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Upgrading Higher Education in Korea: Context and Policy Responses

Cheonsik Woo

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Foreword

Under the new techno-economic environment of today's knowledge economy, knowledge, skills, and creativity play a more pronounced role for economic prosperity than ever before. The widening reach and impact of information technologies, the gathering momentum of globalization and trade liberalization, and the changing nature of work organization are all combining to create immense opportunities for the properly educated people with a proper set of human capital portfolio. As the quality of a nation's workforce is seen by many to be the key to national competitiveness and future economic prosperity, the task of 'upgrading of education' has emerged as the top national agenda in most countries.

Against this backdrop, a growing number of countries are exerting all-out efforts to improve the overall quality of their manpower through significant transformation of their education systems, including changes in financing and governance, cultivation of institutional differentiation, creation of evaluation and accreditation mechanism, and curriculum reforms. But progress has been uneven and sharp contrast remains across and within the education system worldwide. One commonly observed problem is that whereas the workplace and surrounding environment have undergone exponential change, education systems are undergoing only incremental changes. Though varying in degree and context, most countries continue to wrestle with some difficulties of their own, such as those arising from inadequate responses to a set of pre-existing and newly emerging challenges. Korea is not an exception, though Korea's situation is somewhat unique in many aspects.

Even as Korea managed to ride out of the 1997 financial crisis with better macro-fundamentals and an institutional foundation, Korea is expected to face formidable challenges in maintaining the present recovery momentum and making a successful transition to a more advanced knowledge economy. The overarching challenge for Korea in its post-crisis era is to secure new, reliable sources of growth and a competitiveness base. Korea's competitiveness base is just too shallow and limited to surmount great turbulence and throat-cutting global competition expected during the upcoming decades. Korea's future growth performance will depend more on technological progress and other intangible sources of growth that are accountable for total factor productivity, which calls for greater indigenous innovation capabilities and a more solid knowledge base as their supporting infrastructure. Because Korea's endeavor is to secure new sources of growth and pursue innovation-driven, knowledge-based development strategy, higher education has the utmost importance. Higher education is the very buttress of a nation's knowledge base, and, as the direct interface between education and all other sectors of a nation, is the very test bed of the overall quality and relevance of a nation's entire education system.

Korea's higher education has achieved spectacular quantitative growth and expansion over the past several decades. Indeed, the quantitative profile of Korea's higher education is astonishing and truly impressive even for the OECD standard. College education has become virtually universalized, with about 75 per cent of high school graduates advancing to colleges now. Indeed, as a result of the expansion and growth at an unprecedented rate, Korea has come to emerge as a country with one of the most extensive tertiary education sectors in the world.

Despite such impressive quantitative profile, however, there is a growing concern amongst Korean policy-makers, experts, and the general public alike, that its higher

education is seriously defective, unsuitable for meeting the challenges of the knowledge economy and lifelong learning. An indicative saying that captures the prevailing market situation and the general perception in this regard, is 'opulence in quantity, but paucity in quality'. Prevalent across all fields of occupations and industries are signs of 'over-education,' 'over-crowding,' and 'skills mismatch' problems associated with college graduates. A majority of firms and students report that college education is either irrelevant to or inadequate for meeting the ever diversifying and demanding skill demands at the business forefronts.

As most would agree, Korea's future as an advanced, knowledge economy will be bleak without successful upgrading of its higher education system. Without a quality tertiary education sector, it is impossible to meet the ever-demanding technological and manpower needs of Korean firms, not to mention those of foreign multinationals seeking a new regional platform in East Asia. Though not acutely recognized so in Korea yet, improved tertiary education is also pivotal for sustaining progress in Korea's basic education, which is the key to curing or alleviating the three long-standing maladies of Korean education system: 'private tutoring', 'test-oriented schooling', and 'college entry competition'.

Amid growing awareness of the importance of higher education, Korea has started to place greater policy emphasis on upgrading of its higher education system, with the focal policy objectives aiming to attain greater diversity and excellence through greater autonomy and responsibilities of individual institutions. Under the new policy impetus formed by the educational reform drive set off in the mid 1990s, many existing programs have been re-arranged and new programs have been introduced so as to induce and sustain self-motivated innovation efforts by individual institutes. However, all these new progressive changes have not been administered fully or have not rooted down yet. Although a growing number of institutions are responding to new policy initiatives, exerting sincere efforts to renovate and differentiate themselves one way and another, the accomplishments by this avenue remain very limited, and the concern and confusions over the future of Korean higher education remain very high.

Where does Korean higher education stand now? How much of its various reported problems are real and how much ill-grounded? What are the sources of its problems? Which problems are likely to be resolved by some policy measures? What is the overall prospect of Korean higher education and how can the requisite changes and transformation be made? These are the set of questions Dr. Cheonsik Woo attempts to address in this report. Certainly, the topic of educational problem is extremely complicated and intriguing, and we cannot expect any single piece of work to provide comprehensive and convincing answers to all these questions. Nonetheless, given the paucity of literature on Korean higher education, especially those addressing these questions from a systemic perspective that takes account of all relevant factors such as the changing patterns of industrial demands and labor market conditions, this report may be of unusual value as it fills in such gap.

I hope that this work by Dr. Woo will appeal to scholars and policymakers interested in seeking for a more balanced and comprehensive view on the present status and the future prospect of Korean higher education.

Choong Soo Kim
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Korea Development Institute

Contents

Foreword

Summary /1

CHAPTER 1 : Introduction /3

CHAPTER 2 : Evolution of Korean Higher Education: Historical Review /7

2-1. From Liberation until the Early 1960s / 7

2-2. The 1960s / 8

2-3. The 1970s / 10

2-4. The 1980s and until 1995 / 11

2-5. The 1995 Reform and Onwards / 13

CHAPTER 3 : Quantity, Quality, and the Sources of Problems /16

3-1. Quantity Expansion Unmatched by Quality Upgrading / 16

3-2. Problems with Regulation and Governance / 20

3-3. Problems with Financing / 22

CHAPTER 4 : Potential and Prospect to Make Transformation /33

4-1. Favorable Market and Policy Factors Peculiar to Korea /33

4-2. Significance and the Basic Direction of Prospective Changes /42

CHAPTER 5 : Policy Agendas Lying Ahead /45

5-1. Creating an Open, Contestable Higher Education Market /45

5-2. Realigning University Support Program for Specialization and Differentiation /46

5-3. Tapping onto Global Resources / 47

5-4. Digitizing/Informatizing of Education / 48

5-5. Reforming University Governance / 49

5-6. Revamping Legal Framework and Upgrading Information Infrastructure / 51

Appendix: Theoretical Models of College Entry Competition and Prisoner's Dilemma /53

1. Basic Model /53

2. A Simple Extension / 54

Annex Tables and Figures /57

References /69

Summary

Korea's higher education has achieved a spectacular quantitative growth and expansion over the past several decades. The quantitative profile of Korea's higher education is astonishing and truly impressive even for the OECD standard. College education has become virtually universalized, with about three-quarters of high school graduates advancing to colleges. Indeed, as a result of the globally unprecedented quantity expansion and growth, Korea has come to emerge as a country with one of the most extensive tertiary education sectors in the world. Despite such impressive quantitative profile, however, there is a growing concern amongst Korean policy-makers, experts, and the general public alike, that its higher education is seriously defective, unsuitable for meeting the challenges of the knowledge economy and lifelong learning. As the market is flooded with unemployed college graduates, signs of 'over-education' 'over-crowding' and 'skills mismatch' are prevalent across virtually all fields of occupations and industries. A majority of firms and students report that college education is either irrelevant to or inadequate for meeting the ever diversifying and demanding skill demands at the business forefronts. Despite the arduous reform efforts and variegated policy measures taken so far, the problems appear to persist.

In large, the deficiencies of Korean higher education may be viewed as stemming from the problems of over-regulation and under-financing. Korean higher education system has been heavily regulated by the state when compared to western countries, and remains highly centralized and inflexible to market needs. The deregulation efforts made since the early 1990s have not gone far enough or have not rooted down yet. Both the private and public universities lack autonomy in their management and academic affairs, with government regulations constraining them in recruitment and payment of staffs, student enrollments and admissions, fee levels, and so on. Essentially, the current relation between the state and the universities in Korea is the kind of administratively guided autonomy and administrative accountability system. As for the financing issue, virtually all higher education institutions in Korea have suffered from lack of resources. Korea spends the greatest portion of national income on higher education among the OECD countries now, but it still belongs to a group of countries that spend relatively less for each college student for their incomes. It may well be said that the expansion of Korea's higher education has been a seriously under-funded process, taking place to the detriment of the average quality. Government financial support for tertiary education has been very small, and private expenditure, mainly tuition, has been the main source of revenue in tertiary education. As a result, the overall schooling environment has become shamefully poor, with investment failing to keep pace with explosive increase in students body.

By many accounts, the upcoming decade will be an extremely turbulent period for Korea's higher education, marked by rapid demographic shifts and incessant changes of labor market conditions. The more urgent the task of upgrading the quality of its higher education becomes, the more Korea needs to take an objective and balanced view about itself. A growing number of countries are exerting all-out efforts to improve the overall quality of their manpower through significant transformation of their higher education systems. But progress has been uneven and sharp contrast remains across and within the education system worldwide. Though varied in degree and context, most countries continue to wrestle with some difficulties of their own, such as those arising from inadequate responses to a set of pre-existing and emerging new challenges. Taking into account such global context and trend, the present situation and prospect of future Korean

higher education may not be so frustrating and bleak as is widely perceived so within Korea. Despite the stock of grave problems it faces, Korea has the great potential to emerge as a leading knowledge-based economy of the 21st century, drawing on the assets within its tertiary education sector and capitalizing on various factors that could favorably affect its upgrading efforts.

First, an increasing number of countries around the world, whether developed or developing, are still struggling to build up or further expand their tertiary education sectors. In contrast, Korea is in the position to focus more on 'quality-reform', with quantitative expansion almost completed. Second, given the low burden of budget support for the basic education sector and the huge reservoir of private resources, Korea has the great advantage of bearing the huge additional investment costs needed to upgrade higher education without increasing the financial burden of the government or private sectors that much. Third, Korea's labor market conditions and underlying social and cultural environment have long been the critical factors that block out innovation and competition among institutions, thereby hampering progress towards greater diversity and higher quality. Amid Korea's economy-wide restructuring process since the latest financial crisis, however, the labor market is becoming more and more flexible, and new social and economic environments are forming up for open and fair innovation contest among higher education institutions. Forth, the widespread concern over the surplus of college graduates in the market is understandable, but may be over-subscribed. Korea's economic structure is already advanced enough to accommodate a substantially large body of college graduates. As Korea's industrial progress continues into the future, demands for college graduates will keep growing and diversifying, inducing a stable and large portion of high school graduates to continue to seek for higher education in turn. A substantial amount of additional demands will come from the existing workforce that seeks for continuing education at higher education institutions. Finally, quite meaningfully, fundamental changes have been made recently with respect to overall policy environments. With a bold organizational shake-up marked by the restructuring of the Ministry of Education in 2001, a new policy approach is anchoring so as to address educational issues in an integrated, general equilibrium framework together with a range of demand-side issues such as R&D, industrial development, workforce support, and et cetra. Most notably, a greater policy emphasis has been placed on higher education, especially on the university-industry linkage that holds a key to Korea's endeavor to upgrade its industrial competitiveness as well as higher education.

Although a set of favorable factors are in place or forming up, it will be a truly formidable task for Korea to successfully transform its higher education sector, capitalizing on those factors. The policy objectives of 'greater flexibility, diversity, and excellence' can be attained only through a series of fundamental, thorough, and systematic reforms. But no comprehensive reform blueprint has been offered yet. Although Korea is situated to focus on 'quality reform,' free from the burden of 'quantity expansion,' the over-expanded higher education sector of Korea itself poses a huge challenge for any comprehensive reform, since a substantial body of constituents needs commensurate full-scale actions. The basic approach needed for a successful transformation of Korea's higher education is a gradual restructuring and self-selective upgrading of the tertiary sector. With private institutions taking up a predominant portion of the market, Korea's higher education market is highly amenable to competition-oriented, market-based policies. The role of the state and the core objectives of the system reform that Korea need at the moment is thus to firmly establish a new market environment conducive to fair, innovative competition amongst schools and faculties where consumers' right to choose is guaranteed at maximum. Once such system is in place, some innovative schools will show up, and their influence and performance will gradually dissipate to other groups and organizations.

CHAPTER 1

Introduction

The Korean economy has recovered markedly from the financial crisis of 1997, and appears to have regained its capacity to move ahead along a new growth and development trajectory in the post-crisis era. Indeed, what Korea has accomplished in the wake of crisis management is quite “fundamental” and “impressive.” Through well-concerted efforts to rescue and restructure the corporate and financial sectors, much of the system-risk factors threatening the basic macro-viability of the Korean economy have been overcome successfully. Also, through comprehensive reform measures in areas such as labor market, public sector, and foreign trade, investments, and more, the overall market environment and incentive regimes have been greatly improved, making Korea more flexible, market-oriented and globally-integrated.

Table 1. Korea’s macro performance (1995-2002)

	1995	1996	1997	1998	1999	2000	2001
Growth Rate (%)	8.9	6.8	5.0	-6.7	10.9	9.3	3.0
Unemployment Rate (%)	2.0	2.0	2.6	6.8	6.3	4.1	3.7
Balance of Trade (million USD)	-10,060	-20,624	-8,452	39,031	23,933	11,786	9,341

Source: Bank of Korea, National Statistical Office

Even though Korea has managed to ride out of the crisis with better macro-fundamentals and an institutional foundation, Korea is expected to face formidable challenges in maintaining the present recovery momentum and making a successful transition to a more advanced knowledge economy. No doubt that Korea’s recent macro-performances are quite sanguine, especially when compared with its neighboring countries in East Asia. It is hard to say, however, that Korea is firmly back on a stable growth trajectory. While the ongoing recovery is largely driven by favorable domestic and external market conditions, those conditions are highly volatile and unsustainable, implying that Korea is not immune from another cyclical business set-back.

Actually, the vulnerability and instability of the Korean economy is of structural and long-term nature. While the upcoming decades or so will continue to be the period of great turbulence and throat-cutting global competition, Korea’s competitiveness base is too shallow and limited to cope with the challenges. Despite the surge-up of small, new technology-based firms after the crisis, Korean economy is still led by a few vanguard companies belonging to ‘Chaebols’. Although Korea’s trade balance switched into a sizable surplus in 1998, there is no ground to believe that it is because the competitiveness base of the Korean businesses has improved greatly.

The overarching challenge to Korea in its post-crisis era is reduced to the problem of securing new, reliable sources of growth. Korea has already reached the stage of development in which not only lower, but also more whimsical growth rates will be the norm. As is widely known, much of the impressive growth performance of Korea in the past was 'input-based', driven by putting-in of more capital and labor.¹ However, with the natural depletion of such input-based growth sources (labor and capital), Korea's long-term growth rate is deemed to decline. Korea's potential growth rate during the 1990s has already declined to 6.7 per cent from 8.0 per cent of the preceding decade, mainly due to a sharp fall in the labor-factor growth (from 2.6 per cent to 1.5 per cent). Such long-term trend will continue in the future. According to a long-term growth projection by Korea Development Institute (KDI), Korea's potential growth rate for the periods of 2000-2010 and 2010-2020 respectively are predicted to fall further down to 5.1 per cent and 4.1 per cent at best, and to 4.5 per cent and 3.2 per cent at worst. Setting aside the uncertainty associated with the volatile external condition, a critical factor here is the productivity-growth based on technological progress or advances. While Korea's future growth performance will depend more on such intangible, non-mechanical sources of growth, a high degree of uncertainty is involved here, because the technological progress, or, more broadly speaking, productivity-enhancing innovation, will be determined by Korea's yet-to-be-tested indigenous innovation capabilities and its underlying knowledge base.

Table 2. Potential Growth Rates and Sources of Growth in Korea

	1980-19 90	1990-20 00	2000-2010		2010-2020	
			High	Low	High	Low
Actual growth rate	9.1	5.7				
Irregular factors	1.1	-1.0				
Potential growth rate	8.0	6.7	5.1	4.5	4.1	3.2
Growth in Factor Inputs	4.5	3.4	2.5	2.4	1.9	1.7
Labor	2.6	1.5	0.4	0.6	0.2	0.2
Capital	2.0	1.9	2.1	1.8	1.7	1.5
Productivity Growth	3.5	3.4	2.7	2.1	2.2	1.5
Technological Advances	1.1	1.2	1.2	0.9	1.1	0.7

Note: In this analysis, the term 'productivity growth' consists of 'technological advances' (shown in the table), 'economies of scale,' and 'inter-sectoral re-allocation' (not shown).

Source: KDI (2001), Open society and flexible economy: Vision 2011 Project

The problem of securing new, sustainable sources of growth for Korea's future thus translates into the task of enhancing the knowledge base and innovation capabilities of Korean people and firms. Actually, along with economic restructuring, this constitutes another major thrust of Korea's new policy initiatives following the financial crisis, and there has been notable progress made in this regard. Not only did Korea succeed in correcting various imminent macro problems of the "old" Korean system, Korea also made considerable stride in harnessing the growth-base of its new system, setting out various new initiatives and programs geared to upgrade education, innovation, and ICT. Indeed,

1) For instance, while Korea enjoyed quite high potential growth rate (actual growth minus a irregular/cyclical factor) of 8.0% during 1980-1990, more than half of that growth came from labor and capital accumulation.

the latest financial crisis can be assessed as an epochal event that precipitated Korea's crossover from the old development paradigm of 'input-based growth' to a new paradigm of 'innovation-driven, knowledge-based growth'.

Because Korea's endeavor is to secure new sources of growth and pursue innovation-driven, knowledge-based development strategy, tertiary education has the utmost importance. Korea's higher education has achieved spectacular quantitative growth and expansion over the past several decades. When Korea gained independence from Japan in 1945, it had 4 multi-disciplinary universities² and 15 additional colleges, enrolling about 8,000 students in total. As of 2002, there were about 356 institutions in the higher education market, including 163 regular four-year universities, 159 junior colleges, and one open university. In these institutions, about 3.56 million students were enrolled altogether. Indeed, the quantitative-profile of Korea's higher education is astonishing and exceptional even for international standard. In terms of the enrolment rate, Korea stands atop in the world. About three-quarters of the high school graduates advance to colleges, and the gross enrolments rate for the ages 18-21 stands at 102.7 per cent in 2000. In short, as a result of spectacular quantity expansion and growth, attained over the past few decades, Korea has emerged as a country with one of the most extensive tertiary education sectors in the world.

Despite such impressive quantitative profile, there is a growing concern within Korea, amongst policy-makers, experts, and the general public alike, that the current higher education system is not suitable for meeting the challenges of the knowledge economy and lifelong learning. A typical term that characterizes the present situation of Korea's higher education market is 'opulence in quantity, but paucity in quality'. Widespread across all occupational fields is the skill-mismatch between the supply and demand of college graduates. A majority of firms and students report that education at school is either irrelevant to or not good enough for skill demands of jobs.

Despite the arduous reform efforts and variegated policy measures taken so far, public discontent with the Korean education system remains very high. By many accounts, the upcoming decade will be an extremely turbulent period for Korea's higher education, marked by rapid demographic shifts and incessant changes in labor market conditions. As most would agree, Korea's future as a knowledge economy will be bleak without successful upgrading of its higher education system. Without quality tertiary education, it is impossible to meet ever-demanding technological and manpower needs of Korean firms, not to mention those of foreign multinationals seeking a new regional platform in the East Asian market. However, it appears that no persuasive views have been put forth yet within Korea, as to the questions of: what are the sources of Korea's educational problems; how can they be solved; and how can the requisite changes and transformation be made. Certainly, educational problem is extremely complicated and intriguing, and it is not easy to find satisfactory answers to these questions. But a good starting point may be to pursue a more balanced and comprehensive view of Korea's higher education, identifying its strengths and weaknesses in consideration of all relevant environment factors including industrial demands. This paper wants to contribute to this aim.

