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**Research Report**

## Ways to Improve Government Subsidy Policies for Higher Educational Institutions to Enhance the Employment Rate of Their Graduates

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## KDI FOCUS

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## Ways to Improve Government Subsidy Policies for Higher Educational Institutions to Enhance the Employment Rate of Their Graduates

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**"As high rates of youth unemployment have been a prominent social issue, the government should seek to alter fiscal subsidy policies for higher educational institutions in such a way that increases the employment prospects of university graduates, and should also place a greater focus on performance indicators, which affect the employment rates, such as the level of scholarship benefits, the student-faculty ratio, and education spending per student."**

### I. Unemployment Crisis among University Graduates and the Necessity of Government Subsidies

The job crisis for Korean university graduates continues to worsen with each passing year. According to the Information Service of Higher Education in Korea, the employment rate for four-year university graduates stood at 54 percent in 2014, continuing a years-long downward trend.<sup>1)</sup> Growing unemployment among university graduates is partly attributable to labor market

\* This is the translated version of KDI FOCUS released on February 2, 2015.

\* This study refers to Kye Woo Lee and Miyeon Chung (2015), *Enhancing the Link between Higher Education and Employment*, pp.19–27, International Journal of Educational Development Issue No. 40.

1) Information Service of Higher Education in Korea (Alrimi Database) at [academyinfo.go.kr](http://academyinfo.go.kr) as of December 15, 2014.

conditions such as lackluster demand for new employees after the global economic slowdown that started in 2008, as well as institutional obstacles to labor flexibility. In addition, changes in the country's economic structure and technological development have driven the economy away from brick-and-mortar industries, changed the nature of jobs, and reduced the number of positions available, aggravating youth unemployment problems.

**On top of socioeconomic factors, structural problems inherent to the higher education system also contribute to high youth unemployment rates.**

The labor supply side, meanwhile, faces a sharp increase in university graduates alongside a shortage in highly skilled workers, while job seekers voluntarily stay unemployed in pursuit of “decent jobs” (that is, jobs offering stability and a decent income), contributing to a decline in the employment rate. On top of the aforementioned socioeconomic factors, structural problems inherent to the higher education system can also be said to contribute to high youth unemployment.

**The deregulation of university establishment led to a spike in the number of higher education institutions, contributing to the ‘dumbing-down’ of higher education.**

When considering the challenges university graduates face in the job market, one can't help but consider the implications of past initiatives to expand the country's supply of universities. [Figure 1] shows that the number of tertiary education institutions surged in the wake of policy designed to encourage the availability of higher education since the introduction of the high school equalization policy in 1974. In particular, the number of universities surged in the mid-1990s due to the deregulation of university establishment, and the university enrollment rate jumped from 27 percent in the 1970s to more than 80 percent in the 2000s. In particular, the overall quality of higher education declined after a sharp increase in poorly financed bottom-tier universities. This has subsequently resulted in structural problems, which make it difficult to provide highly skilled labor in response to fast-changing market demand. As a consequence, businesses struggle with a talent shortage and invest significant resources into training new employees, while new graduates continue to enter the market.

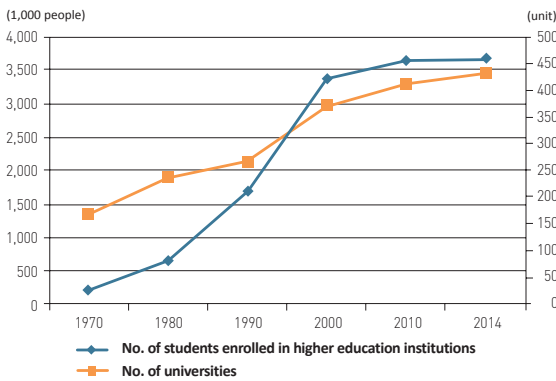
As the Korean economy continues to evolve, the environment surrounding universities also changes. With the arrival of the knowledge-based society, the quality of human resources is decisive to national competitiveness. Universities can no longer serve as ivory towers but should instead place a greater amount of focus on practical, realistic, and function-oriented education. If universities fail to serve practical and functional roles, higher education may not be entrusted to universities, making government intervention inevitable.

