).⁴ A total of 391 observations of 132 universities from 2011 to 2013 were used.

The most appropriate criterion for educational performance is the disparity between students' competence levels at the points of enrollment and graduation. Variables that reflect this may vary, but this paper uses the graduate employment rate⁵ as the dependent variable. The employment rate denotes the market's evaluation of the graduates' abilities, and when entrance scores, which show students' competence levels at enrollment, are considered here, educational performance can be confirmed.

For the explanatory variables, the percentage of courses taught by full-time faculty and the number of full-faculty members per student, government funding, and grant transfer amounts from industry-academic cooperation departments were used.⁶ Entrance scores have the largest impact on the graduate employment rate

⁴Given that the analysis data in this study are based on three-year panel data (2011-2013), a fixed-effect model may be most suitable. However, there are limitations when applying this model, as the variables used cannot change radically over the short term; hence, a pooled ordinary least-square model was used.

⁵The employment rate (as of 2012) = {(those with workplace-based health insurance + graduates employed on campus + overseas employment + employed persons in farming businesses)/employable persons} X 100. The employed (as of 2012) include those with workplace-based health insurance, graduates employed on campus, overseas employment and persons employed in farming businesses. Graduates employed on campus (as of 2012) refer to those with workplace-based health insurance, as of the date of the survey, who signed a contract which is longer than one year with a university foundation or relevant institution (industry-education foundation, university or enterprise) and are paid more than the minimum wage; the salary of a person employed at the per-hour minimum wage of 4,580 won (as of 2012) is 957,220 won. Overseas employment refers to those who work for more than 15 hours per week and maintain an employment contract which is longer than 91 days. Persons employed in farming businesses refer to those without workplace-based health insurance working in farming businesses as of the date of the survey. Employable persons (according to the 2012 guideline): Graduates - (those who are advancing into higher education, undertaking their mandatory military service, those unable to work, the officially excluded and foreign students). Persons who are unable to work refer to those who are inmates, dead, those who have immigrated overseas and patients hospitalized for more than six months. Persons who are deemed officially excluded refer to those who are medical aid recipients, graduates with a degree from religious leader training courses, female military officers attending a training course before being officially commissioned and persons eligible for education courses provided by professional education institutes for aviation workers.

⁶There are diverse ways to enhance educational performance. Examples include adjusting the percentage of

and as such are the most suitable variable; however, due to difficulties in obtaining data, placement scores from private university entrance exam organizations were used (CSAT score percentile: CSAT score out of 400 points (sum of points for the four sections) converted into a percentile). Also, variables that reflect whether the respective universities were established after the implementation of the normative system for university establishment (implemented in 1997: policy to ensure that universities can be established when the requirements are met)⁷ and the admissions quotas were added as control variables. Finally, in order to control the disparity in the employment possibilities of different majors, this paper used the percentage of students majoring in humanities and social sciences as well as arts and physical education.

1. Percentage of Courses Taught by Full-time Faculty

Under the assumption that the percentage of classes taught by full-time faculty correlates to a university's efforts to enhance their educational service, this paper deduces (as shown in Hypothesis 1) that universities in non-metropolitan areas have a higher percentage of courses taught by full-time faculty than those in metropolitan areas. In order to confirm this, Table 13 uses the combined data pertaining to the observed values from universities in metropolitan and non-metropolitan areas to verify the differences in the percentages of courses taught by full-time members of the faculty.

Even if the average CSAT score for each university was controlled to take into account the discrepancy in the average competency level of students at metropolitan and non-metropolitan universities (a comparison between universities with similar scores), it was again revealed that the percentage of courses taught by full-time faculty members at non-metropolitan universities was higher than that at metropolitan universities by nearly 11%.

As shown by the coefficients of the interaction terms in Table 15, the percentage of courses taught by full-time faculty members was not influenced by the enrollees' entrance scores. This implies that non-metropolitan universities are more committed to enhancing their educational services than those in metropolitan areas regardless of the competency level of the students. Meanwhile, although full-time faculty members conduct research in addition to teaching, the percentage of courses taught by full-time faculty cannot be used to measure their levels of

courses taught by full-time faculty, increasing the number of full-time faculty workers, and making efforts to secure government funding and/or efforts to promote industry-education cooperation. Which ones are used depend on the marginal costs. Specifically, government funding will depend on official measures, and industry-education cooperation and university enterprises entail considerable costs. In particular, increasing full-time faculty from the universities' perspective will be a considerable burden in both the short and long term. As such, the easiest method for universities is to adjust the percentage of courses taught by full-time faculty.