The rest of the paper is constructed as follows. Section 2 briefly goes over the expansionary process of Korea's higher education, together with the evolution of relevant policies. Korea's higher education, it will be claimed, has changed largely in tune with the overall development stage of the Korean society until the late 1970s. Since then, however, they failed to respond or adjust to new and more sophisticated needs of the ever-maturing Korean society. Section 3 addresses the problem dimensions of Korea's higher education. After pointing out that its quality is not up to market demands as much as people expect,

2) Seoul National University, Yonsei University, Korea University and Ewha University

the section looks into regulatory framework and financing structure of Korea's higher education as two major sources of the problems. Section 5 discusses the prospect of development of Korea's higher education, together with the basic approach and policy directions in need. The section argues that the future of Korea's higher education may not be so bleak, and that actually many favorable factors are already at play around higher education market, because those factors will help Korea attain a gradual upgrading of its higher education through market-based, self-selective competition for greater diversity and differentiation. Section 5 sets forth some specific policy suggestions. A panoramic coverage of all outstanding agendas is beyond the scope of this paper. Focusing on selective issues related to regulation and financing only, the section will also comment on big remaining reform issues of Korea's higher education such as reforming of university governance system. Appendix introduces simple game-theoretical models of college entry competition and investment choice. Severe entry competition and huge, private after-school education ('Gua-Woi') are the two most notorious problems of Korea's education. Showing how these problems are related to the college premium, this appendix illustrates that problems have some characteristics as in a typical prisoner's dilemma problem, and could go away if the college premium is reduced through successful upgrading of Korea's higher education. The models are just illustrative, and produced here to emphasize that further research along this formal analytical approach is badly in need.

CHAPTER 2

Evolution of Korean Higher Education: Historical Review

During the last few decades, increasingly larger numbers of students are seeking higher education in developing countries as well as in developed countries. For Korea, one of the most rapidly developed middle-income countries in the second half of the last century, the expansion of higher education has been particularly spectacular. In 1950, the number of students enrolled in higher educational institutions was about ten thousand. Fifty-two years later in 2002, the number was increased to more than 3.5 million. Currently, more than 95 per cent of 18-year-olds graduate from high schools, and about 75 per cent of the high school graduates advance to higher education. Currently, Korea's enrollment rate in higher education is among the highest in the world. Indeed, as a result of spectacular quantity expansion over the past few decades, Korea has come to emerge as a country with the most extensive tertiary education sector in the world. Currently, there are 159 two-year colleges (colleges hereafter) and about one million students are enrolled. There are 163 regular 4-year colleges and universities (universities hereafter). In addition, there are 11 national teachers' colleges, and 19 industrial universities. Excluding more than 370,000 students in the Korea National Open University, there are 2 million students enrolled in 4-year universities altogether.

This section briefly reviews and characterizes the expansionary process of Korea's higher education together with its policy development. We will cover the entire period since the Liberation in 1945, although the focus will be on relatively more recent periods when Korea set out on serious efforts for industrial and educational development. This entire period can be usefully divided into five sub-periods: (i) the period before 1960, (ii) the 1960s, (iii) the 1970s, (iv) the period between 1980 and 1995, and (v) 1995 and onwards.³ Although we will be primarily interested in the facts and policies related to higher education, those related to basic education will be touched upon, to the extent they help proceed our discussion on higher education.

2-1. From Liberation until the early 1960s

This is the system-building period of Korea as a new independent nation. Amid all disorder, chaos, and ravages incurred by the unexpected partition in 1945 and the ensuing Korean War, Korea managed to establish the basic structural and administrative tenets of its own education system, rapidly expanding the educational opportunities virtually at all levels of education, including higher education.⁴

3) As will become clear, this period-classification corresponds largely to the typical phase-classification of Korea's industrialization process. A comprehensive and analytical recounting of the historical process of Korea's economic development since liberalization can be found at KDI(1996). A short, synoptic review focusing on industrial dimensions can be found at Woo (1998) or Woo (2001c). As concerns the Korea's educational development until mid 70s, a substantial volume of detailed and comprehensive studies is available already (for instance, McGuinne et al. [1980]). Thus our discussion of this period will be limited to the minimum essentials.

4) In terms of economic performances, this period can be divided into two sub-periods: 1) the 1945-1953 period of instability and destruction; 2) the 1954-1961 period of reconstruction and mild expansion during which the economy managed to grow modestly, drawing primarily on the foreign aid.

Building up of higher education started with the reorganization of Kyungseong Imperial University into Seoul National University (SNU), the first national university of Korea built on the American university model. It was the first comprehensive modern Korean university that had undergraduate and graduate degree programs ranging from engineering to medicine, and from physics to English literature. Similarly, several private higher learning institutions were organized into American style universities. The most important educational objective of the government during this period was to achieve universal primary schooling as quickly as possible, and there was an urgent need for quick, massive provision of teachers. The government established several schools to train teachers in major cities throughout the country. In order to produce teachers as quickly as possible, these schools charged no tuition.⁵ Meanwhile, many new private universities were established immediately after the independence. The number of higher learning institutions had increased from 19 per cent in 1945 to 55 per cent in 1950.

The Korean War halted the growth of the higher education sector. The War forced most universities located in Seoul to seek refuge in the southern provinces. During the war, several universities conducted classes in provincial cities, such as Busan and Kwangju, sometimes as a consortium. While the effectiveness of this temporary teaching arrangement may be questionable, the War confirmed the feasibility of higher education in those cities. This experience has become the basis for the national university system in Korea. During the period of 1951-54, at least one national university was established in each province of Korea.

The higher education system expanded very rapidly under the Rhee Sungman government. However, as the government concentrated its financial resources on primary education sector and national universities charged substantial tuition, the increased supply of higher education was fulfilled mostly by private universities.⁶

2-2. The 1960s

This period largely corresponds to the 'take-off' phase of the Korean economy. The export-oriented development strategy was successfully launched, paving a way for all ensuing years of high growth and rapid industrialization.⁷ This period witnessed another impressive quantitative expansion of Korea's educational base, especially in basic education. The elementary school education had become universalized by the late 1960s, and the middle school education had been expanded exponentially so as to accommodate the increasing cohort of primary school graduates.⁸

The basic orientation of educational policies and the role of the state changed greatly. The previous Rhee regime allowed the education sector to expand freely, satisfying educational demand of the Korean people. In contrast, the new government of President Park was more concerned about the quality of education, and thus systematic efforts to

5) Initially, teachers colleges were set up at secondary level. Most of them became 2-year colleges during the early 1960s, and then 4-year universities during the early 1980s.

6) The enrollment increased from 11,358 in 1950 to 101,014 in 1960.

7) It is generally viewed that the take-off stage of Korea covers the period of 1962-73. In 1962, the first 5-year economic development plan was launched, and in 1973 the government abruptly switched to the new development strategy called HCI drive. (See Appendix Chart1)

8) The middle school enrollment rate has risen sharply from 33 per cent to 51 per cent over 1960-1970. All these rapid expansion of basic education was supported by markedly stepped-up funding efforts of the government. Setting up the Five-Year Educational Reconstruction Plan (1962-67), the new government of the President Park channeled increasingly large amount of government budget to education. The share of education budget in total central government budget rose from 12% in 1961 to 17% in 1970. Although the share in GNP has not increased over this period, stagnating in 1.6%- 2.8% range, the explosive economic growth that has taken place during this period implies that the total amount of resources dispensed for education has increased quite substantially.

raise the 'manpower supply' of the entire education sector to the industrial manpower demand level were made and institutionalized.⁹ As well couched in the 'Five-Year Educational Reconstruction Plan' (1962-1966)¹⁰, the efficiency of educational investments - efficiency in facilitating the development strategy based on intermediate technologies and manpower - became the basic guideline for disbursing educational budget. While such new emphasis on efficiency was clearly reflected on the continued efforts to reduce adult illiteracy and enhanced efforts to improve the quantity and quality of primary education, this policy shift was felt most acutely in respect of policies on vocational schools and higher education.

As the government embraced the education-for-manpower-needs concept, and as the skills demand started to rise rapidly with the new industrialization process underway, vocational education newly gained a major emphasis. Junior technical colleges began in 1963 as a post-middle school, a five-year professional training program. In efforts to expand and improve vocational high school quickly, the government disbursed disproportionately large amount of resources to this sector, also introducing various special incentives.¹¹ As a result, enrollments in vocational secondary schools have increased substantially since 1965, far outpacing the growth of the academic high schools.¹²

When the systematic manpower planning started in 1963, Korea appeared to face a serious oversupply of college graduates, with reportedly a vast number of them unemployed or down-employed.¹³ Also, corruption-ridden management practices of many private universities came to make a social problem.¹⁴ The new government thus shifted its basic policy stance on higher education from laissez-faire (of the previous regime) to tight control, enacting and implementing various measures aimed at suppressing college enrollments as well as coping with the mal-practices of private institutions.¹⁵ Enrollment quota was established for each university at the departmental level. Appointment of professors was strictly controlled as well. Ministry of Education gained strong control over the establishment and expansion of private universities as well as national universities.

9) With the establishment of the Park regime in 1961, local school boards were abolished and the control of the educational system was further centralized. Under the preceding regimen, the priorities of education policies were placed on individual knowledge and moral development, and especially anti-Communist education. In contrast, Park's government gave first priority for education to exemplify "socio-economic development, with concentration on educational productivity and technical education."

10) This plan was prepared as an integral part of the First Five-Year Economic Development Plan.

11) The share of expenditure on industry and science in the Ministry of Education budget increased from 0.8% in 1965 to 3.0% in 1969. In an effort to overcome traditional psychological resistance to vocational education, the Ministry of Education has offered special incentives to students, including handsome scholarships and promises of employment (and has allowed private schools to expand more rapidly than public).

12) Serious endeavor to nurture manpower with specific industrial skills started with the launching of the second five-year plan (1967-71). Over this period, the major policy target gradually shifted onto more skill-intensive industries (such as chemical, machinery and steel) and the skill demand started to rise rapidly. In 1967 the 'vocational training law' was legislated. Besides formal schooling at vocational high school, various forms of non-formal educational or skill-training programs, each with distinctive characteristics, were introduced.

13) In 1960, the estimated unemployment rate of college graduates was as high as 60 per cent. The 1964 projection by Economic Planning Board of Korea and other projections by some foreign organizations such as UNKRA and FAO later on consistently predicted a chronic and serious oversupply of the college graduates in almost all occupational categories such as scientists, engineers, professionals, and craftsmen. This oversupply of college graduates actually dates back to 1953. Between 1950-53, the number of students pursuing higher education (allegedly for the draft-dodging reason) increased dramatically, and university enrollments mushroomed, as private colleges sprang up over the countryside.

14) Though the private universities have the boards of trustees, many private universities, particularly the newly established ones, are under the strong control of the founder or his/her family. Though all private universities are *de jure* non-profit organizations, many operated with substantial profit motives. Consequently, there were many incidences involving inappropriate practices of funneling school fund into the *de facto* proprietors.

15) The 'Provisional Special Act on Education'(1961), 'Private School Act' (1963), and 'Enforcement Decree for College Enrollment Quota' (1965) were all enacted to this aim.

Although college enrollments initially declined in absolute number, they began to climb up soon again and quite steeply since 1967. In 1969, the government stepped up its enrollment control efforts, this time by introducing a mandatory national college-entrance test designed to screen out the under-qualified applicants,¹⁶ but such measure turned out to be ineffective. Once again, the rates of growth in college enrollment soon bounced back to more than 10 per cent per annum. Overall, despite the government's tenuous efforts to limit its expansion, tertiary education sector had expanded sizably over this decade: the enrollment rate rose from 6.4 per cent in 1960 to 8.4 per cent in 1970.¹⁷

2-3. The 1970s

This period largely falls on the HCI (heavy-chemical industry) drive phase in the Korea's industrialization process. In 1973, the government abruptly switched from the previous policy of general export promotion to a more selective, and intervention-oriented development strategy that focused on HCIs. Withstanding all adverse external shocks such as two oil shocks and all the negative effects of, arguably, the over-ambitiously-pursued HCI drive itself, the Korean economy managed to sustain its high growth momentum.¹⁸

During this period, by and large, Korea experienced another impressive expansion and deepening of its educational base, which more than paralleled its impressive economic growth. The most notable feat was made in the aspect of secondary education. With entry exams abolished, middle school had been virtually universalized by the end of the 1970s (enrollment rate almost doubled from 51 per cent in 1970 to 95 per cent in 1980), and high-school enrollments had more than doubled (enrolment rate increased from 28 per cent to 63 per cent) under the new impetus of high school equalization policy.

As concerning educational policy, the central-planning approach to education persisted somewhat, although it gradually weakened in time. The government continued to try managing and controlling the entire educational sector so that 'educational supply' would well match the changing manpower needs of the industries.¹⁹

16) This test started as the qualifying exam for college education, with only 1.5 times as many applicants as the total college entry quota allowed to pass the test. The students who passed this test then took the main entry test administered by each individual university. Since its introduction as a pure qualifying test, the nature of this preliminary entry test has changed in such a way that the result of this test itself becomes a determining factor for college entry. This trend culminated in the 1980 Education Reform, which imposed all universities to select their students based on this test only.

17) Actually, in the presence of large excess demand for higher education, the strict entry quota imposed by the government only led many universities to be engaged in rent seeking activities, particularly in regards to the expansion of enrollment. Also, as the quota was restricted to the departmental level there was wide variation of the discrepancy between the market demand and supply among different disciplines.

18) The HCI drive started with the promulgation of the HCI Development Plan in 1973. Its proponents typically maintain that it was a logical response to a set of impending challenges (e.g. rapid increase in domestic wages, increased global competition in traditional export market), and more or less a successful and timely policy shift that laid down a new ground for another sustained growth of the 1980s and onward. For a highly sketchy description of HCI drive and polemics surrounding its effects, see Woo(1996). A more detailed and comprehensive study can be found in D. Perkins et. al. (1995).

19) Overall, the limitation of the government control of the education sector in accordance with long-run manpower forecast started to show up in early 1970s. In 1969, the National Council for Long-Term Educational Planning (CLEP) was established under the chairmanship of the Prime Minister. This council produced a draft 15-year plan (1972-86) that included an analysis of natural development trends and their implications for education, as well as current educational problems. The plan made quantitative projections of enrollments, demand for teachers, and physical and financial requirements at minimum and maximum levels. Priority was given to expansion and development of secondary and higher education including innovative expansion of graduate education. The new Minister of Education in 1971 decided to replace the CLEP with an Educational Policies Council. This council, established as an advisory body for the Minister, has emphasized relatively short-term policies. With CLEP abolished, interest in continuous long-term planning has declined.

During this period, the emerging chemical industries began to demand more and more of skilled-workers and mid-level technicians. In this context, the government deliberately promoted vocational high school education.²⁰ Not only was its overall capacity expanded, but its quality also improved discernibly, owing especially to the successful implementation of the so-called "categorization of technical high schools" guideline (1974-1978). In efforts to nurture the mid-level technicians needed for more sophisticated technical jobs, a host of low-quality junior-college level institutions were unified or reorganized into a new junior technical colleges system. The government policy was very successful at least in increasing enrollments at this segment of tertiary education. During 1970-1980, the enrollment share of junior colleges in total tertiary sector had risen from 17.2 per cent to 26.9 per cent, virtually all of which took place during the second half of the 1970s.²¹

Alongside junior colleges, the university-level education had expanded substantially as well. By the early 1970s, the decade-old government policy of tightly controlling college quota continued to hold, so that tertiary enrollments would not grow that much.²² Moving into the mid-70s, however, the gaining perception was that the continued industrialization efforts took more 'high-quality manpower'. Also the pressure to accommodate strong social demand for higher education continued to build up. Responding to these changing environments, the government's long-standing position of strict enrollment control began to change. Starting with a modest relaxation of quota in 1973, the quota of higher education enrollment had been drastically expanded through the rest of the decade - first for sciences and engineering fields and then for all other fields of higher education. In consequence, tertiary enrollment rate, which was stuck at 9.3 per cent in 1975, soared up to 15.9 per cent by 1980.²³

For all the impressive expansion of secondary and tertiary education, however, the government spending on education had not increased commensurately. Throughout this decade, the shares of education budget, in total government budget as well as in GNP, remained lower than the 1970 level. While parents took up much of the burden of financing this spectacular educational expansion, some sacrifice of quality was inevitable. By the late 1970s, the serious quality degradation in higher educational institutions started to loom up, especially with the rapidly expanded junior technical colleges.

2-4. The 1980s and till 1995

This period is often depicted as the coming-of-age, maturing phase of Korean economy. Although a series of turbulent internal and external problems sprang up and often persisted, putting the sustainability of the 'Korean Miracle' itself under question, Korea managed to surmount those problems somehow, consolidating its position as a newly industrialized, mid-income country in the global economic scene.²⁴

20) In 1973, the 'Industrial Education Enhancement Act' was revised. The share of expenditure on the industry and technology-related fields of education in the government education budget increased from 2.6% in 1970 to 4.1% in 1979.

21) During 1975-1980, the entry quota for all junior colleges combined has increased by 25% on average per annum.

22) The enrollment rate has increased from 8.8% in 1970 to 9.5% in 1975. Apparent oversupply of university graduates continued. According to the 1974 UNESCO report, for instance, unemployment rate of engineering and applied sciences majors was 40% in 1972.

23) In order to accommodate the rapidly rising demand for higher education, Korea National Open University was established in 1972 as a division of Seoul National University. In 1982, it became an independent institution.

24) The real GDP growth during this 17-year long period was 8.44% - which is higher than in the 1970s (7.6%) and the 1960s (8.39%).

In the field of education, many notable changes occurred during the 1980s. The long-pursued governmental goal of universal secondary education was finally accomplished with the middle-school enrollment rate reaching 100 per cent around 1985.²⁵ The high school education continued to expand quickly as well, especially throughout the 1980s, with the enrolment rate rising to 88 per cent in 1990 from 63 per cent in 1980. With the enrollment rate standing as high as 90 per cent in 1995 and still creeping up, virtual universalization of high school education may well be anticipated.

The educational sector that experienced the most drastic and quite dramatic expansion in this period was higher education. As mentioned already, higher education started to expand steadily since around the mid 1970s, as the government loosened up college enrollment control. Nonetheless, the basic policy stance remained to curb the uncontrolled expansion of college sector. Most of the expansion thus was limited to junior colleges and engineering and sciences fields of university system. Now all these changed dramatically in 1980. The new government of President Chun announced an arguably heroic educational reform plan (known as the 7 · 30 Education Reform), two prominent agendas of which called for a quantum increase in the entry quota of university (60 per cent increase over one year), and the outlawing of virtually all 'Gua-Woi' activities. This reform had a seismic impact on the quantity of higher education. In 1981, when this new reform measure was first effectuated, university enrollments jumped up and continued to rise rapidly into the mid 1980s. Tertiary enrollments ratio, as a result, more than doubled to 35 per cent in 1985 from 16 per cent in 1980.²⁶

As the first wave of this vigorous expansion largely was subdued in the mid 1980s, another expansionary wave had set in towards the end of the 1980s. This wave, still on its way of unfolding, differed from the first wave in two crucial aspects. The first expansionary cycle started by the one-time disruptive jump in the entry quota in 1981 and was centered on the fields of liberal arts and social sciences. In contrast, the new expansion came as a result of a moderate but steady increase in the entry quota, with the main areas of expansion being junior colleges and sciences and engineering fields. As a result of this still-on-going second expansion, tertiary enrollments rate rose further to 54.6 per cent by 1995.