**Government subsidy for higher education has increased every year, which calls for an efficiency-driven approach.**

Higher education funding plays a key role in fulfilling the objective of university education—that is, connecting graduates with decent jobs in the job market. According to an OECD report published in 2014, Korea has the highest percentage of the relevant age group enrolled in tertiary education institutions compared to other OECD member countries, and a significantly higher ratio of private-to-public funding of higher education.<sup>2)</sup> As the government's policy to expand universities resulted in a higher number of institutions, it is essential that the government extend financial support for the improvement of academic quality. In this regard, the Korean government has increased its fiscal spending on higher education since 2010, which amounted to KRW 10

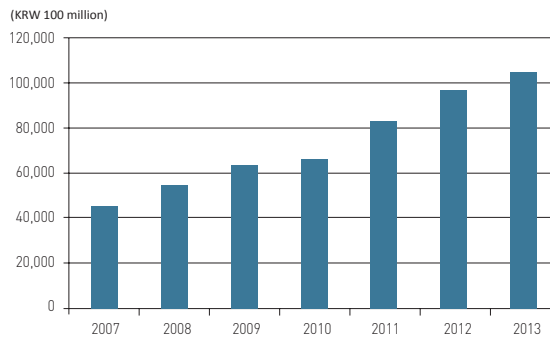
2) OECD (2014), *Education at a Glance*, p.236, Chart B3.1.

[Figure 1] Changes in the Number of Universities and University Students



Source: KEDI's Education Statistics Service (kess.kedi.re.kr) as of December 16, 2014.

[Figure 2] Government Subsidies for Higher Education over the Past Seven Years



Source: KEDI Higher Education Financial Support Information System (hiedusupport.kedi.re.kr).

trillion in 2013 (see Figure 2).<sup>3)</sup>

Verifying policy effects is a precondition to justifying an increase in public funding of higher education. The education system is traditionally thought to require long-term planning that looks a century ahead. As such, it was taboo for past administrations to assess education from an economic perspective, and thus there have been few efforts to evaluate educational performance. A cultural shift, however, has made it more acceptable to prioritize economic efficiency in the state-funded education system, making it increasingly important that education generate economic values and achieve maximum output with limited resources.

In light of these observations, this study focuses on unemployment, one of the country's most pressing social issues, and devises policy plans to increase the employment rate through fiscal assistance programs, carried out in order to ensure that government financial support for higher education can generate greater policy effects.

## II . Government Subsidy for Higher Education: Current Status and Issues

The government has executed a variety of policies in preparation for a sharp contraction in school-age population over the next decade, as well as to enhance the quality and competitiveness of higher education. Against this backdrop, the government announced the university restructuring plan in January 2014 as part of its efforts to improve the quality of higher education and weed out poorly performing universities. In addition, the government has implemented projects such as University for Creative Korea (CK) and Leaders in Industry-College Cooperation (LINC). The Park Geun-hye administration continues to provide a number of

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3) KEDI's Higher Education Subsidy Information DB (hiedusupport.kedi.re.kr) as of December 15, 2014.

&lt;Table 1&gt; Key Government-financed Projects for Higher Education

Project	Purpose	Period	Budget (KRW billion)	Participants
University for Creative Korea (CK)	To enhance competitiveness of universities outside the Greater Seoul Area	2009–	257.7	Universities outside the Greater Seoul Area
Advanced College of Education (ACE)	To foster leading universities in education	2010–	57.3	Education-oriented universities
Brain Korea 21 (BK21)	To enhance research capacity	2013–	297.3	Research-oriented universities
Leaders in Industry-College Cooperation (LINC)	To foster leading universities in industry-academy cooperation	2012–	238.8	Universities focused on industry-academy cooperation

Sources: Yeong In Suh et al. (2014).

&lt;Table 2&gt; Changes in Indicators for PEUEC (Project Enhancing Universities' Educational Competency)

(Unit: %)

Year	Performance indicator			Environmental indicator						
	Employment Rate	Student Enrollment Ratio	Internationalization Index	Full-time Faculty Ratio	Management of Curriculum and Academic Affairs	Educational Spending per Student	Scholarship Benefits as Percentage of Individual Educational Spending	Level of Tuition Hike (Tuition Burden Index)	Investment in Student Education	College Admission Screening
2008	25	25		10		20	20			
2009	25	25	5	10		15	20			
2010	25	20	5	10	5	15	15	5		
2011	20	20	5	10	10	10	10	10		5
2012	20	20		10	20		10	10	10	
2013	15	17.5		12.5	22.5		10	12.5	10	

Note: Reconstructed based on private universities.