⁷Before the adoption of the normative system, the necessary procedures to obtain permission to establish a university were highly complicated and difficult to complete. The system simplified the process, allowing universities to be established if the requirements are met. The government sought a change in Korea's higher education policy paradigm in 1995, often called the May 31 Education Reform, and its core policy was the creation of a normative system. Now that the system has become fully initiated, Korea's higher education system has become corpulent, according to certain critics.

TABLE 13—DIFFERENCE IN THE PERCENTAGE OF COURSES TAUGHT BY FULL-TIME FACULTY

Variable	Total
Average CSAT score (A) (0 ~ 400)	-0.003 (0.011)
Non-metropolitan university (B)	10.843*** (3.769)
(A) * (B) Interaction	-0.022 (0.016)
Year dummy and relevant variables controlled	○
Constant	75.299*** (5.517)
Obs.	384
Adjusted coefficient of determination	0.2968

Note: Figures in () are standard errors * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Relevant control variables include whether the university was established after the adoption of the normative system, the log value of the admissions quota, and the proportion of humanities and social sciences and arts and physical education majors.

Source: Reproduction of data provided by Higher Education in Korea (<http://www.academyinfo.go.kr>).

research accomplishment.⁸ However, even when these differences are considered, the results show that the greater level of commitment by universities in non-metropolitan areas to increase the percentage of courses taught by full-time faculty remains unchanged.

2. Graduate Employment Rate

Location premiums enable universities in metropolitan areas to attract more competent students. In turn, the students' high competence levels serve to increase the respective universities' educational performance levels (graduate employment rates). Under the assumption that the efforts by universities in all areas are at the same level, the graduate employment rates of metropolitan universities should be higher or at least similar to those of non-metropolitan universities. However, this paper reveals that the graduate employment rates of metropolitan universities are on average 56.2%, 3.1%p lower than that of non-metropolitan universities (59.3%), indicating that the former has inefficiencies which hinder their efforts to enhance their educational performance and make improvements.

Furthermore, despite the reservation wage, i.e., the subjective minimum wage level that determines employment, being higher on average for students from metropolitan universities, the number of instances of delayed employment is also higher. Accordingly, the graduate employment rates of metropolitan universities

⁸From a quantitative perspective, there are no statistical differences in the number research papers per full-time faculty member published in research journals listed in the NRFK. However, with regard to internationally published papers or SCI papers per faculty member, there is a difference of 0.1 between metropolitan (0.2) and non-metropolitan (0.1) universities, meaning that for every two papers published by ten faculty members of metropolitan universities, one will be published by a researcher at a non-metropolitan university.

may be lower in the short term. It should be noted, that the quality of employment was not reflected. Ergo, the analysis of the graduate employment rate should be supplemented with an analysis using variables that reflect the quality of employment, e.g., the average wage and/or the numbers of permanent positions. However, as the relevant data was unavailable, this research is left for the future.

The following section will analyze the different effects of input factors on the graduate employment rate. The focus will be placed on comparing the relative effects by the preliminary input factors (enrollee scores) and the process input factors (efforts to improve educational service) on educational performance (employment). Even under the assumption that there is a systematic difference in the quality of lectures and entrance scores, as the analysis in this paper divides metropolitan and non-metropolitan universities and examines the factors influencing the graduate employment rate in each league, it represents an opportunity to investigate the differences between the behaviors of universities based on whether they have regulated admissions quotas or not.

Table 14 shows that the educational performance (graduate employment rate) of metropolitan universities is contingent on individual students' competence levels and not on the efforts of the respective universities. A rise of 100 points in the average CSAT score accounts for a 2.2~5%p increase in the graduate employment rate, but the percentage of courses taught by a full-time faculty member is found to have contributed little to the employment rate.