In retrospect, the 1980 Education Reform can be viewed as a critical juncture in the history of the Korea's educational development. Through the reform, the old 'education for economic growth' view was staged out and the new 'education for the sake of its own purpose' view set in. What the 1980 Reform emphasized was not economic efficiency of educational investments, but individual right to education and quality of education.²⁷ Maximum absorption of all educational demands became the new policy norm. Fatally missing in the 1980 Reform, however, was a realistic vision or grand policy frame

25) In 1985 the government announced a long-term plan to make now-universalized middle-school education compulsory. This goal came to be attained in 2001, with the government decision to provide free middle school education starting with the incoming class of 2002.

26) In this vein, many 2-year national teacher colleges and technical colleges were transformed into 4-year colleges. The government increased the admission quota with the condition that the university has to drop certain portion of students before graduation criteria. The justification of the change was the concern on the quality of higher education. It has been pointed out that university students did not work hard as soon as they got into the university, while they had to spend a great deal of time, effort, and financial resources in private tutoring as well as in regular schooling in order to enter the university. Although the "graduation quota" was introduced to cure this problem, it was enormously unpopular to professors and university administrators as well as to students. It was politically impossible that the government could enforce the graduation quota, and the policy was rescinded a few years later resulting in effective increase in the admission quota.

27) Besides drastic enlargement of college education opportunities, the 1980 Reform contained other reform measures fitting this new view of education: Legal basis for the promotion of life-long education were made and reforms in curriculum and teacher training system were legislated all for the purpose of advancing educational quality.

concerning how the proclaimed lofty goal – provision of quality education to all willing individuals – could be attained. Although the government stepped up its funding efforts by, for instance, introducing new special education tax (1984), such efforts were by far insufficient to meet the huge resource requirements needed to provide quality education for the populace. Since 1980, the conflict between the quantity and the quality became most acute and almost intractable. Given the obvious limit of government and private sectors' ability to mobilize sufficient funds, it was inevitable that the average quality of higher education deteriorated sharply as a disruptively large number of students flowed into this very resource-demanding education sector. Burgeoning of tertiary education in Korea thus came with unwelcome, but unavoidable by-product – the 'secondarization of tertiary education'.

While all ailing effects of the 1980 Reform became ever more acute, the old instrumentalist view of education rolled back in around the late 1980s. With the Korean economy struggling amid escalating wages and ever-intensifying international competition, manpower once again was hailed as the ultimate ground of the national competitiveness, and the role of school as a venue to produce competent manpower befitting industrial needs regained a top policy emphasis. Vocational and technical education in high schools, which was ignored and stagnated during 1980s,²⁸ was strengthened and promoted again. Entry quotas for junior colleges as well as sciences and engineering fields of university were enlarged sizably, whereas the quotas for other fields of tertiary education were tightened again.

Amid all these renewed efforts for selected promotion, a packet of reforms in a quite innovative line had emerged: reforms geared for 'decentralization' and 'liberalization'. By the early 1990s, a general consensus was forged up in Korea: that the deficiencies of Korean education could not be resolved without a fundamental reform of the basic tenet of school governance structure. 'Democratization of education' became a watchword among students, parents, and educational practitioners. Reforms and experiments to decentralize and deregulate the Korean education system thus started.²⁹

As for primary and secondary education, local control of education was re-introduced in 1991 after around 30 years of actual suspension. Decentralization policy in the management of school curriculum was also realized to a certain degree under the 1991 national reform of school curriculum (6th of the kind). As for higher education, autonomy and competition came to be perceived as the primary vehicle for quality enhancement, and a set of new incentive measures such as the accreditation system of college education and differential financial support based on performance evaluation were introduced. Moving towards the mid 1990s, this new line of reform and experiments came to make one of the principal thrusts of Korea's educational reform efforts, as clearly reflected in the new reform move that started in 1995.

2-5. The 1995 Reform and onwards

Since 1995, a series of bold and comprehensive reform programs, prepared by the Presidential Commission for Educational Reform (PCER hereafter), were implemented

28) Throughout 1980s, the proportion of vocational education budget in the total Ministry of Education budget has declined from 4.1% in 1979 to 3.4% in 1988. Also the enrollments share of the vocational high school fell from 41% in 1981 to 32% in 1989.

29) Already as late as back in 1987, the Council of Education Reform prepared 'the Comprehensive Plan for Education Reform', which contained a number of key agendas of the latest reforms. But differing from the reform proposals by the PCER, the earlier plan did not have concrete implementation plan and thus was not translated into actual policies. For more detailed description of this earlier reform plan, see Yoon (1993).

with full enthusiasm and vigor.³⁰ Unlike most of the preceding reforms, the PCER reforms put more emphasis on deregulation and decentralization as a vehicle to alleviate the allegedly deep and widespread deficiencies of Korean education system.

Following the recommendation of PCER, the government further loosened up regulation on higher education. Among other things, private universities were given greater degree of freedom in terms of setting the number of incoming class as well as the distribution of students within the institution.³¹ Also, establishment of new schools was liberalized, allowing any institutions meeting minimum standards to set up schools freely. The regulation on student admission was liberalized as well: private universities were allowed to choose any screening criteria or procedures to select students.³²

All these deregulatory measures were intended to make the institutions of higher education more autonomous and to induce active competition among them for excellence and differentiability. To precipitate competition, the government introduced discriminatory subsidy policy based on comprehensive evaluation of universities and programs.³³ A portion of the government financial subsidy to universities was allocated based on the evaluation of reform efforts of individual universities

Table 3. Policy Agendas for Korean Higher Education since the 1995 Education Reform

1st Proposal (May 31, 1995)	
-	Strive for greater diversity and differentiation of higher education
-	Deregulate establishment of new institutions (a criterion-based, automatic approval system)
-	Deregulate enrolment quota
-	Strengthen evaluation and buttress evaluation-based financial support scheme
-	Introduce academic credit accounts system; encourage part-time registration and transfer between programs and institutions
-	Support for internationalization of research and operation of overseas branches and programs
-	Improve college admission system
-	Introduce new independent graduate schools in specialty fields such as international relation
-	Increase education budget up to 5 per cent of GDP
2nd Proposal (Feb. 9, 1996)	
-	Invent new admission systems for junior college and Korea National Open University
-	Improve the quality of vocational education at junior college, industrial univ, and technical college
-	Promote the establishment and operation of the "new" types of undergraduate and graduate programs for expanded adult and continuing education

³⁰ Including the first proposal announced on May 31, 1995 (5 · 31 Reform Proposal), four proposals have been announced (the last June 2, 1997) and implemented during the President Kim Young Sam. Eventually, the contents of the four proposals were translated into 120 policy agendas in 4 areas, including 56 agendas in the area of basic education, 19 agendas in higher education, 23 agendas in continuing and vocational education, and 22 agendas for overall policy framework and infrastructure. The PCER was set up as a non-bureaucratic civilian body, composed of academics, experts, and civic leaders, and was responsible for preparation of the reform proposal or blueprint. It was the Committee for the Promotion of Educational Reform, composed of 11 Ministers related to educational reform, that was responsible for the implementation of the proposal. In addition, a special task force installed at the Executive Office assumed an important role of coordinating the position and views of PCER and the Promotion Committee. For a detailed discussion of the organizational and managerial scheme of the 1995-1997 education reform and a succinct assessment of its characteristics and limitations, see Se-II Park (1999).

³¹ However, the schools in the Seoul metropolitan area still have to get explicit permission from the Ministry of Education in compliance to the decentralization policy.

³² For national universities, however, individual written entrance examinations except for essay tests were banned.

³³ Likewise, MOE began to transfer some financial resources to provincial educational governments based on their performance.

<ul style="list-style-type: none"> - Improve the national college admission test in preparation of a new secondary school curriculum - Introduce new professional school system in the areas of law and medical sciences. - Promulgate new Higher Education Act
3rd Proposal (Aug. 20, 1996) <ul style="list-style-type: none"> - Reform teachers college system - Enhance capacity of private institutions for greater autonomy - Encourage professional management of private institutions - Strengthen support to private institutions through financial, fiscal and tax measures - Promote cyber-university and other forms of futuristic schools
4th Proposal (June 2, 97) <ul style="list-style-type: none"> - Strengthen support for greater excellency and local-linkages
New policy initiatives since 1998 <ul style="list-style-type: none"> - Introduction of BK21 for greater excellency, diversity and local-linkages - New college admission system from 2002 - Efficiency reform for general national universities - Greater autonomy and accountability of higher education institutions

Source: PCER (1996) and OECD (1998)

The basic orientation and principal agendas of the 1995 and ensuing reforms carried over to the new government of President Kim Dae-Jung without significant alteration, bringing about discernable impact on the quantity of higher education. With the enrolment quota lifted except for the universities in Seoul metropolitan area, many private universities located elsewhere increased their enrollment, as the increased enrollment directly translated into higher revenue. Also, under the new policy of liberalized market entry, not only were many small private universities established outside Seoul area, but most of the big universities based in Seoul also established their branch campuses³⁴. Although the new policy limited especially in quantity-expansion, it induced quality competition in the higher education market. As the performance-based budget support came to make an important component of financing policy, many institutions started to exert various efforts to restructure and upgrade their operation.

Rapid expansion of higher education supply in the nineties was soon to be faced with declining demand generated by demographic factors. As the number of high school graduates started to decline with the enrollment rate of higher education already very high, the demand for higher education was expected to decline in the near future. This would create huge financial pressure to many universities, especially those outside of Seoul area. Nonetheless, as argued in the next section, the market environment was ripe for a competent, innovative institution to differentiate itself and prosper under a new government support scheme. By many accounts, the 1995 reform is regarded to mark the shift in the paradigm of Korea's higher education policy, which created both opportunities and challenges in Korean higher education.

³⁴ For example, Yonsei University established a branch campus in Wonju, Konkuk University in Choongju, and Hanyang University in Ansan. (As of 2002, there are 19 local campuses in total)

CHAPTER 3

Quantity, Quality, and Sources of Problems

3-1. Quantity Expansion Unmatched by Quality Upgrading

Korea has accomplished a truly astonishing feat in laying down a foundation for the mass provision of highly educated workforce. Through the continued, and remarkably fast expansion of higher education sector, college level education has become virtually universalized. Around three-quarters of the high school graduates advance to colleges, for which 4-year university accounts about 60 per cent. The gross enrolment rate for the ages 18-21 stands at 102.7 per cent in 2000 (see annex table), and the college entry quota has come to exceed the number of high school graduates.

Table 4. Proportion of the Educated Population by Nation

(Unit: %)

Proportion of the educated population			Korea	Japan	US	Germany	France	UK
High School Education and Above	Ages 25~34		92	93	88	88	75	63
	Ages 35~44		70	91	88	87	63	62
	Ages 45~54		45	77	87	84	56	58
	Ages 55~64		27	57	80	76	41	53
College Education and Above	Ages 25~34		34	45	36	22	30	26
	Ages 35~44		23	40	36	26	20	25
	Ages 45~54		12	23	37	25	18	23
	Ages 55~64		8	13	27	19	11	17

Note: Due to differences in education systems, the range covered for high school and above differs for France and the UK.

Source: OECD, *Education at a Glance*, 2000

As widely acknowledged, there is no doubt that fast expansion of higher education has been instrumental to Korea's successful industrial upgrading and economic development over the past several decades. However, there is a general and deep sense of crisis inside Korea, regarding the present status of its higher education and the college graduates. In essence, both the quantity and quality are the subjects of great concern. As the labor market is flooded with college graduates, the symptoms of 'overcrowding,' 'over-education,' and 'skill mismatch' are prevalent. According to one study, about 30 per cent of the junior college graduates and 46.5 per cent of university graduates find jobs that are indirectly related or unrelated to their fields of specialty at school. In addition, a substantial body of the graduate ends up with jobs that do not require the college level of education at all (30.1 per cent for junior college graduates, and 37.4 per cent for university graduates). Worse, "Job mismatch" problem appears quite severe too. Although the unemployment rate of

college graduates is not so high, a substantial portion of college graduates reportedly stay “idle”, not joining the labor market at all.³⁵

Table 5. Skill-mismatch problems of higher education graduates

(unit: %)

	Education level	Excessive	Adequate	Deficient
Adequacy of Schooling Level	High school or under	32.2	67.5	0.3
	Junior College	32.7	64.7	2.6
	University	46.5	53.5	0.0
	Total	34.0	65.3	0.7
		Not Relevant	Relevant	No Response
Relevance of Fields of Study	High school or under	32.8	66.7	0.5
	Junior College	30.1	68.0	1.9
	University	37.4	61.6	1.0
	Total	32.9	66.3	0.8

Note: The numbers in the table denote the percentage of the respondents, asked to answer the questions of “Is your education level appropriate for your job (education level)” and “Is your field of study at school relevant to your job (fields of specialty).”

Source: Korea Labor Institute, ‘Korea’s working households panel’, 3rd year additional study on the youth, 2000

Regarding the usefulness of schooling in actuality, across all spectra of occupational fields, a substantial portion of both employers and students have been reported to find college education inadequate for skills demand in the market. Various survey results available at the moment indicate that many workers feel what they learned in school is only partially utilized and hence not adequately useful at work.³⁶ Managers also warn that, while the demands for education has become greater, the existing school curricula are becoming less relevant to the world of work. In one recent survey, managers and workers were asked to rank the level of mismatch of skills acquired in school and those required in workplace. As the table below shows, a majority of workers and managers perceive the discrepancies to be quite wide.

³⁵) About one third of the university graduates are reported to stay idle (see Annex Table A7)

³⁶) Workers typically report that computer and ICT skills were inadequately taught at school; English and foreign language at medium to low; basic knowledge and skills including mathematics, logical skills, composition and problem solving, and teamwork skills at medium to low.

Table 6. Perceived difference between skills/competence acquired in colleges and those required at workplaces (% of respondents)

(Unit: per cent)

degree of difference	1	2	3	4	5	Total (# respondents)
Personnel managers	2.2	13.4	43.6	34.5	6.2	100 (417)
College graduates	1.6	9.5	23.5	53.4	12.0	100 (442)

Note: 1 indicates no discrepancy; 5 indicates the widest discrepancy

Source: Korea Research Institute for Vocational Education and Training (KRIVET), 2000. A study on the business firms' satisfaction of university education (in Korean). p. 105.

Though not so much pervasive as in the fields of liberal arts and humanities, these kinds of "skill mismatch" problems are more acutely felt in science and engineering fields.³⁷ In quantity, Korea is not short of the students with sciences and engineering background. Combining all higher education institutions, including those providing graduate and doctorate programs, the share of students in these fields amount to 42.6 per cent in 2001 (49.9 per cent in junior college, 41.0 per cent in university, 27.6 per cent in graduate, and 41.7 per cent in doctorate programs). Indeed, Korea stands atop in OECD in terms of the share of S&E majors in higher education sector.

Table 7. Tertiary Graduates by Fields of Study (1999)

(Unit: %)

	Sciences and Engineering fields				Health and welfare	Humanities, Arts and education
	Total	Sciences	Math	Engineering		
OECD average	26.3	8.6	3.9	13.8	11.5	61.5
France	29.1	11.5	5.0	12.6	2.0	65.9
Germany	36.1	10.9	5.1	20.0	14.6	49.3
Japan	29.3	7.9	-	21.4	4.9	62.1
Korea	41.7	10.2	4.5	27.1	6.9	51.7
U.K.	27.9	9.8	5.9	12.2	12.2	59.9
U.S.	18.4	8.3	3.2	6.9	10.2	71.2

Note: 1) Here 'Sciences' category include life and physical sciences and agriculture; 'Math' includes computer sciences; 'Engineering' includes manufacturing and construction.

2) For Japan, math (& computer sciences) is included in 'sciences' category.

Source: OECD (2001)

Despite the exceptional supply-base of scientists and engineers, however, those in need in the market are not adequately provided. Hasty and mass supply of the college and graduate diplomas in Korea's so-called six strategic technology fields such as IT, BT, NT,

³⁷ The 'over-education' or 'skill mismatch' problem usually develops around the college graduates with liberal arts and humanities background, because these fields of higher education can provide an easy and low-cost access to a massive body of students who are keen on getting some college diplomas regardless of their quality.

and ST has resulted in an imbalance in the appropriate labor markets both in quality and in quantity. For instance, while there is an abundance of higher graduates with degrees in the areas of BT, those with the professional expertise required by firms are hard to find.

Table 8. Projected manpower shortage in strategic technology fields of Korea (2002-2006)
(Unit: persons, %)

	Information	Bio	Nano	Space	Environment	Culture	Total
Demand	287,227	11,356	6,074	1,214	7,927	116,100	429,898
Supply	137,064	3,361	2,856	541	7,303	70,778	221,903
shortage (%)	150,163 (52.3)	7,995 (70.5)	3,218 (53.0)	673 (55.4)	624 (7.9)	45,322 (39.0)	207,995 (48.4)

Source: Ministry of Science and Technology, Basic Plan for Science and Technology 2002-2006, 2001

Technicians and engineers are also in serious shortage in Korea's backbone industries such as electronics, automobiles, and machinery. Such group of professional manufacturing workers cannot be produced in a short period of time. Nurturing them takes a systematic and intensive investment like regular schooling at the technical high school or university level. In view of Korea's stage of industrialization now, it is likely that the present situation of shortage of technicians and engineers would persist or worsen, which implies the danger of serious undermining of Korea's long term competitiveness base.

Table 9. Employment Shares of Professionals and Advanced Technicians by Industry
(Unit: %)

Industry	US		Germany		Japan		Korea	
	1980	1994	1980	1991	1980	1996	1980	1993
Manufacturing	11.4	12.0	9.2	11.4	2.0	6.2	0.7	3.3
Transportation/Storage/ Communication	8.4	8.3	6.7	6.7	0.9	01.7	2.3	2.3
Finance/Insurance/Real Estate	10.1	10.5	18.4	18.6	1.0	1.9	5.7	12.2
Social/Individual Services	35.2	36.2	33.1	38.3	32.0	34.9	30.9	41.2

Source: ILO, *Yearbook of Labor Statistics, various years (reproduced from KDI [2002])*.

Much of the above-mentioned problems are not necessarily what Korea's higher education sector is responsible for. For instance, the skill mismatch problem results partly from the swift and massive structural adjustment of the Korean economy underway, precipitated by the 1997 financial crisis. But looking into the inner dimensions of Korea's higher education system, it would be rather surprising if Korea's higher education institutions could provide the quality students.

The quality of higher education is very hard to measure. But there is no doubt that the quality of Korean higher education is wanting a lot both for Korea's own standard and in comparison with more advanced nations. The World Competitiveness Yearbook (WCY) is

the world' most renowned and comprehensive annual report on the competitiveness of nations that analyzes how a nation' environment sustains the competitiveness of enterprises and ranks them accordingly. In the 2002 edition, the overall ranking of Korea is 27th among 49 countries and education sector competitiveness ranks 32nd. However, the degree of response to demand of competitive society of university education ranks merely 41st, 6 steps up from 2001 when Korea was 47th out of 49 countries.

Table 10. Competitiveness of Korean Education: IMD Ranking

	1997	1998	1999	2000	2001	2002
Relevance of University Education	-	-	47	43	47	41
Relevance of Educational System	32	39	44	38	44	32
Availability of Skilled Labor	21	30	40	35	25	22
Overall Competitiveness of People	22	22	31	27	-	-
National Competitiveness	30	35	38	28	28	27

Note: All numbers indicate Korea's ranking among the surveyed countries
Source: IMD, The World Competitiveness Yearbook, various issues

3-2. Problems with Regulation and Governance

The discrepancy between the supply and demand of college education largely roots from Korea's over-regulated higher education system. The nature of relations between the state and the universities has changed so much during the past several decades. Overall, the regulation on education had been tightened during the period of rapid educational expansion and economic industrialization, and the universities had long been under the tight control of government even if they were private institutions. However, as the educational demands became diversified and quality-oriented in line with the general maturing and democratization of Korean economy, it became obvious that strong regulation was taking away individual initiative and incentives that are crucial in achieving efficiency of education. As a result, the orientation of the university development headed more towards autonomy and qualitative excellence of universities.