Source: Press releases issued by the Ministry of Education from 2008 to 2013.

The government has established a series of indicators related to university education and has provided financial support based on a predetermined formula using these indicators. As such, the objective of government financial support is to improve the quality of higher education by seeking improvement among selected education indicators.

different types of support to universities, including the implementation of the “half-price tuition” policy, which contributes to increasing the level of scholarship benefits.

At present, the government is extending financial support to higher education institutions primarily through fiscal assistance program, which select beneficiaries based on a formula using a set of higher educational indicators. Government-financed university projects are implemented with a view to achieving better educational quality by improving the institutions’ performance judged by the selected educational indicators. As such, universities are motivated to manage their educational rees in accordance with such indicators, and in fact many universities are working hard to achieve performance targets of these indicators. <Table 1> is an overview of major government-financed projects.<sup>4)</sup>

Though fiscal subsidy programs have been implemented for a considerable period, many of

4) Yeong In Suh, et al. (2014), *Study on the Improvement of Evaluation Criteria of Government-Financed Higher Education Project*, KEDI Research Report.

the problems they are intended to resolve remain unaddressed. One cause of such phenomenon is that the evaluation formulas have a tendency to arbitrarily select evaluation indicators without conducting any empirical analysis of whether these indicators are known to make a substantial contribution to improving the quality of education. In addition, evaluation indicators are typically weighted without objective analysis. <Table 2> shows the performance evaluation indicators of the Program for Enhancing Universities' Educational Competency (PEUEC).<sup>5)</sup> With the exception of the employment rate, the adopted education output indicators are all input indicators, which are hardly associated with outcome of educational programs, and many of these educational input indicators lack any support from empirical effectiveness analyses. In addition, these indicators are arbitrarily and inconsistently weighted throughout years. The selection of education indicators and their weights is not based on objective rationale or empirical effectiveness analyses, which undermines credibility of evaluation and fails to ensure the effectiveness of financial support projects.

As might be assumed, government-financed projects can have different immediate goals as can be seen in <Table 1>. The ultimate objective of government-financed projects such as ACE or LINC, however, is the improvement of educational quality, with the employment rate remaining the best educational quality indicator in this regard. As a result, without a consideration for the employment rate, the use of education input indicators can neither achieve a more optimal employment rate nor sustain the implementation of the immediate project goals.

Theoretically, to effectively implement government-financed higher education projects, it is imperative to clearly define the ultimate objectives of such initiatives and use empirical analysis to identify which factors under control by higher educational institutions contribute to the success of these objectives. In addition, it is most efficient to allocate government's subsidy resources among universities according to their contribution to achieving the ultimate objectives. As such, this study examines whether the implementation of fiscal assistance programs complied with these theoretical principles and proposes policy directions for improvement.

### III . Results of Analysis of University Education Variables Affecting the Employment Rate

Though there are numerous education output indicators that are designed to help evaluate the quality of education, the most realistic indicator in the Korean education environment is employment rate. While some researchers and university educators may not agree on the use of the employment rate as an output of education, there is evidence to suggest that the employment rate of university's graduates may be representative of its educational quality and

The selection of education indicators and their corresponding weighting is a process that lacks objective and empirical effectiveness analysis, and the weights are inconsistent over time, a challenge to the effectiveness of fiscal subsidy programs.

To effectively implement government-financed university projects, it is imperative to clearly define the ultimate objectives of such projects and empirically identify factors contributing to the achievement of these objectives. In addition, it is most efficient to differentiate the allocation of financial resources among universities according to their contribution to achieving the ultimate objectives.

5) Min Sik Hong (2012), *Directions for Improvement of Evaluation Indicators for Higher Education Evaluation: with Emphasis on the PEUEC*, Higher Education 175: pp 68–75.

functional role. This relationship strongly promotes the notion that the graduate employment rate should be a chief consideration when universities are screened for government-financed projects and subsidies. In addition, given that a high unemployment rate among university graduates has emerged as a significant socioeconomic challenge, employment is undeniably a key output of education. Put simply, high-quality university education should lead to an increase in the employment rate. It is also virtually impossible to provide quality education, which fails to increase the employment rate, as it is highly probable that demand for such education will eventually decline. In addition, given that education-oriented universities outnumber research-oriented universities, it is reasonable to consider the employment rate among university graduates as a key education output.