TABLE 14—ANALYSIS OF FACTORS THAT
INFLUENCE METROPOLITAN UNIVERSITIES' GRADUATE EMPLOYMENT RATES

Variable	(1)	(2)	(3)	(4)
Percentage of courses taught by full-time faculty (%)	-0.051 (0.054)	-0.049 (0.054)	-0.036 (0.056)	-0.054 (0.054)
Average CSAT score (0 ~ 400)	0.050*** (0.010)	0.048*** (0.011)	0.044*** (0.012)	0.022* (0.013)
Log value of the admissions capacity	-4.719*** (0.968)	-4.567*** (1.042)	-4.632*** (1.046)	-4.141*** (1.002)
University established after the adoption of the normative system	2.335 (1.980)	2.036 (2.121)	2.279 (2.141)	1.720 (2.042)
Proportion of humanities & social sciences and arts & physical education majors	-0.187*** (0.035)	-0.184*** (0.036)	-0.169*** (0.040)	-0.172*** (0.038)
Number of full-time faculty per student		4.921 (12.280)	2.451 (12.615)	1.828 (12.001)
Log value for the amount of government funding per student			0.350 (0.403)	0.260 (0.384)
Log value for per-student grants transferred from industry-academic cooperation departments and school-based enterprises				0.008*** (0.002)
Year dummy controlled	○	○	○	○
Constant value	89.486*** (7.848)	88.368*** (8.351)	86.551*** (8.615)	89.438*** (8.227)
Obs.	155	155	155	155
Adjusted coefficient of determination	0.3331	0.3293	0.3281	0.3920

Note: Figures in () are standard errors * p < 0.1; ** p < 0.05; *** p < 0.01.

Source: Reproduction of data provided by Higher Education in Korea (<http://www.academyinfo.go.kr>).

The above findings prove that universities in metropolitan areas have little incentive to improve their educational services. Indeed, the reason behind the insignificant contribution of the percentage of courses taught by full-time faculty to the improvement of educational performance may be that there is an ample supply of competent part-time lecturers in the region whose quality levels are similar to those of full-time lecturers. However, even if the quality of part-time lecturers is superior, the bond that full-time faculty members have with the students and their education must be taken into account. Furthermore, as expected, Table 14 confirms that graduate employment rates decrease with an increase in the number of enrollments and students majoring in the humanities and social sciences, and arts and physical education majors.⁹ The same phenomenon can be seen in Table 4 for universities in non-metropolitan areas.

Table 15 shows for universities in non-metropolitan areas, educational performance (the graduate employment rate) is contingent on their efforts and not on the competence level of the students. Moreover, although CSAT scores are unrelated to the graduate employment rate, a 10%p rise in the percentage of courses taught by full-time faculty is equivalent to a 1.07~1.19%p increase in the graduate employment rate. This also implies that unlike metropolitan universities, there is a wide quality gap between part-time lecturers and full-time faculty at non-metropolitan universities. Nevertheless, the results are still significant because increasing the percentage of courses taught by full-time faculty members is a major part of universities' efforts to enhance the quality of their education. What is confirmed here is that the educational performance levels of non-metropolitan universities that do not have a location premium and that have regulated admissions quotas can be changed through the efforts of the respective universities. Furthermore, contrary to general beliefs, the graduate employment rates of non-metropolitan universities established after the adoption of the normative system are higher than those of universities established before this system.¹⁰

As shown above, despite metropolitan universities having higher quality students, the graduate employment rates are lower. Furthermore, the graduate employment rates of metropolitan universities are determined by preliminary input factors such as the students' entrance scores, while those of non-metropolitan universities are affected by process input factors such as the efforts made to improve educational services. However, due to the limited amount of available data, it would be an exaggeration to claim that the efforts made by universities in metropolitan areas to enhance their educational performance levels are weak purely based on the results of this analysis.

Nonetheless, based on the theoretical argument that excessive demand reduces the incentive for universities that have regulated admissions quotas to improve the quality of their educational services, this paper has deduced implications

⁹If investments do not correlate with the increase in students, this could negatively impact students' educational performance levels and may lead to difficulties in the management of students, lectures and employment and start-ups. As such, small universities are preferable to large universities with regard to student and degree management, which is the basis for the argument that even with autonomy, admissions quotas cannot be limitless.

¹⁰Because the lecturers at universities that were established after the adoption of university establishment regulations are younger, fixed costs such as wages are low. Therefore, such universities are able to invest to enhance their educational performance.