Actually, based on the policy recommendations of PCER reform proposals, many significant policy changes were made in university governance. The universities were conferred further autonomy and provided the necessary financial support for conducting quality research. At the same time, mode of provision of higher education started to become more diversified and specialized.

Typically in the past, founding a university was subject to approval from the MOE based on the assessment of whether the university meets the strict standard criteria. New standardized criteria were set up to allow small scale universities with specialized academic programs to be institutionalized if they met the unique needs of the changing labor market. Admission quota regulation was also left to the decision of individual university. And financial support to the universities was supposed to link to the result of evaluation.

Following this approach, the incumbent government now has developed a kind of indirect incentive approach to make universities change their structure and operation

rather than the direct control and regulation practices as in the past. The government has imposed this indirect control approach through guidelines for restructuring university academic programs, management system, BK21 project, and other financial support programs and evaluations.

However, as C. Lee (2000) argues, the current relation between the state and the universities in Korea is the kind of administratively guided autonomy and administrative accountability system. The deregulation efforts made over the past decade have not gone far enough or have not rooted down yet. Korean higher education system is far more heavily regulated by the state when compared to western countries, and remains highly centralized and inflexible to market needs. To wit, both the private and public universities lack autonomy in their management and academic affairs, with government regulations constraining them in the recruitment and payment of staffs, student admissions and enrollments, fee levels, and so on. Although the universities do not receive direct government instructions on curriculum content, the curricula that they actually provide are fairly uniform and many universities simply copy the programs of the top-ranking universities. All Korean universities operate in a "department store" style, all offering similar disciplines rather than concentrating on selected areas in which they have a competitive advantage. Consequently, the students coming out of this system tend to have the same knowledge structure and skills.³⁸ Consequently, the heavily regulated system does not have the flexibility to fulfil the country's growing demand for new types of knowledge workers.

The stubborn legacy of over-regulation is most notable in college admission system. Until very recently, the university entrance examination system was open to the criticism of making the entire education system exam-driven, being both inequitable and inefficient as a means of selecting students. Examinations rank students according to their total scores in a limited range of subjects, pointing to a lack of diversity; and the adoption of multiple choice questions does not encourage critical thinking or analysis. It is inequitable because it stimulates a high level of spending on tutoring in preparation for the entrance examination, putting significant financial pressure on lower income families.³⁹ In 1998, the government abolished the high school entrance examination, introduced a performance-based evaluation system, and reformed the college entrance system by allowing universities to develop their own admission criteria and select students based on performance rather than on pure test scores. However, this has not yet resulted in substantial changes in the system due to the lack of institutional capacity of the universities to implement such wide-ranging reforms.

Although the government control is strong for all types of universities in Korea, it is especially severe for national universities. Currently in Korea, there are 44 national universities altogether, including 11 teachers colleges and 8 industrial universities.²⁴ Their financial dependence on the MOE is no greater than 50 per cent of their total budget, but all

38) Woo and Lee (1999). The PCER reform proposals include increasing institutional autonomy, and implementation has already started, for example, in the regulation of student admissions to universities, but reforms have not gone far enough.

39) Parents spend large amounts on private tutoring, some to make up for poor quality schooling, and to provide greater diversity. More than 53% of Korean households with school-age children pay for private tutoring for their children (KEDI survey). More than 50% of students receive tutoring from the for-profit Private Learning Institutes (PLI) or Hak-Won. Total expenditures on private tutoring amounted to 3.2% of GDP in 1998. There are two kinds of PT: one for improving talents and the other for academic achievement. Typically, pre-school children and elementary school students engage in private tutoring for the purpose of acquiring specific talents, such as , learning drawing or music, and for improving the 3Rs. This may be called PT1. This type of tuition is demanded because Kindergarten or primary schools do not meet parents' expectations of quality and variety in education. Secondary school students, on the other hand, focus on academic achievement in such subjects as English, Korean and Math in order to improve their chances for college entrance. Expenditure on PT2, therefore, does not so much compensate for poor school quality but is geared largely towards the college-entrance exam, which is highly competitive because of the limited university entrance quota.

the high-rank administrative staffs are from the MOE offices. Also, their financial operation is very constrained and inflexible to the budget law and regulations. Despite their heavy dependence upon the MOE, their presidents are selected by the election of their own faculty members. In addition, each national institution has a separate special account, namely *Kisonghoegae*, for its own expenditure, which is financed by the students' fee.

In order to secure necessary financial and administrative resources, all the national institutions were integrated equally under the MOE almost as extensions of its administrative organization. While each individual university commands ultimate authority in governance decision-making, the MOE maintains strong links to each institution with respect to administration and finance. The contradiction between the two elements still characterizes the governance and finance in national institutions at the present time.

The system of governance and finance has attracted serious criticisms from inside as well as from outside of the national institutions (Research Institute for Government Reform, 2000). The complaints from inside focus mainly upon the inflexibility in budgets and administration. Given the principle of university autonomy, budget allocated to a national university is typically divided among universities based on the numbers of faculty and students. As a result, available budgets for each university has become too fragmented to attempt innovative educational experiments or research activities. Moreover, expenditure of the budget is subject to the governmental auditing, and thus has to comply with the accounting codes of the national government. These codes and regulations tend to be too restrictive to attempt innovation in research or education. These complaints have been particularly strong among the leading research institutions.

Criticisms from the outside have been made from various viewpoints and some of them concern fiscal efficiency and inequity. Most frequently it was alleged that the national institutions were inefficient, and slow in responding to changes in social demands, due to a lack of sufficient administrative authority at the institutional level and the bureaucratic red tapes. Another important criticisms was concerned with the almost exclusive dependence of the national institutions upon the national budget. Another criticism came from soft constrained financial support to the institution based on the status of national university without considering the economic difficulties of applicants. It creates the problem of inequity for the benefit of higher education determined only by the providers' status.⁴⁰

3-3. Problems with Financing

Korea invests a vast amount of resources on education. According to OECD (2001), the ratio of educational expenditure to GDP of Korea in 1998 was 7 per cent, which was 1.3 per cent higher than the OECD average. Expenditure on higher education is much smaller than expenditure on primary and secondary education. Nonetheless, the expenditure for higher education itself is quite immense. Indeed, in terms of the GNP share, Korea spends the greatest portion of national income on higher education among the OECD countries: Korea spends 2.51 per cent of GNP in higher education, which is almost twice as much as the OECD mean of 1.33 per cent. It is also even greater than the U.S. figure, which is 2.29 per cent.

40) In legal and regulatory perspective, the private universities have appropriate autonomy to its operation. Even though they have appropriate autonomy uniformly, we have to admit that there is very broad range of diversification of the quality of governance and transparency, and it would explain the actual operations of the individual university.

Table 11. Trend and Structure of Education Financing in Korea

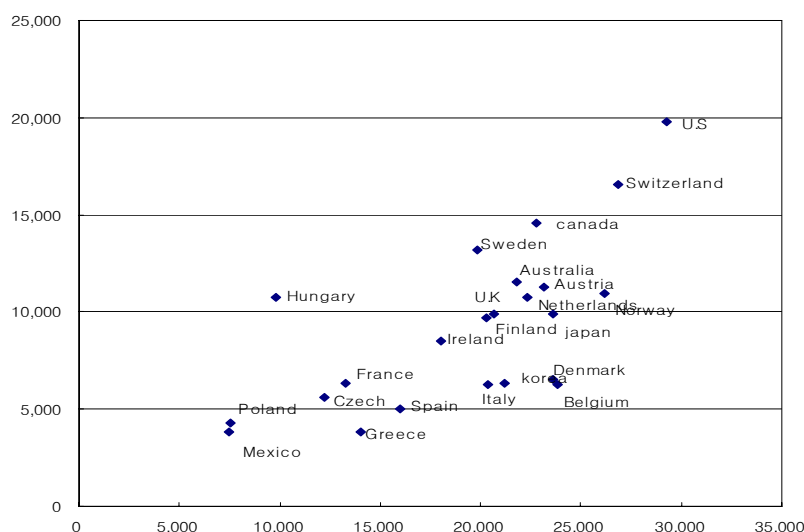
Type of education	Level of education	Finance Method	Korea						OECD Avg.	USA
			1977	1985	1990	1994	1998	1998*	1998	1998
Public	All levels		4.60	5.73	4.86	5.14	6.84	7.03	5.66	6.43
		Public	2.44	3.13	2.97	3.29	4.32	4.07	5.00	4.82
		Private	2.16	2.60	1.89	1.85	2.52	2.96	0.66	1.61
	Primary & secondary		3.82	3.98	3.44	3.47	4.21	3.95	3.71	3.74
		Public	2.22	2.59	2.47	2.73	3.37	3.15	3.47	3.40
		Private	1.60	1.39	0.97	0.74	0.84	0.80	0.35	0.35
	Tertiary		0.78	1.68	1.33	1.55	2.48	2.51	1.33	2.29
		Public	0.22	0.52	0.48	0.53	0.90	0.44	1.06	1.07
		Private	0.56	1.16	0.85	1.02	1.58	2.07	0.29	1.22
Private			0.70	0.90	1.20	1.80	2.90			

Source: Reproduced from Lee & Woo (2001) (All data for Korea except those in the column marked * are from 'Statistical Yearbook of Education' [various issues]. The rest of data are from OECD [2001]).⁴¹

The large volume of spending on higher education, however, does not necessarily mean that Korea spends enough on higher education. First and foremost, the huge total amount of spending simply reflects that Korea has one of the most extensive tertiary education sectors in the world.⁴² Indeed, a simple international comparison shows that Korea spends less per student than most other OECD countries. As the figure below shows, even when taking into account the difference in income level, Korea belongs to a group of countries that spend relatively less for each college student for their incomes.

41) Since the definition of education in OECD (2001a) is more broad, the ratio in OECD(2001a) is higher than that in Statistical Yearbook of Education of Korea(1998).

42) Besides the students size, the total expenditure is affected by many variables including: drop-out rate, distribution of enrolments across sectors and fields of study, the scale and organization of linked research activity. Of course, a statistical problem for measuring private expenditures can not be ruled out (OECD 1998).

Figure 1. Per capita GDP (PPP) and per student expenditure on higher education

Source: reproduced from J.Kim (2002).

Higher education is the most resources-intensive sector of education, and thus takes a long period of stable and substantive investment to build up.⁴³ Not only current investment but also the stock of all past investment would matter. Arguably, Korea may be spending enough for its higher education now, but just looking at the current state could be quite misleading. It is not until the late 1990s that the spending on higher education rose to a level fitting its colossal quantitative profile. During the 1980s, the GDP share of expenditure on higher education had remained stagnant: In fact, comparing the expenditure shares of 1994 and 1985, we see that Korea spent less in 1994 (1.55 per cent) than in 1985 (1.68 per cent). Noting that Korea's higher education sector markedly expanded during this period,⁴⁴ it is clear that the heroic expansion of Korean higher education has not been accompanied by appropriate increase in funding.

The trend in per student expenditures helps confirm this observation. The table below shows that per student expenditure in higher education has not increased that much since 1975, especially in comparison to those in the lower levels of education. For instance, per student expenditure has increased more than seven times in elementary school from 1975 to 1999, but less than two times in higher education. It is noteworthy that during the first half of the 1980s, the absolute amount of per student expenditure actually fell for all three types of higher education (regular universities, teachers colleges, and junior colleges) and that such trend continued in the second half of the 1980s for junior colleges. Taking account of Korea's high and continued economic growth throughout the period, such a modest spending increase for college students leads us to speculate that the per student spending relative to per capita income might have fallen over time. The table below confirms that this

43) Taking the per student expenditure, for instance, OECD countries spend on average 2.4 times more at the tertiary level than at the primary level, and about 1.7 times more than at the secondary level. However, the relative sizes of the differences vary markedly across countries. For instance, whereas Italy only spends 1.1 times as much on a tertiary student as on a primary student, Mexico spends 4.4 times as much. (see OECD[2001]).

44) From 1985 to 1995, the enrolment increased about 60% from 1.45 million to 2.34 million, and the total number of higher education institutes increased from 463 to 754 (see Table xx).

is exactly what has happened in Korea. For all three types of higher education, per student expenditure relative to per capita income had fallen quite steeply until 1990, so that, despite a mild recovery underway after 1990, the 1999 level remains at about one half of the 1975 level. The per student expenditure on higher education, relative to national income and the lower levels of education, may be interpreted as an indicator of the relative emphasis placed on higher education, as well as the relative costs of acquiring higher education (OECD [2001]). In this sense, the long-term trend in Korea under discussion indicates that, although the higher education has become less costly and more affordable, the relative emphasis placed on higher education by Korea's overall education policy has dwindled continuously.

Table 12. Per Pupil Public Expenditure by level of education

	Primary School	Middle School	High School	Technical College	Teachers College	University
Per Student Expenditure (in constant thousand 1995 Won)						
1975	214	324	590	1,758	3,567	2,523
1980	360	478	455	2,152	3,386	3,150
1985	657	618	820	1,764	3,221	2,494
1990	834	1,030	1,159	1,583	4,441	2,806
1995	1,412	1,380	1,785	2,538	4,226	4,227
1999	1,585	2,079	1,950	3,562*	5,409	4,602
Ratio to per capita GDP (%)						
1975	9.2	13.9	25.3	75.4	153.0	108.2
1980	11.9	15.8	15.1	71.4	112.3	104.4
1985	16.0	15.1	20.0	43.0	78.5	60.8
1990	13.6	16.8	18.9	25.8	72.3	45.7
1995	16.9	16.5	21.3	30.3	50.5	50.5
1999	16.9	22.1	20.8	37.9*	57.6	49.0

Note: * for the year 1998

Source: Ministry of Education, Statistical Yearbook of Education, various issues

The low-cost, under-funded nature of Korea's higher education can be most cuttingly captured by the trend in student-faculty ratio. An over-crowded, under-staffed classroom environment used to be one of the most notorious characteristics of Korean education system, commonly seen in primary, secondary and higher education. However, the situation has improved steadily and greatly at pre-college level since 1980. Although there still remains a considerable gap as against the OECD standard, the gap has been substantially reduced. In contrast, the situation has not improved that much at the higher education level, and if any, has worsened when compared to three decades ago. As concerning universities, student-faculty ratio in 1995 stays as high as about 26 to one, almost the same as in 1980. Turning to junior colleges, the situation is simply baffling. The

student-faculty ratio has increased explosively from 20.5 to one in 1970 to 30.1 to one in 1980 and to 55 to one in 1995. Certainly, having a more favorable teacher-pupil ratio will not, by itself, improve the quality of learning, but with a student-faculty ratio staying as high as it does in Korea now, teaching would necessarily have to be desk-bound and teacher-centered. Simply speaking, the schooling environment of Korean higher education on average has become shamefully poor, with not enough of investment made in pace with explosive increase in student body.

Table 13. Trend change in Pupil-Teacher ratios and Comparison with OECD (Unit: %)

Year	Elementary	Middle	High	Junior Colleges	University
1970	56.9	45.3	29.7	20.5	18.8
1975	51.8	43.2	31.4	22.9	20.7
1980	47.5	45.1	33.3	30.1	27.9
1985	38.3	40.0	31.0	37.8	35.8
1990	35.6	25.4	24.6	31.2	31.5
1995	28.2	24.8	21.8	54.9	26.3
2000	28.7	20.1	19.9	78.0*	39.7*
OECD	18.0	15.2	14.1	15.3.	
Japan	21.2	17.1	14.1	11.5	
Germany	21.0	16.4	12.4	12.3	
US	16.3	16.8	14.5	14.0	
UK	22.5	17.4	12.4	18.5	

Note: 1) For junior colleges and university, faculty of teaching assistant rank is included for all years except 2000.

2) The reference year for OECD numbers is 1999.

Source: Ministry of Education, Statistical Yearbook of Education, various years; and OECD (2001)

Expansion of Korea's higher education has been a seriously under-funded process that took place to the detriment of the average quality. Virtually all higher education institutions in Korea have suffered from lack of resources. This problem has much to do with the unique financing structure of Korea's higher education. In Korea, government financial support for tertiary education has been very small, and private expenditure, mainly tuition, has been the main financing source of tertiary education. Until recently, most of educational budget has been allocated to primary and secondary education, with less than 10 per cent disbursed to higher education and the share of private contribution has typically stayed as high as two thirds of total higher education financing.

Table 14. Trends of Government expenditure for higher education

(Unit: billion Won in 1995 constant terms, %)

	'65	'70	'75	'80	'85	'90	'94	'96	'98	'01
MoE budget	15	78	227	1099	2492	5062	10879	15565	17485	20019
Budget for Univ.	1	4	12	99	179	362	734	798	2319	2634
Univ. share (%)	10.2	5.7	5.6	9.0	7.3	7.2	6.7	5.1	13.3	12.2

Source: Ministry of Education, Statistical Yearbook of Education, various years (data for the years until 1996 are from OECD [1999])

A simple international comparison shows that Korea is a pronounced outlier in respect of the structure of higher education financing. As of 1998, the private share of higher education expenditure stood as high as 83 per cent in Korea. The normal OECD range is below 40 per cent, and even for the US and Japan – two countries with the most extensive private-financed tertiary education sectors in the world – the figures do not exceed 60 per cent.

The unique financing structure of Korea's higher education reflects the predominant position of private institutions. As mentioned before, private institutions have assumed a pivotal role in the expansion of Korea's higher education throughout the times. As late as back in early 1970s, about 80 per cent of all higher education institutions were private, enrolling about the same percentage of students there. The figures have not changed much over time. As of 2002, about 83 per cent of higher education institutions were private, and they took up about three fourths of students and faculties.

Table 15. Private institutions in Korean higher education (2002)

		Regular Univ.	Junior Colleges	Others ¹⁾	Total
No of Institutions	total	163	159	36	358
	private	137	143	16	296
	(% share)	(84.0)	(90.0)	(44.4)	(82.7)
No of Students (thousands)	total	1,772	963	579	3314
	private	1,384	924	127	2435
	(% share)	(78.1)	(96.0)	(21.9)	(73.5)
No of full-time faculties	total	44,117	12,156	3477	59,750
	private	32,545	11,439	2009	45,993
	(% share)	(73.8)	(94.1)	(57.8)	(77.0)

Note: 1) others include teachers colleges, industrial Univ., technical college, and the miscellaneous.

Source: Annex Table A2

It is often argued that the private higher education is basically a private good and may well be financed on a private basis.⁴⁵ In Korea, this argument has been upheld almost as a dictum throughout the times. Despite their huge market share, government support for private institutions, including scholarships and loans provided to students and direct subsidies to the institutions, has been negligible. As a result, the private institutions were left to draw on private resources only, mostly on tuition. During the past several decades, more than 90 per cent of funding for most private universities came from student tuition. The situation has changed a little lately, but private universities still remain heavily dependent on tuition for their revenue (about 67 per cent of revenue), while getting less than 5 per cent of their revenue from the government.