**This study defines the employment rate as an output of education and identifies input variables of university education, which affect the employment rate, in order to empirically analyze and review the extent to which such variables affect the improvement of employment rate.**

**Educational spending per student, student-faculty ratio, the proportion of scholarship benefits are three factors that have statistically significant impact on employment rate.**

Among the concepts this study outlines is that of the employment rate, which can be defined as an output of education, and that of the input variables of university education, which affect the employment rate in order to empirically analyze and review the extent to which such variables affect the improvement of employment rate. Education input variables used for this analysis have been selected from quantitative indicators used in various government-financed projects. After controlling for the location (Greater Seoul Area and other regions) and type (public or private) of universities, whose impact on the employment rates has been established by earlier research, this study analyzed data disclosed during 2010 and 2011 at the Information Service of Higher Education operated by the Korean Council for University Education (KCUE).<sup>6)</sup> The regression analysis showed that three educational indicators have statistically significant impact on the employment rate.<sup>7)</sup>

The first indicator is the educational spending per student, which measures the level of investments, made by universities and is calculated by dividing the total educational spending with the number of students. The analysis demonstrated a positive correlation between the per-student educational spending and the employment rate. Additional analysis was conducted to gauge the pace at which the employment rate increases in accordance with per-student spending increases. The employment rate growth did not remain constant but accelerated in line with an increase in the per-student spending, showing a concave function.

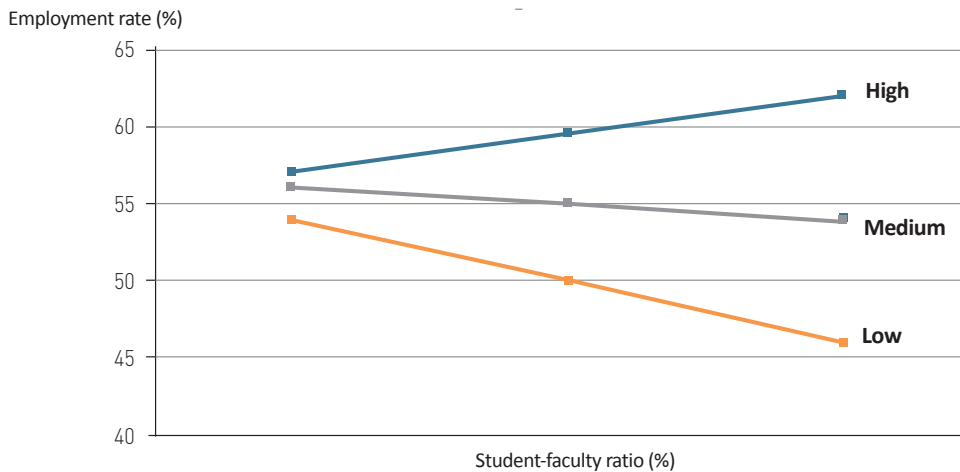
The second indicator is the student-faculty ratio, a key measure of academic quality. The analysis suggested that a lower student-faculty ratio is generally associated with higher academic quality, while an increase in the ratio was seen to negatively impact employment rate growth. As in the case with the per-student spending, the researchers conducted an additional analysis of the pace of the employment rate growth, which demonstrated that an increase in the student-faculty ratio leads to a sharp decrease in the employment rate.

6) Information Service of Higher Education in Korea (Alrimi Database) at [academyinfo.go.kr](http://academyinfo.go.kr) as of December 15, 2014. This study could not use employment rates by university department, but it is desirable for future studies to use employment rates by university department. For this purpose, it is necessary for Alrimi Database to collect and disclose education input indicators comparable to this.

7) Kye Woo Lee and Miyeon Chung (2015), *Enhancing the Link between Higher Education and Employment*, pp.19–27, International Journal of Educational Development Issue 40.



[Figure 3] Interaction Effects between Per-student Spending and the Student-faculty Ratio



Sources: Lee and Chung (2015).

The third indicator is the scholarship benefits as a percentage of total financial obligations of students such as tuition and fees. According to the analysis, an increase in the scholarship benefit ratio has a positive effect on the employment rate growth. The quality of education is assumed to increase in line with the availability of scholarship benefits, as financial subsidy allows students to have more stable access to education, and a high proportion of scholarship benefits can attract highly qualified students.

Finally, contrary to the expectations of the research team, the ratio of students to industry professional faculty members did not have a statistically significant impact on the employment rate. The absence of correlation suggests that the current industrial-academic cooperation system is not effective in improving the employment rate.