TABLE 15—ANALYSIS OF FACTORS THAT
INFLUENCE NON-METROPOLITAN UNIVERSITIES' GRADUATE EMPLOYMENT RATES

Variable	(1)	(2)	(3)	(4)
Percentage of courses taught by full-time faculty (%)	0.107** (0.048)	0.115** (0.049)	0.118** (0.049)	0.119** (0.049)
Average CSAT score expressed as a percentile of the respective university (0 ~ 400)	-0.011 (0.009)	-0.009 (0.009)	-0.012 (0.010)	-0.013 (0.010)
Log value of the admissions quota	-1.176** (0.511)	-1.292** (0.535)	-1.323** (0.536)	-1.333** (0.540)
Universities established after the adoption of the normative system	3.515*** (1.264)	3.532*** (1.266)	3.619*** (1.269)	3.624*** (1.272)
Proportion of humanities & social sciences and arts & physical education majors	-0.234*** (0.028)	-0.238*** (0.029)	-0.232*** (0.030)	-0.232*** (0.030)
Number of full-time faculty per student		-10.622 (14.503)	-11.287 (14.517)	-11.327 (14.552)
Log value for the amount of government funding per student			0.335 (0.332)	0.330 (0.333)
Log value for per-student grant amounts transferred from industry-education foundations and school-based enterprises				0.001 (0.006)
Year dummy controlled	○	○	○	○
Constant	74.679*** (6.222)	75.415*** (6.309)	73.715*** (6.530)	73.843*** (6.583)
Obs.	222	222	222	222
Adjusted coefficient of determination	0.4248	0.4236	0.4236	0.4210

Note: Figures in () are standard errors * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Source: Reproduction of data provided by Higher Education in Korea (<http://www.academyinfo.go.kr>).

regarding the behavior of universities in metropolitan areas. Specifically, although the regulated admissions quota was implemented to alleviate the excessive concentration of admissions in metropolitan areas, the current structure (quotas can be filled without effort and the number of enrollments cannot be increased even with more effort) will fail to encourage universities to boost efforts to strengthen their educational performance levels.

V. Conclusion and Policy Recommendations

In order to enhance the competitiveness and educational performance capabilities of higher education overall in Korea, universities must be given autonomy and an incentive system must be established to generate competition so as to provide better quality education. In particular, to achieve this based on the pursuit of 'consumer-oriented' education and university restructuring through 'voting with one's feet', universities must be selected by more prospective students through the improvement of the educational services offered by them. However, under the current policies, which strictly control the admissions quotas of metropolitan universities, excessive demand will continue, with the result being weakened incentives to enhance the quality of educational services.

From this perspective, it is at least theoretically valid to provide universities with autonomy over their admissions quotas rather than controlling them with government policies. Moreover, although the original aim of regulated admissions quotas was to control the overflow in metropolitan universities, the question of how long a policy that serves to overheat the competition for private education while weakening the competition between universities to improve educational services can continue needs to be addressed.

The government's current university restructuring policies include ranking universities based on evaluation indices and adjusting or maintaining admissions quotas accordingly. Additionally, government funding is increased based on universities' voluntary efforts to reduce their quotas. However, despite the fact that the aim of providing the incentives is to correlate the provision of higher education with the declining student population, these policies can introduce the following problems.

Korean private universities are highly dependent on tuition-based revenue because, as private universities in metropolitan areas with regulated admissions quotas as well as regulated tuition, they have little financial leeway. On the other hand, universities that are in less demand and are able to reduce their admissions quotas remain unaffected by the reductions or by revenue from funding provided by the government to meet the reduced quota. However, this situation results in the failure to weed out uncompetitive universities (based on weak demand). The effect of quota reductions on universities in high demand can take two forms, both of which also result in inefficiency. First, the reductions serve to reduce the opportunities for students to enroll in universities of their choice. Secondly, the reduction in admissions will deteriorate the universities' finances, which will in turn cut education investments and eventually diminish the quality of education.

The most appropriate method to restructure universities is one that is founded on the market function, which is centered on consumer choice. However, considering the constraints of the location premiums of metropolitan areas, this will be an impossible feat. In this respect, rather than focusing on the quality of educational services, a level playing ground which minimizes the rent of the location premium should be established.

An example of this would be to maintain or reduce the current level of the total admissions quota for metropolitan areas or to consider giving those universities autonomy to decide on their level within the total admissions quota. More pointedly, universities would be allowed to compete with other universities in their respective regions. There will be little opposition from universities in non-metropolitan areas, as this does not entail any significant changes. As such, the political implications will be minimal. Of course, in this case there would be the burden of regularly adjusting the admissions quotas of metropolitan universities to maintain fairness to those in non-metropolitan areas.

Additionally, there are numerous other measures, including integrating and fostering non-metropolitan universities or relocating metropolitan universities to non-metropolitan areas. In any case, a societal consensus must be reached. Whichever measure is selected, consideration must be given to whether the measures revitalize competition to enhance the quality of educational services at universities. Furthermore, prospective students must be allowed to make their own

choices based on detailed and transparent information about the universities' educational environments and performance levels, and universities which are not competitive must be weeded out.

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