Table 16. Sources of Finance for Universities and Colleges

	Korea(1999)		USA(1995)		United Kingdom (1999)
	Public University	Private University	Public University	Private University	
Government funds	57.5	4.8	51.0	16.4	53.3
Education	-		37.6	0.6	48.5
Research	-		13.4	15.9	4.7
Tuition fees	42.5	66.8	18.8	43	11.9
Private gifts, grants, and contracts	-	9.0	4.1	9.1	10.7
Endowment income	-	11.2	0.6	5.2	
Sales and services	-	2.1	22.2	21.0	17.0
Other sources	-	6.1	3.3	5.3	7.0

Source: reproduced from Young Lee (2002)

The financial plight of Korea's private tertiary institutions is exacerbated by the fact that most of them do not generate substantial revenues from private donations, endowments of their own, or any other form of university-affiliated businesses. This contrasts starkly with the US, another country in which private universities play comparably important roles as in Korea. As shown in the table above, the US government's research support to private higher education institutions is substantial (15.9 per cent of revenue). In addition, private institutions themselves generate substantial size of revenue on their own through affiliated enterprises and hospitals.⁴⁶ The shortfall of private endowment and donations in Korea is

⁴⁵ The primary and secondary education are usually perceived as a public good and are therefore publicly funded. At the tertiary level, however, the high private returns in the form of better employment and income opportunities suggest that a greater contribution by individuals to the costs of tertiary education would be justified. Hence the proportion of private funds tends to be much higher at the tertiary level, ranging from 2 % in Austria and Switzerland to over one third in Australia, Canada, Japan, and the US. (OECD[2001])

⁴⁶ Also, it differs greatly from the Japanese situation in which the government decided to subsidize substantial amount to private universities. The differences between the US and the UK (shown in the table) also are noteworthy. In the United States, public finance of colleges/universities' heavily depend on government support, around half of the finance is accounted for by government grants. Private colleges/universities in the US also receive considerable financial support from the government. Note, however, that virtually all the financial support

due to several reasons. First and foremost, the history of private universities is relatively short. Although several universities were established in the nineteenth century, their meaningful operation started only after 1950. Therefore, there has not been enough time for these universities to accumulate substantial endowment. Second, given the excessive demand for college diplomas, there has been no compelling need or pressure for private institutions to exert serious efforts to build up internal resources to provide quality education. The table below shows that the portion of capital expenditure in Korea's higher education institutions is higher than any other OECD countries. Such outlay structure, on one hand, vindicates that most Korean higher institutions are short in history and are still in the stage of expansion and institution building. It also indicates that the level of tuition, though controlled tightly by the government, is high enough at least to cover the extra costs incurred by extra students admitted, including the extra capital costs to install new buildings and equipment. Essentially, given a reservoir of the college hopefuls who seek for some diplomas regardless of their quality, many private universities could stay in the market safely and continue the tuition-based size expansion, without being exposed to much of market pressure to secure their own internal revenues sources.⁴⁷

Table 17. Educational expenditure by outlay category

	Total Expenditure		Current Expenditure			
	Current	Capital	Teacher	Staff	Teacher + staff	Other current
Korea	68	32	38	15	53	47
OECD Average	87	13	46	25	70	30

Source: OECD, Education at a Glance, 2001

Lack of resource has been a serious problem in national universities as well. In the past, the Korean government funding for higher education was almost exclusively directed to national universities, which were established to provide quality education for a small selected group of quality students. With the adequate financial support from the government, most national universities could manage to retain their status as the leading higher institutions at least as late as the 1980s.⁴⁸ However, the situation started to change in 19890 as Korea switched to the policy of massive accommodation of college demand. As the quantity expansion of national universities went on without a commensurate increase in government budgetary support, the government support had become insufficient, and they had to draw on tuition fees heavily. In 1999, the revenue share of tuition of national universities on average stood at 42.5 per cent. Though lower than their private counterparts in Korea, this figure is by far higher than that in the U.S. (18.8 per cent). Indeed, in respect

for private schools is in the form of research grants, not general grants. Unlike the US, the UK government provides a general subsidy to universities using a formula based on the number of students, subject-related factors, student-related factors, and institution-related factors. Both in the US and the UK, colleges/universities finance around 20% of their income from affiliated enterprises and hospitals.

⁴⁷) With their reputation risk at the minimum, most private institutions were intent on securing as many students as possible. This means that the tuition level was high enough to more than cover the marginal cost of admitting extra student.

⁴⁸) This fact can be inferred by looking as the per student expenditure trend shown in table xx . Note that back in 1975, the per student expenditure for teachers college – all national in Korea - was about 1.5 times higher than general-purpose universities, and twice higher than the junior colleges.

of their tuition dependency, national universities are not that much different from private institutions. Also, as the level of tuition and the personnel decisions are regulated by the government, an individual public university has to finance a substantial portion of its operating budget from the government apportionment. These days, the situation is getting worse for most national universities. The overall financial conditions of national universities and their overall schooling environment used to be better than those of private institutions, but not any longer. With tuition tightly controlled by the government, it is natural that their financial conditions are rendered to deteriorate fast. For now, this trend continues, and the per-student expenditure of national universities keeps falling below the corresponding levels of private institutions.

Table 18. National Universities vs. Private Universities: Recent Trend

(Unit: thousand persons, thousand Won)

Year		1997	1998	1999	2000
National	Students Size	289	297	308	324
	Per Student Expenditure	5795	5747	5505	5334
Private	Students Size	912	980	1027	1083
	Per Student Expenditure	5996	5992	6116	6000

Source: reproduced from J. Kim (2002)

Financing policy towards higher education involves several issues other than simple resource mobilization. It is not only the absolute size of public funds but also the mode and forms of their delivery, final incidences, and administration that matter. In this regard, there are some notable trends developing in Korea since the mid 1990s. First, while the total amount of governmental support for higher education is on the rise, an increasing portion comes from various ministries other than the Ministry of Education. Although a more systematic and thorough counting is yet to be developed, it is estimated that, in 2000, the Korean government as a whole invested about 3.3 trillion won on higher education, about 27 per cent of which came from ministries other than the Ministry of Education (Lee and Woo [2001]). Second, an increasing portion of the public resources is used to support research function of universities and allocated by performance based on merit-based selection criteria. It is estimated that the research-related support took up about half of the total public budgets disbursed to Korean higher education in 2000.

Table 19. Financial Support to Tertiary Education from the Central Government, Korea and US
(Units: 100 million Won, %)

	Korea(2000)			USA(2000)	
	Amount	Share		Amount	Share
Total	31,558	100%	Total	40,903	100%
M of Education & HRD	23,595	73%	Department of Education	16,524	40%
Operating costs for public U research & related expense	12,747 10,848	36% 31%	Student financial assistance Family Education Loan Program	9,363 4,031	23% 10%
M of Science & Technology	3,030	9%	Department of Health and Human Services	10,210	25%
Operating costs for public U research & related expense	885 2,145	3% 6%	Department of Energy	3,945	10%
M of Commerce, Industry & Energy	1,855	6%	NSF	2,896	7%
Operating costs for public U research & related expense	30 1,825	0% 5%	Department of Defense	2,615	6%
M of Labor	1,096	3%	NASA	2,163	5%
Operating costs for public U research & related expense	1,066 30	3% 0%	Department of Veterans Affairs	1,143	3%
Other agencies	1,982	6%	Department of Agriculture	505	1%
			Other agencies	902	2%

Source: 1) Ministry of Planning and Budget, Budget, various issues.

2) US Dept. of Education, Federal Support for Education Fiscal Years 1980 To 2000.

The growing weight of research-related funding is a desirable, and actually much over-due, change for Korea, given that Korea has already reached the stage of economic development in which research function of higher education is as vital as its teaching function. In this context, the involvement in university financing of various ministries undertaking national R&D programs can be considered as a progress.⁴⁹ Indeed, the involvement of a number of ministries in financing tertiary education can also be observed in the United States. However, close scrutiny reveals several distinctions between the US and Korea. First, in Korea, all involved ministries provide similar funding services including subsidization of operating costs.⁵⁰ The US system is more systematic with a branch of each agency committed to clear purpose. Second, whereas the Ministry of Education of Korea provides research grants and related expenses to public and private

⁴⁹) This research grants and related expenses include not only research grants but also subsidies for facilities and equipment. We are forced to use this combined item since many government programs have research grant element and subsidies for facilities and equipment at the same time.

⁵⁰) In Korea, all ministries listed in the table have some colleges/universities under their direct supervision (e.g. KAIST under Ministry of Science and Technology) and provide considerable amount of financing to them.

institutions, the Ministry of Education of the US engages exclusively in providing scholarships and student loans.⁵¹ Third, regardless of funding source within the government, most recipients of research grants in the US are individual researchers, while the government of Korea provides research grants at the university or research institute level.

These observations allude that Korean system of financing higher education may have some structural problems apart from the mere shortage of the public resources. First, although a diversified, multi-ministerial financing system may have some merits, considerable inefficiency may occur due to a lack of coordination across ministries. Second, the exact mode and composition of public support for higher education vary substantially across countries. However, in view of common practices of the OECD countries, it is clear that too much of the funds in Korea are directed to institutions, with a very limited portion going directly to students or researchers as financial aid and research scholarship.⁵² As the table below shows, financial aid to students takes up only 3 per cent of public budgets for higher education, and even these limited amounts are delivered through institutions. Because the institution-directed funding stands against the greater choice of individual constituents of higher education system, thereby causing the supplier-oriented, bureaucratic operation of universities, the present funding mode of Korea needs to be re-modeled to give a greater portion of financial support to individuals.

Table 20. Public Subsidies for Private Sector for Higher Education: Institutions vs. Individuals

	Direct support for Institutions	Transfers for education to private entities						Transfers as percentage of GDP
		Financial aid to students				Other private entities	Total	
		Scholarship, other grants	Loans	Total	(attributable for institutions)			
Korea	96	3	N/A	3	(3)	1	4	0.02
OECD	82	12	5	17	(4)	1	18	0.27
U.S.	80	11	9	20			20	0.27

Source: OECD (2001a).

51) The Ministry of Education in the US delegated research finance to an independent, specialized agency, that is, the National Science Foundation.

52) OECD countries spend an average of 7.1 per cent of their education budgets on subsidies to households and other private entities, with most of these amounts devoted to the tertiary level of education. OECD countries spend, on average, 18 per cent of their public budgets for higher education on subsidies to households and other private entities. Only Greece, Korea, Switzerland and Turkey spend less than 5 per cent of their total public spending on tertiary education on subsidies (OECD 2001, p 103).

CHAPTER 4

Potential and Prospect to Make Transformation

4-1 Favorable market and policy factors peculiar to Korea

The demands of a knowledge-based economy have placed special emphasis on the ability of a nation's workforce to bring about industrial and organizational innovations, which are the cornerstone of maintaining competitiveness. In this regard, Korea's higher education system is not performing well enough against the expectations of the Korean society. However, the problem is not unique to Korea and several industrializing and industrial countries that face similar challenges share similar concerns. In essence, the new knowledge-based economy requires a different type of organization of production, which in turn calls for changes in the relationship of worker to work, worker to worker, and worker to consumer, and seeks to stimulate continuous improvements in workers. To maintain relevance, education and training institutions need to become more market-orientated, i.e. meeting the needs of employers and students alike. However, whereas the workplace has undergone exponential change, education systems are undergoing only incremental changes. Actually, in response to momentous and convergent trend change in the environment, a number of countries have undertaken significant transformation of their education systems, including changes in financing and governance, cultivation of institutional differentiation, creation of evaluation and accreditation mechanism, and curriculum reforms. But progress has been uneven and sharp contrast remains across and within the education system worldwide. Most countries continue to wrestle with some difficulties of their own, such as those arising from inadequate responses to pre-existing challenges. In fact, even in the US, a country widely considered to be equipped with the most dynamic, resilient, and competitive higher education sector of the world today, there is growing recognition that the skills necessary in the current workplace are drastically different from those taught in schools and colleges.

The more urgent the task of upgrading the quality of its higher education becomes, the more Korea needs to take an objective and balanced view about itself. Despite the stock of grave problems it faces, Korea has the great potential to emerge as a leading knowledge-based economy of the 21st century, drawing on the assets accumulated in its tertiary education sector. The overall environment is also ripe for Korea to realize its potential. The potential and environmental factors may be identified as the following four characteristics.

A. Completion of Quantity Expansion

With quantitative expansion of higher education almost completed, Korea is able to focus on "quality-reform". Massive participation in higher education is a global trend that persisted over the past few decades. Though varying in degree and context, an increasing number of countries around the world are exerting greater efforts to build up or further expand their tertiary education sector. Many European nations including France and the U.K. are departing from their long-upheld approach of "elite college education" towards

the alternative policy of expanded opportunities for the larger segment of population.⁵³ Enrolments keep growing even in the U.S. and Japan, which already have the most extensive, mass-based tertiary education sectors in the world.⁵⁴ In the face of the widening gap in this global mass-education race, developing nations are stepping up efforts to expand their tertiary education, but with varying degree of success. Setting aside its desirability or eventual outcome, a common observation is that the policy goal of developing mass-based tertiary education can not be easily attained, especially due to difficulties in mobilizing extra financial resources needed.

As mentioned earlier, the massification process of higher education is almost completed in Korea, and the policy burden of “expanding educational opportunities or accommodating social demands for higher education” is almost overcome. By many accounts, Korea may well be in the position to attempt an all-out “quality reform” that focuses on the excellence and diversity of higher education.⁵⁵

Table 21. Change in Tertiary Enrolment Rate (1995-1999)

Korea	U.K.	Germany	France	Italy	Denmark	Ireland
150	119	107	105	110	120	110

Note: 1995 level = 100,

Source: OECD, *Education at a Glance*, 2001

Certainly, it might have been the best if Korea attained the quantity expansion and quality upgrading at the same time. But, in reality, the trade-off between these two goals is inevitable, especially when the quantity expansion occurs so rapidly and so pervasively, as in the case of Korea. The priority between quantity and quality is not clear either. Both theoretically and empirically, there is no a priori ground to believe that a policy of pursuing quality at the cost of quantity is superior to the policy of pursuing quantity at the cost of quality. Korea’s own experience of building up primary and secondary education is a case in point. As is well known, the Korean model in this regard is widely acclaimed as a textbook success story. By many accounts, the highly touted Korean model may well be characterized as a model of putting greater emphasis on quantity rather than quality.

The pervasiveness of higher education in Korea may be somewhat excessive for its development stage, but it may be interpreted as a sort of “reservoir investment” made ahead of time. Though arguable, quality reform would be easier to pursue when there is an excess-supply of higher education market than otherwise. In Korea, generic college diplomas have already come to fetch less value in the market, and virtually all higher

53) Taking the case of the U.K for instance, thirty years ago, while only about 5 % of the population went to university, a third of young people going into higher education today. It is reported that the U.K. government aims to increase this to a half (Terri Kim (2003).

54) Enrolment rate in the US increased from 55 % in 1980 to 81 per cent in 1995. The enrolment rate of OECD countries on average more than doubled during 1970 to 1997 from about 25 per cent to 50 per cent (the World Bank[2001]).

55) Though different in context, Korea has also some advantage over other countries in respect of secondary education reform. A big challenge confronting most advanced nations in the area of education is pulling up of students academic performance such as comprehension and mathematical ability. As is well known, the academic achievements of Korea’s secondary school students are world-class. Certainly, there exists a downside to such achievements, which is the loss of creativity and self-motivated learning. However this also indicates that, unlike advanced nations, Korea is in a unique position to concentrate exclusive on the “quality reform” in respect of secondary education.

education institutions are under severe pressure to 'innovate' and 'differentiate' themselves, whether it is to stay alive or to stay ahead in the market. Although it is limited in scope and contents, innovations have started to take place in almost every academic program of most institutions. Indeed, when well managed and steered by appropriate policy measures, virtually universalized higher education of Korea could turn into a great asset rather than a burden for future Korea.

B. Reservoir of Investment Resources

Since the sub-standard quality of Korean higher education is caused by lack of resources, upgrading Korea's higher education sector will take huge amount of extra resources. There are two factors that could favorably affect Korea's endeavor in this vein. First, the demand for the public resources for basic education could possibly diminish, and the government could have relatively more resources available to higher education. As emphasized before, higher education has consistently been out-prioritized by basic education in respect of the allocation of public resources. There is a high chance that this bias will be mitigated or rectified in the near future. As mentioned before, the overall schooling environments of Korea's primary and secondary education has improved steadily over time. Thanks to the latest policy and funding drive in this direction, Korea is on the verge of attaining its first stage goal of reducing the class size close to the level of Japan. Furthermore, throughout the last decade, school-age population had decreased in Korea, and this tendency is likely to continue. The number of pupils from 5 and 14 years of age will not be expected to increase for coming ten years, whereas the number of pupils from 14 and 19 years of age is likely to decrease by 10 per cent. This implies that, without a further increase in the current level of budget support to basic education, it is possible to increase per-pupil expenditure and to improve schooling conditions therein along a long-term trend line. In essence, Korea can now afford to direct greater portion of public resources to higher education without incurring serious costs on basic education sector.

Secondly, extraordinary zeal for education and huge investment potential of the private sector make an unusual asset Korea can turn to. Keen interest and passion for education demonstrated by the members of society is the basis and prerequisite for an educational revolution steered by the private sector and the self-motivated learning revolution. For now, Korea's education fever is tilted too much towards regular education, thereby creating serious adverse effects such as fierce college entry competition and excessive private tutoring. Regrettably, an enormous amount of money, estimated to be around 3 per cent of the GDP, is being used for private tutoring in an unproductive way. But the presence of such huge sum of tutoring expenses itself means that the staggering amount of resources needed to improve the quality of higher education already exists in Korea. Of course, the questions of how much of those resources can actually be injected into higher education and what policy initiatives are needed remain to be answered. One feasible option, though highly controversial in Korea, is to absorb those tutoring resources in the form of tuition for the private high schools running solely on private resources, and to re-funnel thus saved government budget to increase support for higher education.

For all the practical issues involved, the above two factors - diminishing government burden of supporting basic education, and the reservoirs of huge private resources - indicate that Korea has the potential to bear additional investment costs necessary for higher education reforms without increasing the financial burden on the government or private sectors by much. In this regard, Korea is in a more advantageous position compared with other advanced nations, where fiscal dependency of education investment

on government remains quite high and investment resources have already reached their limits.

C. Progressive Changes in Labor Market Condition and Social/Cultural Environment

Upgrading of Korean higher education requires all-dimensional and full-fledged innovation competition among institutions, geared for greater diversity and higher quality. Korea's labor market conditions and underlying social and cultural environment have long been the factors hampering Korea's progress in this regard. It was frequently pointed out, and sometimes truthfully, that people have been ranked by their education level, academic cliques, and seniority. Under such environment, once formal schooling is over at certain institution, no individual effort to further improve oneself is likely to yield any visible result. Employment and quality of life after graduation is not determined fairly by one's abilities, but largely influenced by level of education and membership in academic society. Such social atmosphere gave rise to single-minded competition for acceptance into academic societies, which typically develop around a handful of elite universities. In fact, Korea's higher education market is highly stratified with all institutions ranked along a long spectrum of quality or reputation hierarchy.⁵⁶ The problem is not the hierarchy itself, but its rigid structure: the market has long been dominated by a small, fixed pool of elite institutions whose overall reputations and ranks have been unchallenged for a long period of time.⁵⁷ The rigid hierarchical market structure has long been a significant factor that undermines incentive of individual institution to set about serious efforts to innovate and to move ahead of others.

However, amid Korea's economy-wide restructuring process since the latest financial crisis, the labor market is becoming more and more flexible with progressive changes appearing in overall social atmosphere.⁵⁸ As competition pressures on Korean firms mounted up sharply, new recruitment and personnel practices that attach more importance

56) Hierarchical structure of Korean higher education market has been recognized for long time. Although there is no official or generally accepted university ranking among public, recently there has been more systematic efforts to rank institutions and programs. First, since the 1995 education reform the government started to evaluate and rank universities in implementing various performance- or merit-based subsidy programs. Second, Korean Council of University Education(KCUE), a non-governmental organization founded in 1982 as an intermediating body between the government and four year universities, is reinforcing its evaluation function in connection with its own 'quality-assurance' and 'accreditation' mission. Third, private organizations, such as mass media, started to rank universities. For example, Joongang Daily Newspaper ranks all major universities every year, following a methodology similar to the US News & World Report's ranking for American University. Forth, 'Jinhaksa', a major private information company that specializes guidance for college admissions, keeps detailed scores for Scholastic Ability Test (SAT) for different programs in all universities.