A closer look into the per-student spending shows that the per-student spending indicator comprises expenditures on human and material resources. As such, the per-student spending indicator can affect the student-faculty ratio. Accordingly, the study conducted an analysis of an interaction effect between the per-student spending and the student-faculty ratio and confirmed the existence of interaction effects. Interaction effects vary by the level of per-student spending.

According to the analysis, when an annual per-student spending stands at a relatively high level of KRW 12.8 million or higher, the employment rate continues to rise despite an increase in the student-faculty ratio. In contrast, when annual per-student spending stands at a relatively low level of KRW 5.5 million or lower, the employment rate continues to decline in accordance with an increase in the student-faculty ratio.

The analysis demonstrates that high per-student spending can offset the negative effect of an increase in the student-faculty ratio and low per-student spending cannot. It suggests that universities with a relatively high amount of per-student spending opted to invest more on employing highly-qualified teaching staff, offering a higher level of remuneration for teaching

The analysis of an interaction effect between the per-student spending and the student-faculty ratio indicators confirmed the existence of interaction effects. When the per-student spending is above a certain level, the employment rate increases regardless of any increase in the student-faculty ratio.



staff, and purchasing better educational facilities and equipment, rather than increasing the number of academic staff.

On the other hand, in the case of universities with relatively low per-student spending, the negative effect of a high student-faculty ratio on the employment rate could not be offset due to lackluster investments in recruiting highly-qualified teaching staff, educational facilities and equipment and a low level of remuneration for teaching staff. Given such interaction effects, per-student spending is the education input variable with the most significant impact on the employment rate.

#### IV . Policy Suggestions

Although university education is not as valuable an asset as it had been in the past, a significant number of Koreans still pursue higher education and risk unemployment after graduation. In short, university students are facing the dual threat of a tuition burden on top of lower job prospects. This issue has emerged as a widespread social problem, which is beyond the scope of individual efforts. Recognizing the gravity of the challenge, the government has made various policy efforts to address the situation from both demand and supply sides. For example, lawmakers have sought to increase flexibility on the labor market and at the same time to increase financial support for universities under the banner of “half-price college tuition” to ensure that the tuition burden can decrease, and students can concentrate more on their studies. However, given that education accounts for a significant share of government fiscal spending, it is unarguably necessary that policymakers be effective in their execution of public spending on education. In addition, the public spending on education should be executed in a way that increases the employment rate among university graduates. This study limits its focus to the supply side of the labor market and makes the following policy suggestions to ensure that government-financed projects, a key policy initiative to improve academic quality, will increase the employment rate among university graduates.

Based on the results of the study, it is recommended that the government use those education indicators, which are found effective in increasing the employment rate, to evaluate university performance and determine the level of financial support to be provided to such institutions. Moreover, the provision of financial support for each institution should ideally be based mainly on indicators that have an empirically proven impact on the employment rate, and be made in such a way that promotes each institution’s performance judged by those indicators. In light of this conclusion, the researchers argue that government-backed financial support for the improvement of the employment rate should prioritize three education indicators: scholarship benefits as a percentage of total individual spending on education, per-student spending, and the student-faculty ratio.

In particular, the government is advised to increase the weighting of these three indicators

It is recommended that the government recognize the employment rate as the principal indicator of the quality of education offered at higher education institutions and provide financial support for them with priority weights on the three indicators that have an empirically proven impact on the employment rate. In addition, it is crucial that higher educational institutions’ continued improvement in these three areas is monitored more closely.

when selecting universities for its financial support programs and monitor universities' performance in these areas closely. The government should keep in mind the finding that per-student spending indicator, when combined with the student-faculty ratio, results in an interaction effect that accelerates the improvement of the employment rate.

In addition, the results suggest that it is necessary to perform a thorough review of the current industry-academy partnership initiative, which encourages universities to employ industry professionals as teaching staff. Prior to applying the initiative to all universities, however, a pilot program should be implemented in the interest of verifying the effects of employing industry professionals as teaching staff, as well as addressing areas for improvement. Before moving forward with the widespread hiring of industry professionals as teaching faculty, further consideration is also suggested for new pilot programs regarding industry-academy cooperation, a strategy that enables an employer-responsive, demand-led approach to university curricula and improves the quality of teaching staff and educational facilities. ■

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