57) Despite the deep and widespread concern over the hierarchical market structure dominated by a few elite universities, very limited efforts have been made yet to look into this problem in rigor. The degree and structure of the dominance of top-rank institutions can be inferred from the recent study by Jang (2002). Estimating the spread of wage premium of top thirty universities as against those ranked below, Jang showed that while the graduates of top five universities command the pronounced wage premium of about 42 per cent, the premium declines very quickly below that level, with for instance the next top five universities commanding less than 10% of premium. Using different data set, Kim and Lee (2002) confirms that Korean higher education market is set up highly hierarchically so that the top rank universities, consisting mostly of private universities in Seoul metropolitan area, attracts not only top students but also private donations money. Of course, university hierarchy and its associated problems are not unique in Korea. As Kim and Lee(2002) states, when the free selection of students by universities is permitted, it is natural for a system of hierarchy or ranking among universities to emerge and for the high rank institution to command some market premium associated with their reputation. The US higher education market is a good example, and there is substantial evidence that suggest that attending an elite university pays off in the labor market. For instance, Brewer et al. (1999) documents that even after controlling for the quality of students at the timing of entering colleges, there is strong suggestive evidence that economic return to attending an elite private institution in the U.S. has increased over time.

58) To list two important development related to this: an increasing number of foreign companies branched out to Korea, and the number of new small and medium venture firms soared.

to individual abilities and performance rather than education, schools, or seniority have spread. Indeed, many large leading Korean companies have started to adopt a more diversified and programmatic recruitment criterion which incorporate various individual competence or quality measures in addition to final academic diploma and standard scholastic achievements such as GPA.⁵⁹ As several survey results confirm, the payment system based on seniority and academic credentials is yielding to the new system of performance- or contract-based payment scheme.

Table 22. Proportion of firms adopting contract-based employment scheme

Survey Study done by	Survey years	Type of Firms surveyed	Firms with contract-based system (%)
Korea Employers Federation	1994	with 50 or more employees	4.0
	1996		7.2
	1998		15.3
Ministry of Labor ⁴⁾	1996	with 100 or more employees	1.6
	1997		3.6
	1999		12.7
Korea Labor Institute	1998	Firms opened public	23.0
	2000		45.2

Source: reproduced from Kim (2002).

Certainly, social and cultural environment cannot be altered over a few years. However, the transformation set off recently is projected to extend rapidly to all occupations and workplaces as the restructuring of the Korean economy continues in the future. In this kind of competitive and flexible labor market, all higher education institutions are hard pressed to establish themselves anew and develop differentiated programs suitable for meeting specialized line of market demand, as well as trying to select students with special attributes suitable for their programs. Old reputation will persist, but will gradually lose weight. Though modest, there is a sign that the long-standing, monolithic hierarchy of Korean higher education market is already in course of wearing down, with traditionally low or mid-ranked institutions coming out strong through innovative efforts.⁶⁰ Furthermore, regardless of the final outcome of new reputation race amongst the higher institutions, the overall reputation of an institution will count relatively less in determining the market status of its graduates through their career cycle. To that extent, the incentive and competition for entering the better or higher ranked institutions will diminish. In short, a new social and economic environment is forming up for a new stage of open and fair

⁵⁹⁾ Samsung Electronics, one of the most prominent corporate firm of Korea, leads this new market trend. In 1996, Samsung introduced a new, quite sophisticated recruitment criterion, combining its own-designed SSAT (Samsung Aptitude Test) and presentation interview. Academic credential does not count explicitly by itself, but only through SSAT and interview. Reportedly, SSAT is a quite sophisticated, but practical enough tool to check up all relevant competence, qualifications and attributes of prospective employees. SSAT consists of AI(Academic Intelligence), designed to measure basic cognitive abilities, and PI(Practical Intelligence), designed to measure all other non-standard, not easily-quantifiable capabilities needed in real business practices (Ahn [2000]).

⁶⁰⁾ For instance, a kind of lumpy, lexicographic ranking used to prevail in Korea such that any 4-year university is perceived as superior to any 2-year junior college in terms of overall market status. A study by Kim and Lee (2002) shows that this is no longer true. Analyzing the hierarchy structure of Korean higher education market, they found that although top 20 per cent of ranks are dominated by 4-year universities, in the middle range of ranks, many junior colleges, mostly located in Seoul metropolitan area and specialized in nursing and computer, are very competitive. This fact alludes that the new environment is ripe for an innovative junior colleges to out-compete a group of mediocre universities, offering quality diplomas well received in the labor market.

reputation contest among higher education institutions, which eventually could help Korea overcome the chronic problems of fierce college-entrance competition.

D. Enlarging and ever diversifying demands for college graduates

As mentioned already, a surplus of college graduates in the market is a big concern in Korea today. However, such concern may be oversubscribed, and need to be addressed more carefully. It is useful to approach the surplus issue by first distinguishing two distinctive concepts involved: over-education and over-capacity. Over-capacity means that there is a shortage of students pursuing higher education and higher institutions as a whole cannot find enough number of students. Over-education, on the other hand, means a shortage of economic demands for college graduates – that is, some students attend colleges education when their jobs after graduation do not require college background. Defined this way, over-education problem may exist even when there is no over-capacity problem.

Taking the surplus issue in the sense of over-education, surplus means that the expansion of Korean higher education has occurred excessively for its economic needs, but not the expansion was not principally driven by social demands. Although a considerable structural gap remains between Korea and the world's leading nations, Korea's economic structure is advanced enough to accommodate a substantially large body of college graduates. Korea already belongs to the world's leading group in terms of the share of the knowledge-intensive business activities. As of 1998, Korea's value-added share of the knowledge-intensive manufacture (high-tech plus mid-tech) stood at 12.6 per cent, the highest among the OECD nations' only after Germany's. Although Korea falls short of the OECD average in the knowledge-intensive services, the total combined share of knowledge-intensive services and manufactures is on a par with the OECD average.

Table 23. Shares of Knowledge-Intensive Industries among Nations: Value-added in Total Gross Value-added (1998)

(Unit: %)

	High-tech Manufactures	Mid-tech Manufactures	K-intensive Services	Education & Health	Total 1	Total 2
Korea	5.6	7	13.5	7.8	26.1	33.9
United States	3.7	4.8	21.5	11.6	30	41.6
Japan	3.6	7.1	14.1	-	24.8	-
Germany	2.1	9.6	19.3	10.3	31.0	41.2
France	2.5	4.9	19.1	11.7	26.4	38.1
Italy	1.6	5.6	16.0	9.5	23.3	32.8
OECD AVG	3.1	5.7	18.2	-	2.7	-

Note: Total 1=HT+MHT+KIS, Total 2 = Total 1 + Education & Health

Source : OECD (2001c)

Despite some short-term uncertainties lying ahead, Korea's economic structure will continue to be upgraded, with the shares of the knowledge-intensive activities increasing

further.⁶¹ In parallel, the demand for the highly educated manpower will keep increasing in both manufacturing and service sectors. The quickly growing East Asian market will provide fuels and platform for Korea's continued process of industrial and manpower upgrading. Although the total employment share of the manufacturing is likely to decline slightly, the demand for engineers and high-level managerial staffs will increase, pushed by strong demand from Korea's leading industries such as electronics and automobiles. The upgrading of workforce will take place most visibly in the service sector, with professional business services (consulting, marketing, and etc.) and social and individual services leading the trend.

In creating a sizable volume of high-quality jobs suitable for college graduates, traditional business such as social and personal services will play a specially important role. Traditionally, the service sector largely constituted the stagnant, low-productivity segment of an economy, mostly serving to accommodate low to intermediate quality labor unsuitable for skill-demanding manufacturing jobs. In sharp contrast, the service sectors of the leading advanced nations of today are becoming the most dynamic and productive sector of an economy, driven by high-quality labor force engaged in highly challenging knowledge-intensive production.⁶²

Table 24. Employment Distribution of College Graduates across Business Sectors

(Unit: thousand persons, %)

Business	Agriculture & Fishery	Manufacturing	Utilities	Construction	Wholesale, Retailing, Restaurants & Hotels	Transport & Telecommunication	Finance, insurance, & business services	Social & Personal services	Total
Junior college graduates									
1993	16(1.9)	201(24.1)	3(0.4)	60(7.2)	196(23.5)	34(4.1)	73(8.7)	251(30.1)	834(100)
2001	15(0.9)	297(18.4)	11(0.7)	113(7.0)	387(23.9)	87(5.4)	269(16.6)	440(27.2)	1,619(100)
University graduates									
1993	37(1.4)	480(18.8)	19(0.7)	163(6.4)	471(18.4)	109(4.3)	336(13.1)	940(36.8)	2,555(100)
2001	41(1.1)	557(15.1)	17(0.5)	209(5.6)	687(18.6)	181(4.9)	681(18.4)	1,322(35.8)	3,694(100)
Workforce Total									
1993	2,849(14.7)	4,730(24.5)	65(0.3)	1,689(8.7)	4,852(25.1)	1,007(5.2)	1,361(7.0)	2,776(14.4)	19,328(100)
2001	2,193(10.3)	4,219(19.7)	56(0.3)	1,575(7.4)	5,820(27.2)	1,322(6.2)	2,244(10.5)	3,932(18.4)	21,362(100)

Source: National Statistical Office, Workforce Survey, 2002

⁶¹ The value-added share of the knowledge intensive industries has increased from 26.1% in 1990 to 36.2% in 1998 (See Annex table)

⁶² Tertiarization of an economy (expansion of the services sector) is a worldwide phenomena, observed most conspicuously in the highly advanced, knowledge-intensive economies. The underlying forces behind this process are well documented: the rising level and diffusion of information and information technology that have permeated every aspect of productive work; considerable blurring between pure manufacturing and pure service activities; and increased outsourcing of core service functions of firms partly caused by organizational reform and development of new industry-wide networking. For a succinct summary of this new trend, see OECD (1991) and OECD (1996a). For comprehensive discussions of the old 'tertiarization' and 'new tertiarization', see Daniels(1993) and Elfring (1988).

In Korea, the service sector has expanded steadily, but its overall productivity remains quite low when compared to the manufacturing sector of other advanced nations.⁶³ Productivity gap is the most notable in traditional services such as social and personal services. This appears to be a quite puzzling phenomenon because, in terms of the educational background of workforce, social and personal services constitute the most knowledge-intensive sector of the Korean economy, with about one third of all college graduates working there.

However, this could change in the near future. The productivity gap of Korea's service sector, including social and personal services, is already being reduced at a steady pace. The demand for social and personal services will not only keep growing, but also become more sophisticated and diverse. This trend is likely to gain momentum and accelerate, with the new dynamism emanating a new generation of college graduates placed there. Already, an increasing number of new college graduates with humanities background have entered various areas of traditional services, and there is a sign that they started to create a thread of new 'business culture' and soft-innovations into otherwise stagnant and backward business atmosphere. Certainly, it will take a long time for this trend to become a new norm, transforming the traditional services business into a truly knowledge-intensive, innovative workplace suitable for college graduates. But there is a good chance that a combination of both the supply and demand forces at play now would work together to result in such transformation.⁶⁴

The above discussion essentially points out that the prevailing concern over the surplus of college graduates in the sense of 'over-education' may be over-subscribed. The above discussion also suggests that the other dimension of the surplus argument, which is 'over-capacity', may be over-subscribed as well. Underpinning the over-capacity argument are two trends: the declining size of college student body, which is already underway and projected to continue, and the possible decline of interest in higher education itself. In this regard, the growing demands for college graduates of business forefronts, discussed above, will provide pure economic ground for a stable and large portion of high school graduates to continue to seek higher education, thereby mitigating the threat of over-capacity to that extent. An additional, and more important factor here is the substantial size of additional demands coming from the existing workforce who seek continuing education at higher education institutions. Korean society's level of interest in lifelong education is still low and policy incentives are not provided adequately.⁶⁵ After the currency crisis, however, structural reform has made the labor market much more flexible and taught people that they should improve themselves through continuous learning. Against this backdrop, a trend has set in - the demand for lifetime education is rising fast. Under the premise that Korea's higher education is re-shaped or re-oriented to absorb such new demand

63) As of 2001, the services sector in Korea accounts for 52.7 % of GDP and 61.1% of employment. The labor productivity of Korea's services sector (2.1) is about 2/3 of Korea's manufacturing sector (3.0), and about a half of the average service sector productivity of the US, Japan, Germany, Italy, France (4.4).

64) Since the late 1980s, the Korean economy began to exhibit clear signs of so-called tertiarization process, characterized by the persistent dwindling of manufacturing sector accompanied by the rapid expansion of the service sector. Indeed, the weight of the service sector in today's Korean economy (both in GDP or employment) is considerably higher than in most other nations with similar incomes and also higher compared to the highly advanced nations when they were in a comparable stage of development to Korea. This early tertiarization of the Korean economy led some observers to speculate that it has already entered the stage of 'de-industrialization', earlier than most would have anticipated, and with that, the competitiveness of Korea will gradually erode in foreseeable future. However, viewed in conjunction with the unique human resource base of Korea (the rapid expansion of higher education outpacing its income growth) and the new techno-economic conditions prevailing in the world economy, a different interpretation can be made. That is, there may be a meaningful correlation between the early and rapid tertiarization of education sector and the equally early and rapid tertiarization of the overall economic activities. In author's view, this is a theme in need of more rigorous and careful research.

65) As of 2000, adults participation in lifetime education amount to only 17.2%, among the lowest in OECD (The OECD average ranges from 30~40%).

effectively with the help of appropriate government financial support, there is a good chance that most of its existing capacity can fully be utilized.

E. New Policy Environment Emerging

As discussed already, much of the deficiency of Korea's higher education system can be attributable to the tight control and regulation imposed by the government. Although 'deregulation', which has become a policy thrust since the mid 1990s, will play a vital role in making Korea's higher education more resilient and responsive to market demands, deregulation by itself may not be sufficient enough to ensure intimate interplay between higher education sector and business sector. In Korea, policy efforts to link colleges to industrial sector have been very weak. By and large, the policies on higher education were pursued in a kind of 'supply-oriented manner' without enough attention given to their linkages with other policies regarding labor market, R&D, and industrial development. Also, although many ministries other than Ministry of Education came to assume an increasing greater role regarding higher education, mainly through their research funding, there has been no active coordination of those activities across ministries.

A quite meaningful, fundamental change has recently been made in this regard. In 2001, the 'Ministerial Commission for HRD' was launched, and subsequently the Ministry of Education was reconstructed as the Ministry of Education and HRD⁶⁶. Together with such organizational shake-up, a new policy approach was set forth to address educational issues in an integrated, general equilibrium framework with a range of demand-side issues such as R&D, industrial development, and workforce support. In this vein, there has been a new policy drive and feats such as the preparation of a comprehensive 'National Human Resources Development (NHRD) Strategies for Korea' and the promulgation of 'NHRD Act'.⁶⁷ Most notably, amid acute recognition that higher education constitutes a critical interface between the supply and demand of education, a greater policy emphasis has been placed on higher education, especially on the university-industry linkage. University-industry linkage holds a key to Korea's endeavor to upgrade its industrial competitiveness as well as higher education. University-industry cooperation⁶⁸ in Korea has been very weak in the past. But this would change in the near future. All involved parties are keenly aware of the value and necessity of cooperation more than ever before.

66) In February 2001, the former Ministry of Education was transformed into the Ministry of Education and Human Resources Development with the promoted rank of its head as newly installed deputy prime minister of HRD. The MOEHRD is empowered to oversee and coordinate all major policies related to the development and utilization of human resources, such as vocational training, research and development, unemployment plans, and social integration. On the other hand, the Presidential Commission on Education and Human Resources Policy was established to set mid and long-term policy visions on development and utilization of human resources. It submits evaluative reports regularly to the President on the status of policies implemented by various government agencies.

According to one count, roughly 600 policy tasks out of the 225 HRD tasks are dispersed across 28 department, divisions, and offices. Although HRD policies and programs were so much dispersed across several ministries, policy coordination across ministries was very limited before the launching of HRD committee. university research support was one of those areas that contain possible overlapping of programs and lack of consistency.

67) The NHRD Strategies Report sets policy objectives and implementation strategies regarding the development and utilization of human resources, will be revised every five years by law. For each of the policy tasks identified in the strategies, respective implementation plans are being prepared by the responsible ministry forming policy networks of relevant ministries, local governments, businesses and civic groups. "The NHRD Act" was enacted in August 2002 to support HRD policies by legally empowering the Deputy Prime Minister to oversee and coordinate the related ministries. The Act includes periodic revision of the National Human Resources Development Strategies for Korea, formation and operation of the Ministerial Commission for Human Resources Development, evaluation of policy outcomes based on analysis of investment in human resources development, and overall management of HRD information.

68) More generally speaking, triangular cooperation among industry-academia-research institutes [IAR]

Through continued efforts by several ministries since 1990s, a solid body of H/W infrastructure and core institutional elements are in place. Universities have adequate human resources and research capabilities to meet the needs of industries regarding industrial research.

Though limited, an increasingly large number of firms are turning to universities for R&D and development of industrial technology. Already, a sizable volume of 'business R&D resources of Korean companies are in the market and Korea's R&D spending is one of the world's highest (in GDP share), about 75 per cent of which is funded by private companies. All these mean that basic condition is ripe for a new mode of university-industry cooperation to emerge.

Of course, all these new policy initiatives are quite recent and have not been firmly rooted down yet. Considering the lack of experience in policy collaboration and coordination among the involved government bodies, it will take a while for this new endeavor to root down and generate intended results. Also, there remains huge uncertainty whether the new administrative architect with the MoEHRD at the summit will sustain itself, spanning over political cycles. Nonetheless, this series of changes constitute revolutionary changes in policy framework, and may well be expected to bring about the energy needed to vitalize Korea's higher education system.

4-2. Significance and Direction of Reforming Korea's Higher Education

A. Implications for Korea's chronic educational ills

Upgrading of Higher Education holds a key to Korea's endeavor to sustain its growth momentum and to make a successful transition into an innovation-oriented, knowledge-based economy. Without quality universities, it is impossible to meet ever-demanding technological and manpower needs of Korean firms, not to mention those of foreign multinationals seeking a new regional platform in the East Asian market. Improved tertiary education is also necessary for sustained progress in Korea's basic education. By providing qualified teachers and school leaders, and by enhancing the capacity for curriculum design, research on teaching and learning, and economic analysis and management, tertiary education buttresses the economic externalities produced by lower levels of education.⁶⁹

Concerning its effect on the lower level of education, upgrading of Korean higher education has another special implication associated with a somewhat peculiar dimension of the Korean education system. As is well known, Korea's basic education sector has long been plagued and overshadowed by the three intertwined problems of 'private tutoring', 'test-oriented schooling', and 'severe college entry competition'. Despite strenuous and variegated policy efforts made so far in Korea, including changes in school curriculum, college entry test, and college admission quota, and even the outright banning of private tutoring in 1980, these triplets of Korean education stand just robust without any sign of giving away.

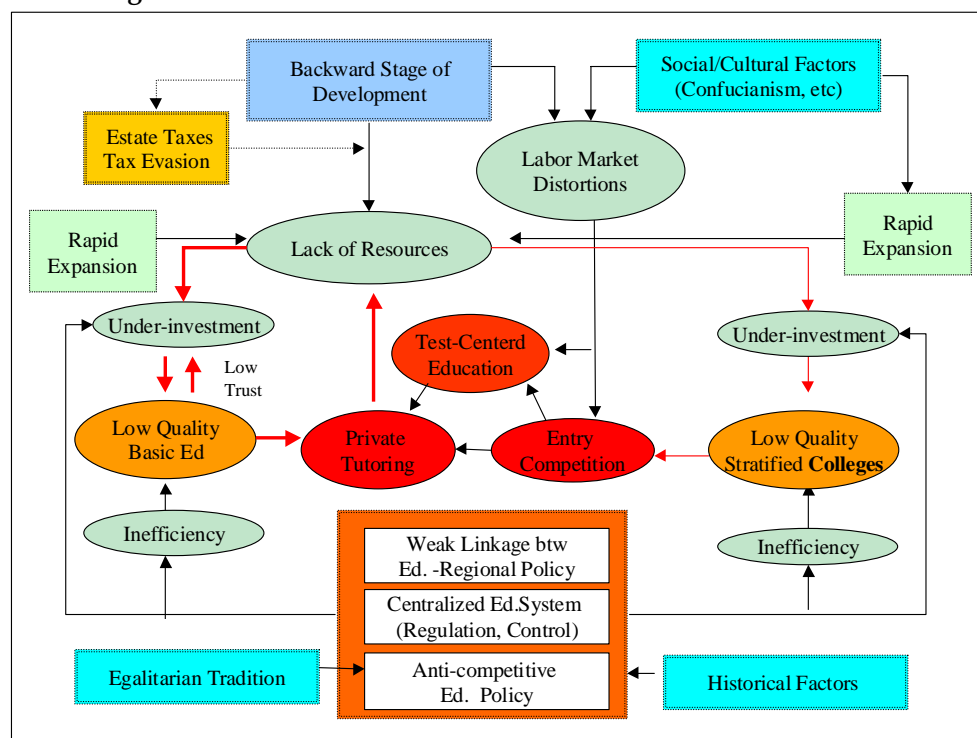
The diagram below illustrates how the three problems (highlighted at the center area) are inter-related to the problems of basic and higher education sectors (depicted in the central-left and center-right regions) and what structural and environmental factors underlie all these problems (identified in outer region). Note first that the troublesome

⁶⁹) See the World Bank (2001) for detailed discussion.

triplets make both the cause and outcome of the problems of the regular education sector, involving not only the basic education sector but also higher education. Note next that 'low quality' basic education and 'highly stratified, low-quality' higher education have a common structural problem as they both result from under-investment and inefficiency. Note finally that the under-investment and inefficiency of the regular education sectors root not only from some structural problems of the Korean education system itself, but also from a set of other underlying factors including the overall development stage of the Korean economy and Korea's idiosyncratic social and cultural environments.⁷⁰

As for Korea's three educational ills, the diagram helps illustrate how deep-rooted these problems actually are and why all troubleshooting measures deployed by the Korean government to date have been deemed to fail. The figure also suggests what it will take for Korea to successfully overcome these problems, and what implication the upgrading of Korean higher education has in such context. Put simply, no quick-fix policy measure within the easy control of the educational authority will be effective. It will take not only fundamental reforms geared to tackle structural inefficiencies of both basic and higher education, but also progressive changes in social and economic factors underlying the overall performance of the Korean education system. Upgrading of higher education is pivotal, though clearly not sufficient or effective by itself, to curing or alleviating these long-standing maladies of Korean education. Focusing on the role of higher education, one fact deserves special mentioning: setting aside cultural and social factors, low-quality rapid expansion of the college sector may be viewed to have contributed to aggravating, rather than relieving, Korea's educational ills by enlarging the pool of prospective contenders (and the hopeful) competing for a limited number of first-tier college entrance slots.

Figure 2. Schematic Illustration of Korea's Educational Problems



70) A more detailed explanation of this diagram can be found at Woo and Lee(2001)

B. Approach and Policy Goals

As discussed above, a set of favorable factors are in place for successful transformation of Korea's higher education sector, which implies that the condition is ripe for Korea to tackle its chronic "educational ills." However, capitalizing on such favorable environment is a truly formidable task. The problems of Korea's higher education are very complicated, involving numerous stakeholders with different, even conflicting interests. All interested parties agree on the policy objectives of attaining 'greater flexibility, diversity, and excellence'. Also, everybody agrees that attaining these goals would take a series of fundamental, thorough, and systematic reforms. But no comprehensive reform blueprint has been formulated in Korea yet. As mentioned earlier, with quantity-expansion completed, Korea is situated to focus on "quality reform", but 'quality reform' in itself means trade-offs of interests among the existing constituents. In this sense, over-expanded higher education sector of Korea poses a huge challenge for any comprehensive reform to be undertaken. A huge college sector and vested interests posit a formidable barrier to any drastic top-down reform attempt.

In essence, any drastic reform, or so-called 'big bang' reform measure, which could affect a substantial body of constituents in a substantive manner, is neither feasible nor desirable. The basic approach needed for a successful transformation of Korea's higher education is envisaged in the latest report "National Human Resources Development Strategies for Korea." The Plan basically takes hold of an evolutionary approach, aiming at a gradual restructuring and self-selective upgrading of tertiary sector. As mentioned already, the overall demand and supply conditions surrounding Korea's higher education sector are quite amenable for such changes to take place. Especially, with private universities and colleges taking up a dominant portion of the market, Korea's higher education market is highly amenable for competition-oriented, market-based policies. The role of the state and the core objectives of a systematic reform that Korea needs at the moment is thus to firmly establish a new market environment conducive to fair, innovative competition amongst schools and faculties in which parents and students' right to choice is guaranteed. Once such system is in place, some innovative schools will show up, and their influence and performance will gradually dissipate to other groups and organizations.⁷¹

⁷¹) Often, the government policy on higher education is tainted by a unrealistic vision of "nurturing plenty of world-class universities under government leadership. Simply speaking, it would be totally imprudent to try to make all universities to become research universities, and all professors to productive researchers.

CHAPTER 5

Policy Agendas Lying Ahead

5-1 Creating an Open, Contestable Higher Education Market

University is the most resource-intensive of all educational institutions, which means that improving its quality is very difficult without a long-term, stable investment. Due to the limited financial capability of the government, it is almost impossible to raise the standard of all universities substantially by drawing on public funding only⁷². Therefore, the key to further enhancement of universities would be to revamp the current college management system to absorb as much potential private financing as possible. In the meantime, in order to utilize the invested resources in a more efficient manner, universities could be put on a level playing field that would facilitate competition for innovation and differentiation.

More specifically, universities should be allowed to determine their own tuition as set out by the current plan. Meanwhile, special exceptions should be made so that they can introduce a corporate style management in terms of service, finance, accounting, personnel, compensation, and etc. Nowadays, the rationale is weak for the state to treat national universities favorably for promotion of public good or social equality. Private universities should be given tax benefits equivalent to those given to national universities so that all universities can compete on an equal footing. Furthermore, the controversial donation-based admission system needs to be embraced eventually, at a reasonable level, as it would serve as an extra source of funding for private universities. Of course, improvements should concurrently be made on the current college admission system so that universities can fully exercise their legal rights to select their students. Also, actions should be taken to ensure transparent and democratic operation of university, e.g. obliging universities to fully disclose all accounting-related information.

One way to increase diversity and practicality of higher education and to promote restructuring would be to support the establishment of technical colleges and corporate colleges in the private sector. Firms should be encouraged to transform their in-house training facilities into technical colleges. Another good possibility would be to encourage companies to jointly establish technical colleges. This would provide their workers with continuous learning opportunities and cultivate the right human resources that their industries demand. To this end, the government could subsidize operating expenses for technical or in-house colleges in the form of various tax cuts or deduction on unemployment.⁷³

⁷²) As of 2000, the government's financial support for institutions of higher learning is less than 10% of the total education budget, and colleges are managed mostly with private funds (78% of the total expenses for higher learning; 24% on average among OECD countries).

⁷³) There are three types of corporate colleges: corporate college(1), technical college(1), and corporate technical college(4). Corporate colleges, which can be established by company with more than 300 employees, offer junior college and 4-yr college programs. Technical college, which can be established only by school foundation formed by individual company, corporate body, and consortium of company and junior college, also provides junior college and college programs. Graduates from both corporate college and technical college get associate and bachelor's degree, authorized by the Minister of Education and HRD.

Current universities alone cannot meet all manpower demands from IT and other leading industries, because, in such industries, the rapid and unpredictable changes are the norm and international standards continue to reshape. A more effective approach would be to designate high-quality private institutes and training schools as official education institutions and nurture, through government support, them into specialized world-class institutions.

With a full-scale introduction of free competition, many universities and departments without a competitive edge will be rendered to close down or scale down. To that extent, quota restrictions on the total number of entry students have become less meaningful. Starting from private universities, quota restriction needs to be completely lifted so that the numbers of students can be adjusted according to market demand in a flexible manner. While quota on the total number of students in a given university should be lifted completely, introduction of an admission quota system with certain age restrictions and/or work experience requirements (e.g. 25 years or older, over 3 years of corporate experience) would help alleviate the overheated competition among high school graduates to enter college, and promote lifelong education in Korean society.

Nevertheless, universities should be free to determine their admission criteria and number of students within the scope set by the government. Furthermore, universities should be able to choose their own admission criteria and practice as freely as possible. Selection of students should remain as university's exclusive legal right. The government, or any other third party for that matter, would be violating the rights if they interfere with the student selection process. The current college admission system is particularly problematic, because it does not allow universities to take into account the academic gap among different high schools. It should be entirely up to universities to decide whether they want to reflect such qualitative differences in choosing their students, and if they do, what criteria and methods they should apply. Appropriate actions need to be taken soon to rectify the present situation. One solution would be for representatives of secondary education to participate in the coordination of the college entrance exams. This would improve the accountability and practicality of the admission system.

5-2 Re-aligning University Support Programs for Specialization and Differentiation

It is necessary to streamline the current university financing and accounting system, thereby inducing appropriate role divisions and specialization among them. As of 2001, an estimated total amount of 1.5 trillion won was extended as research subsidies to

Corporate technical colleges offer three levels of programs for selected employees: junior college, college, and graduate programs. Graduates from corporate technical college receive no official, marketable qualification (degree) from the program. Their qualifications are, however, recognized within an enterprise group with which the company is affiliated.

Although the importance of corporate education has been greatly emphasized, the numbers of the three types of corporate colleges are quite small. The number of corporate technical colleges decreased from 14 in 1999 to 4 in 2001 (one for 4-year college course and three for graduate courses in 2001) due to 1) economic crisis in 1997, 2) vocational competency development project which provides financial support, and 3) school-industry cooperation programs. There are only one corporate college and one technical college in 2002, which are Samsung Electronic Engineering College, established in 2001, and Jungsuk College, established in 2000, respectively. Samsung Electronic Engineering College has 2-year associate degree programs for digital engineering and digital display. There are only one corporate college and one technical college in 2002, which are Samsung Electronic Engineering College, established in 2001, and Jungsuk College, established in 2000, respectively. Samsung Electronic Engineering College has 2-year associate degree programs for digital engineering and digital display, while Jungsuk College has both bachelor degree program and associate degree program for business administration and electronic engineering.

universities by government ministries including the MoE&HRD, MoST and MoCIE. This might not be enough to increase research capacity of all universities, but using these resources in a more efficient, systematic way could help specialize them.

First and foremost, the various research projects of universities and enterprises sponsored by MoE&HRD, MoST, and MoCIE and other ministries should be readjusted so that consistent principles and standards can be applied when selecting and assessing the projects. For basic sciences, only research projects that meet the SCI quality standard should be supported so as to focus on a small number of prospective research-oriented universities. National R&D projects, industry-university-research institute consortium programs, and other government-funded programs should be streamlined so that leading engineering universities in the region can develop into institutions that efficiently meet local corporate businesses' needs for advanced technology and human resources. The rest of small universities should be developed so that they can provide on-site problem solving services and meet the technical needs of local SMEs.

In the future, domestic colleges and universities are likely to follow many different courses of development. Thus, it is difficult to foresee which type of university each will become. Therefore, categorizing universities in advance and allocating support based on the resulting classifications is likely to end up creating substantial distortion. A good option that could reduce the risk would be to increase support for individual researchers rather than for individual universities. After identifying such researchers and their placement in universities, the government could select larger units such as departments and colleges for sponsorship.

Another worthwhile measure is to install a separate organization to coordinate and monitor myriad of university research support programs of the government. Instead of forming an independent government agency similar to HEFA of England, it would be more practical to utilize a special sub-committee under the HRD Committee, thereby combining existing know-how and infrastructure to find better solutions.

An R&D Expense Accounting System should be introduced in order to help change and support structure of universities. Separate accounting rules should be devised and enforced for smooth implementation of research projects and effective management of their output (profits, assets, etc.). For R&D projects commissioned by the government, man-hour costs as well as indirect expenses should be considered in the accounting process that is based on a certain criteria conforming to the government guideline. In particular, it is important to recognize man-hour costs, because it would help secure full-time research professors.

5-3 Tapping onto Global Resources

Compared with the leading OECD nations such as the G-7 nations, Korea is in absolute shortage of high-quality human resources. Under such circumstances, it is important to tap onto the stores of knowledge and human resources abroad. However, the framework for the human resource supply system has not been liberalized, and measures such as inducement of foreign corporations and universities, participation in international joint research projects, dispatching of Korean human resources for overseas training, and etc. are all lacking. This will become more problematic, because advanced nations are stepping up efforts to attract and clinch high-quality foreign manpower, although they already have plenty of talents.

Diverse efforts should be made to promote joint international research and other forms of international collaboration. First and foremost, foreign companies in Korea should be induced to take greater part in national R&D projects and to play a substantial role in regional/local industrial development. Multinational corporations can directly transfer

advanced knowledge and technology to Korea and contribute greatly to making up of Korea's deficiency in 'core' system knowledge such as project management. In this context, related laws should be revised and discriminatory practices rectified so as to allow foreign researchers to engage in domestic R&D projects as project managers.

Other recommendations include participation in large-scale international research projects as a consortium member and introduction of new programs similar to Europe's "Training and Mobility of Researchers (TMR)." In spearhead technology fields such as BT, NT and ST, it is difficult to nurture top-notch R&D persons within Korea. Therefore, the government should actively promote overseas study or training program and support domestic firms to establish overseas R&D outpost or platform at important locations (centers of excellence) in advanced countries.

Moreover, extensive efforts should be made to attract world-renowned universities, quality education programs, and global leading talents to Korea. For this purpose, running joint programs with foreign universities is not sufficient. Korea needs to set about on a new long-term strategic drive to attract top-notch universities and graduate schools to Korea, following the model of Singapore. To this end, it would be helpful to dramatically ease the restrictions on establishing new universities and graduate schools, e.g. exempting them from the minimum property requirement.

Because Korea's socio-cultural climate is not favorable to foreigners, the country has not been very successful in attracting quality personnel from abroad. Therefore, the government should extend proper support to domestic universities so that they can invite brainpower from abroad with attractive conditions. In addition, the government should grant them considerable privileges in terms of immigration by extending period of their stay, issuing multiple entry visas and simplifying procedures. Turning places like "Daedeok Research Complex" into a "brain hub" with world-class conditions in all areas such as research, start-up, taxation, education, medical service, and housing, would be additional incentives for top-level researchers abroad.

5-4. Digitizing/Informatizing of Education

Aided by the worldwide IT revolution, long-distance education, cyber education and other alternative forms of education are expanding. The outcome of the education and HRD of a nation will be determined by its IT capabilities and underlying infrastructure. Although the forms of alternative education are still in the early introduction phase in Korea, education and training services are soon expected to grow into a larger, more specialized, and more globalized form, starting with universities and the job training centers. Korea has great capability to adopt and apply information technology. Already Korea is ahead in hardware infrastructure and basic capability to utilize IT, so Korea can respond proactively to the wave of the so-called network-based education/ learning revolution. The explosive expansion of the Korean ICT market since the mid-1990s clearly displays Korea's potential to utilize IT, which in turn roots down to the high education level and peculiar social and cultural characteristics of Korea.

In order to realize Korea's high potential for informatization, comprehensive efforts should be made to make drastic improvements in the areas of H/W, S/W, and related laws and institutions. As far as cyber education is concerned the greater the number of the users/participants, the greater its commercial value and impact become. During the initial stage of market formation, there is only a limited number of participants and hence, a high risk of market failure. The government support should focus on minimizing such market risk.

In the case of primary and secondary education, the government needs to invest more in the school informatization programs, because such investment is as important as investments in school facilities. As for university curriculum, on-line education should be relatively easy to start up, and then expand to all possible areas. Especially, H/W investment for international cyber education should be supported. To better accommodate the demand for quality, the government should take the initiative to develop and supply new content and set an operation model for supporting cyber education. In doing so, it should try to ensure maximum participation of private entities, including foreign companies. At the same time, it should promptly seek to revise the related laws and add various incentives to induce schools to opt for various cyber education programs, including joint cyber courses among schools. Instructors might feel uneasy about the idea of introducing regular full-credit cyber education courses, and this could be the primary obstacle blocking its implementation. Therefore, it is also important to come up with sufficient compensation for the affected faculty so as to gain their understanding and voluntary cooperation.

5-5. Reform of University Governance

A. National Universities

From the late 1990s, reforms of national universities have attracted serious attention of the various versions of the new public management, which is the policy expression of public choice theory. Its central feature is the focus on the importance of the public accountability.

The proposed reform agenda of national universities towards the 'Corporate model' appears to suggest four major directions. Those are institutional change to Agency, Board of Trustee system and/or introduction of special account system and devolution to provincial government entities.

Under the Agency model, the organizational border between the state and the university would become more distinct. The executive power is given to the president who would have full operational autonomy and accountability for his or her performance. Currently, 23 agencies are designated as target organizations to apply this new form of governance in Korea. This model is introduced as an alternative that would give incentives and rewards for accomplished achievement, since the organization system is client-oriented and performance directed. But each university's president is supposed to maintain contact with the soliciting committee on what should be done during the governing period. Nevertheless, the performance evaluation problem is a major weakness of this option.

The Corporate model transformation of national university is an idea resembling the governance of KAIST. Stable and sufficient resources and autonomous operation are assumed to be the key conditions for introduction of this form of governance. The corporate form of a national university is expected to have more autonomy in implementing academic programs and much more flexibility in budgeting. However, major obstacles may rise from distrust within each university. There may be serious concerns about the limits of securing sufficient financial support amid the strong competition with the private institutions.

Third seems to be the most feasible alternative for the time being as the budgetary reform would integrate two separate source of funds of each national institutions to one, taking the form of an independent national university special accounting system. This reform contributes to enhancing collective financial autonomy of national institutions and to fiscal efficiency through revenue and expenditure analyses of the whole picture,

including benefit and cost analysis of the major projects. This alternative may also invite complicated conflict of interest between inside and outside of the institutions.

The fourth alternative is a devolution option. This concept requires coalition of community collaboration of industry-university-research centers and it is expected to induce some competitiveness through synergy effect in local economy and university. We see the cases of cooperation among local government, industry, and major research university such as the Silicon Valley region with the Stanford University and Route 21 region with the North Carolina University. However, this option has a major problem of fiscal dependence on local (provincial) government or, for the Seoul metropolitan area, on the state.

B. Private Universities

Legally, a Korean private university is supposed to be a non-profit organization (NPO). However, many private universities do not abide by this non-distribution constraint in practice. Those universities are NPOs only in name, because they bend the most fundamental condition to be NPOs.

The table below shows the increasing frequency of conflict over financial transparency, personnel mismanagement, and suspected embezzlement in private universities. Inevitably, consumer protection problems are serious in those disguised NPO universities and it legitimizes the ex ante prudential regulation and inspection of the government for guaranteeing the quality of service at private universities. Especially, in higher education, it is quite difficult to audit accounts, and hence the detailed regulation of input process by the government.

Table 26. Number of Conflicts in Private Universities

	1995	1996	1997	1998	1999	2000
Temporary Board Member	4	4	7	9	10	9
Government Audit	3	-	-	3	9	5

Source: Park (2001)

Firstly, private universities should abide by the non-distribution constraint for greater transparency of their corporate governance. Institutional mechanism that enforces the mandatory non-distribution constraint should be the core reform agenda for private institutions. For this purpose, we have to enforce them to reveal information on decisions by the board of trustees and make it obligatory for every private university to submit certificate of external audit. Currently, this obligation applies only to university with over 2000 admission quotas.

Secondly, we need to strengthen the accountability of management of private universities to other stakeholders, such as faculty members, staffs, alumni, communities, parents, and students, beyond its founder and its successor. This is the same idea of residual claims in the theory of corporate governance, such as investors, lenders, and employees. Especially, we have to focus on the role of donators as a major stakeholder authority. We would legislate for broad participation of stakeholders, including major donators, in university management councils. In addition, to every stakeholder, the universities should report their financial statements such as tax payment, salaries of

managers and employees, donation amount, and etc.

Thirdly, under the condition of fulfilling transparency and accountability of private university's governance, regulation of governance structure has to be liberated. Currently, the MOE approves each new appointment of board members of private universities and has the authority to invalidate the approval. For the enhancement of public interest of private institutions, it needs to be stressed that active participation of stakeholders as well as effective monitoring of the non-distribution constraint condition are important. It is better than direct regulation of the MOE regarding the matter of qualification, approval, and cancellation of board membership. In addition, guaranteeing transparency and accountability of corporate governance structure of private institution, government regulation should be deregulated much further for general issues of private university management. As in Japan, if there is a conflict in a private university, we need to leave it to verdict of the court rather than direct involvement of MOE such as dispatch of public interest board member. We could further the liberalization of curricula, school operation, student recruit, and etc. and change the old system of approve-everything to simple reporting of major changes.

As explained above, higher education enrollment is likely to shrink substantially in the near future. This means that some higher learning institutions would inevitably go bankrupt. Therefore, it would be a prudent move to devise ways in which merger or exit can take voluntarily place in the marketplace. In principle, public universities can be merged or eliminated at the will of the government under the current law. However, such actions would prove politically very unpopular with the faculty and students of the institution. Therefore, it would be desirable to create a more decentralized governance system with greater financial autonomy at the institutional level before a major crisis happens, and to encourage the decision-making body to adjust more flexibly to the market changes.

Some of unsustainable private universities can be merged into one with better financial situation as long as the acquisition benefits the involved institutions. Some private universities, however, may not find a suitable merger partner. Also, the major stakeholder, such as the founder or chairman of the board, may delay the merger or exit since merger means the loss of his or her control of the institution. As previously explained, the government has not allowed for-profit higher learning institutions, although many private universities in Korea are de facto for-profit institutions. As long as the founder controls the board, he or she can benefit personally from the operation of the university, even though the institution may accumulate heavy debt. This moral hazard can be reduced, if not totally eliminated, by allowing institutions to become for-profit. There already exist a large number of for-profit technical schools (hakwons) that teach job skills, such as hair styling, cooking, and automobile repair, and they are quite similar to some 2-year colleges. By allowing some private universities to become for-profit, the government may be able to eliminate the holdout problem of the major stakeholders. Similarly, a buyout can be arranged to the major stakeholders when they contribute substantial financial resources as a founder or the founder's immediate family. If an effective and transparent board could be set up by removing the founder's influence, then the long term prospect of the university could be improved by the buyout.

5-6. Revamping Legal Framework and Upgrading Information Infrastructure

The establishment of a comprehensive information service for the supply and demand of manpower is required. First, the existing information-sharing mechanism needs to be

improved so that the labor market conditions, including demand of different industries, can be passed onto the educational system quickly and accurately. The final supply and demand decisions on education and training should rest with the individual providers and recipients. Whether or not they can make rational decisions, however, depends on the accessibility and quality of the information system, which is beyond their control. Accordingly, infrastructure for accurate prediction of manpower supply and demand should be built, and it should duly reflect trends in the labor market. Development of a foresight model on manpower supply and demand would help reduce the costs of civilian trial and error arising from lack of information.

In related matters, it is also necessary to build an integrated information network that links education, career, and employment information systems being separately operated by various government agencies and organizations. That is to say, an overarching system for manpower-related information networks that are built or being used by different organizations (EDU-net, lifelong education centers, career-net, work-net, occupational training information network, K-edu net, and etc.), that connects them and allows mutual usage is in order. Providing a one-stop information service for professions, job opportunities, and counseling is another way to reduce civilian trial and error caused by lack of information.

Furthermore, certificate-related laws and ordinances should be thoroughly reviewed. There needs to be a linked or integrated certification system at the national level, encompassing national certificates, private certificates, certified private licenses, occupational ability certificates, and etc. Ultimately, the main purpose for reviewing certificate-related regulations should be to eliminate the current restrictive system led by the state and to strengthen the functions and roles of the private sector instead. It is important to change the direction of the current certificate system and lift existing restrictions on private certification so that, eventually, private entities can also manage and operate diverse individual licenses.

The basic framework of the national manpower cultivation system is set in the laws and regulations on regular education and training institutes. In order to escape the legacy of the bureaucratic, supplier-centered control by the government and to achieve real autonomy of education and training institutions, the government should review all relevant laws and ordinances from scratch and re-create them according to today's demand. This should entail a phased shift from a positive system of "comprehensive regulation, selective approval" to a negative system of "comprehensive approval, selective regulation." In particular, all education-related laws and ordinances should be subject to full review, and the very building blocks of Korea's present higher education system including the Higher Education Act needs to be rewritten all again for the better.

Appendix: Theoretical Models of College Entry Competition and Prisoner's Dilemma

In the main text, we argued that Korea's troublesome 'private tutoring (Gua-Woi in Korean)' problem could be mitigated or overcome if the present hierarchical structure of higher education and overall economic and social environments change and reduce the college entry premium. Elaborating on this argument slightly, this appendix formulates simple exemplary models of college entry competition, highlighting the so-called prisoner's dilemma aspect of entry competition and its associated 'private tutoring' problems. Without attempting full-fledged theorization, this just intends to show how an allegedly socially wasteful entry competition problem can be analyzed in a formal game-theoretical framework. Policy implications of the models' analysis are suggested at the end.

1. Basic Model

We start with a very simple two-person symmetric game, assuming the following:

Nature of Game: There are two players (pre-college students), indexed 1 and 2, who potentially contend for one college slot (fixed). The more you invest (in a pre-college stage of education), the higher is the chance of winning (entering college).

Cost and benefit of educational investment: Each player can invest either one-unit resources or none. Regardless of the final outcome of the game, the minimum benefit amounting to one half of one's own investment is guaranteed. This reflects the presumption that investment made for entry competition is not a total waste, although some wasteful element is involved.

Pure premium for the winner (pure college rent) is 3. Therefore, when one invests and wins (or loses), the benefit will be 4 (or 1/2). When one does not invest, the benefit will be 3 when wins, and zero when loses. To sum up the cost-benefit structure of this game:

Investment Cost	Gross Return
1	If win, 4
	If lose, 1/2
0	If win, 3
	If lose, 0

Winner Decision Rule: If both or neither of the players invests for entry, the chance of winning is 1/2; if only one player invests, then that player will win.

Player's Decision: Each player makes an investment decision ("invest" or "do not invest") based on the expected net benefit of investment, ER:

$$ER = p R_w(C) + (1-p) R_L(C) - C,$$

Where p is the probability of winning, C is the investment cost, and R_w and R_L are gross returns accruing to the winner and loser, respectively.

Under this setup, the outcome of the game in respect of the expected net returns will be as follows:

$$\begin{aligned} [S1] \text{ when } C(1)=0, C(2)=0 &\rightarrow ER(1) = ER(2) = 1.5 \\ [S2] \text{ when } C(1)=1, C(2)=1 &\rightarrow ER(1) = ER(2) = 1.25 \\ [S3] \text{ when } C(i)=1, C(j)=0 &\rightarrow ER(i) = 3, ER(j) = 0 \quad (i,j = 1,2; i \neq j), \end{aligned}$$

Therefore, the payoff matrix of the game will look like this:

		Player 2	
		Invest	Don't Invest
Player 1	Invest	1.25 \ 1.25	3 \ 0
	Don't Invest	0 \ 3	1.5 \ 1.5

As can be easily confirmed, this game has a unique Nash equilibrium corresponding to the case [S2]: both players invest 1 unit of resource for the expected net benefit of 1.25. The realized outcome is: one will get 4, and the other, 1/2. In terms of expected welfare, this equilibrium is clearly inferior to the situation [S1] in which no player makes investment for the expected benefit of 1.5 -- the case of prisoner's dilemma.) In terms of the total realized returns accruing to two players, however, the 'bad' equilibrium which yields total gross returns of 4.5 is superior to the good equilibrium which yields 3. This observation indicates that this kind of issue involves some aspect of inter-temporal trade-off problem.

2. A Simple Extension

The model presented above can be extended and enriched in various ways, incorporating more realistic assumptions concerning the structure of payoff matrix, players' investment and decision rules, etc. Here we produce a simple extension that helps deliver how sensitively the equilibrium outcomes of the game change with respect to the underlying payoff structure.)⁷⁴

Retaining all other assumptions of the basic model, we now modify the cost-benefit structure as follows:

Investment Cost	Gross Return
C'	If win, $c' + \alpha$
	if lose, $c'/2$
C	if win, $c + \alpha$
	if lose, $c/2$

where α is college premium and c' and c are two investment alternatives subject to players' choice ($c' > c$).

⁷⁴) The model can be extended further in various directions. One interesting and easily tractable extension will be endogenising the player's investment decision by, for instance, drawing on logit form of winning probability function. Another interesting extension may be a three party game among three players with heterogeneous abilities. Most challengingly, the game-theoretical frame of the present model may be grafted onto a simple life-time schooling choice model (for instance, Simon and Woo, 1995)

Under this modified setup, the expected net benefits of the players will be determined as:

$$[S1] \text{ when } C(i) = C(j) = c \rightarrow ER(i) = ER(j) = \alpha / 2 - c/2$$

$$[S2] \text{ when } C(i) = C(j) = c' \rightarrow ER(i) = ER(j) = \alpha / 2 - c'/2$$

$$[S3] \text{ when } C(i) = c', C(j) = c \rightarrow ER(i) = \alpha - c'/2, ER(j) = -c/2 \quad (i, j = 1, 2; i \neq j)$$

The payoff matrix of the game is therefore:

		Player 2	
		Invest c'	Invest c
Player 1	Invest c'	$(\alpha - c')/2 \setminus (\alpha - c')/2$	$\alpha - (c'/2) \setminus -c/2$
	Invest c	$-c/2 \setminus \alpha - (c'/2)$	$(\alpha - c)/2 \setminus (\alpha - c)/2$

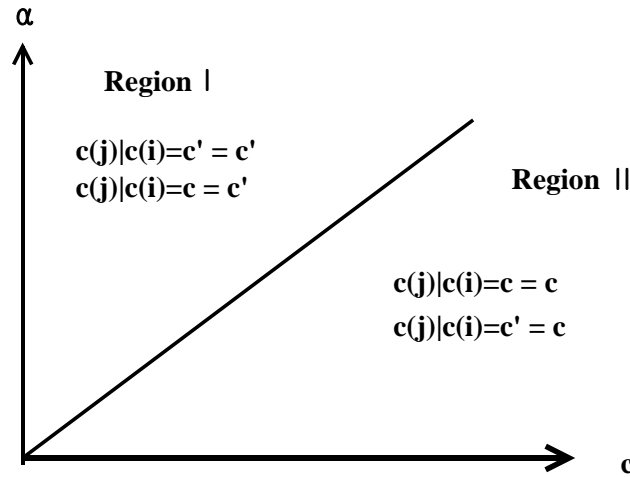
Critical to the players' investment choices will be the parametric values of α and $c'-c$. There are two possible patterns:

$$(s1) \text{ if } \alpha > c'-c, \text{ then} \\ c(j) |_{c(i)=c} = c' \quad c(j) |_{c(i)=c'} = c'$$

$$(s2) \text{ if } \alpha < c'-c, \text{ then} \\ c(j) |_{c(i)=c} = c, \quad c(j) |_{c(i)=c'} = c \quad (i, j = 1, 2; i \neq j)$$

where $c(j) |_{c(i)}$ denotes player-j's choice conditional on player-i's choice. In the case of solutions s1 and s2, each player has the same dominant strategy.

The figure below illustrates the above results in the $(\alpha, c'-c)$ space. Intuitively, when the college premium, α , is considerably high (low) compared to extra investment cost involved, $c'-c$, the individual will (not) invest heavily for college entry regardless of the contender's investment choice (solutions s1, s2).



It follows then that depending on the parametric values of α and $c'-c$, two distinct equilibrium configurations are possible for the game:

[CASE I]: If $\alpha > c'-c \Rightarrow [S2: C(1)=C(2)=c']$ is the dominant strategy equilibrium: case of

Prisoner's Dilemma; the equilibrium is 'bad' Nash

[CASE II]: If $\alpha < c'-c \Rightarrow [S1: C(1)=C(2)=c]$ is the dominant strategy equilibrium: Prisoner's Dilemma avoided; the equilibrium is 'good' Nash

In case I (Region I in the figure), given substantially high college premium (real or perceived), both players invest heavily for entry preparation, ending up at a lower-welfare equilibrium of a system (the prisoner's dilemma situation). In case II (Region II), quite low college premium induces both players to invest minimum, leading to a higher-welfare equilibrium.

Remarks:

The above analytical results, though obtained in a highly abstract frame, deliver a number of crucial implications for our discussion of Korea's 'private tutoring' problem:

- 1) Korea (and other East Asian countries with similar problems) may be viewed as being trapped in a bad equilibrium of high-investment and low-welfare as in the prisoner's dilemma situation.
- 2) The prisoner's dilemma situation may persist for a long while as long as the prevailing payoff matrix surrounding entry competition is maintained.
- 3) Under the prisoner's dilemma situation, any radical measure like total outlawing of 'Gua-Woi' or all sorts of micro-level troubleshooting measures such as changing school curriculum, scope and subjects of entrance exams, college admission system, and etc. will not work at all or have a very limited effect at best. The 1980 Educational Reform of Korea which banned 'Gua-Woi' as criminal activities may be a good example of a drastic reform which ignored prevailing incentives and thus ended up as a fiasco.
- 4) The payoff matrix surrounding entry competition will continue to change over time in line with the continued changes in key parameters such as 'real' and 'perceived' college wage premium and all non-monetary benefits of college education. The prisoner's dilemma situation then may be resolved eventually without any deliberate government action.
- 5) In the transition, however, the government may be able to help reduce the resource/welfare costs of overheated 'Gua-Woi' activities. For stance, policy efforts to dissipate all relevant information on the labor market could be highly effective, when the decisions of students and parents are misdirected due to lack of proper information or their past-dependent expectations.

Annex Tables

Table A1. The profile of Korean higher education in 2002

		Univ. ¹⁾	Univ. of Education	Industrial Univ.	Air & Corr. Univ.	Tech. College	Junior College	Misc.	Graduate School ²⁾	Total
Schools	National	24(1)	11	8	1	-	7	-	151	51(1)
	Public	2	-	-	-	-	9	-	13	11
	Private	137(18)	-	11	-	1	143(1)	4	781<18>	216
	Total	163(19)	11	19	1	1	159(1)	4	945<18>	358(19)
Total Enroll-ments ³⁾	National	367	-	86	367	-	14	-	77	834
	Public	21	-	-	-	-	25	-	3	45
	Private	1,384	23	101	-	-	924	2	183	2,435
	Total	1,772	23	187	367	-	963	2	263	3,314
Faculty Members	National	11,144	721	1,296	112	-	353	-	-	12,905
	Public	488	-	-	-	-	364	-	-	852
	Private	32,545	-	1,247	-	-	11,439	41	-	45,993
	Total	44,177	721	2,543	112	-	12,156	41	-	59,750
New Enroll-ments ³⁾	National	65	5	-	66	-	5	-	33	141
	Public	3	-	-	-	-	7	-	2	11
	Private	256	-	-	-	-	281	-	84	537
	Total	324	5	35	66	-	293	-	119	723

Note: 1) The number in () denote the number of local campuses, which are included in the total number of schools

2) The number in <> denote the number of independent graduate school colleges, which do not have undergraduate programs and run special graduate programs only.

3) In thousand persons

Source: Ministry of Education-KEDI, Statistical Yearbook of Education, 2002.

Table A2. Expansion of Higher Education in Korea

	1965	1970	1975	1980	1985	1990	1995	2000	2001	2002
1. No. of Institutions										
University	70	71	72	85	100	107	131	161	162	163
Univ. of Education	13	16	16	11	11	11	11	11	11	11
Industrial University	-	-	-	-	6	6	17	19	19	19
Technical college	-	-	-	-	-	-	-	1	1	1
Air & Corr. University	-	-	-	-	1	1	1	1	1	1
Univ. courses	31	16	15	1	24	23	18	3	3	3
Junior College	48	66	101	128	120	117	145	158	158	159
Junior College Courses	-	-	-	-	-	-	4	1	1	1
Undergraduate Total	162	169	204	225	262	265	327	355	356	358
Independent Graduate	-	-	-	-	-	-	-	17	18	18
Graduate School	37	64	82	121	201	303	427	812	887	927
Tertiary Total	199	233	286	346	463	568	754	1,184	1,261	1,303
2. No. of Student										
University	105,643	146,414	208,986	402,979	931,884	1,040,166	1,187,735	1,665,398	1,729,638	1,771,738
Univ. of Education	5,920	12,190	8,504	9,425	18,174	15,960	19,650	20,907	21,418	23,259
Industrial University	-	-	-	-	20,254	51,970	120,670	170,622	180,068	187,040
Technical college	-	-	-	-	-	-	-	100	198	200
Air & Corr. University	-	-	21,464	32,053	153,215	148,650	314,977	360,051	370,661	367,305
Univ. course	3,072	2,709	2,993	4,058	17,475	23,947	12,787	2,687	2,013	1,529
Junior College	23,159	33,483	62,866	165,051	242,117	323,825	569,820	913,273	952,649	963,129
Junior College course	-	-	-	-	-	-	4,419	1,074	645	380
Undergraduate Total	137,794	194,796	304,813	613,566	1,383,119	1,604,518	2,230,058	3,134,112	3,257,290	3,314,580
Independent Graduate	-	-	-	-	-	-	-	2,164	2,063	2,511
Graduate School	3,842	6,640	13,870	33,939	68,178	87,163	113,836	227,273	241,207	260,356
Tertiary Total	141,636	201,436	318,683	647,505	1,451,297	1,691,681	2,343,894	3,363,549	3,500,560	3,577,447

Source: Ministry of Education-KEDI, Statistical Yearbook of Education, various years

Table A3.1. Gross Enrolment Rates by School Level

(Unit: per cent)

	Kinder	Elementary	Middle	High	(Vocational High %)	Tertiary	Junior College (%)
53		59.6	21.1	12.4		3.1	
55		77.4	30.9	17.8		5.0	
60		86.2	33.3	19.9		6.4	
65	1.0	91.6	41.4	26.4	(40.4)	7.2	16.8
70	1.3	100.7	51.2	28.1	(46.6)	8.4	17.2
75	1.7	105	71.9	41.0	(42.3)	9.3	22.2
80	4.1	102.9	95.2	63.5	(45.0)	15.9	26.9
85	18.9	99.9	100.1	79.5	(41.2)	35.1	17.5
90	31.6	101.7	98.2	88.0	(35.5)	37.7	20.2
95	39.9	101.1	101.6	91.8	(42.2)	55.1	25.6
00	38.8	98.7	99.5	95.6	(36.1)	79.4	29.1
02	41.9	98.5	98.5	94.0	(32.0)	87.0	29.1

Note: the 1953-65 data are inconsistent with the data after 1965 and may be slightly upward biased

VH denotes vocational high school.

Source: 1953-65, McGuinne et al (1980), p47; 1970-02, KEDI, Educational Indicators of Korea. 2002

Table A3.2. Graduation and Advancement to Next Level of School

(Unit: per cent)

	Elementary School		Middle School		High School		
	Graduation rate	Advance to Middle	Graduation rate	Advance to HS	Graduation rate	Advance to Tertiary	To Univ .
1965		54.3		69.1		32.3	20.3
1970	86.1	66.1	93.6	70.1	93.0	26.9	24.5
1975	90.8	77.2	92.7	74.7	94.8	25.8	19.7
1980	94.1	95.8	97.0	84.5	94.4	27.2	24.8
1985	96.8	99.2	96.9	90.7	91.9	36.4	31.9
1990	98.7	99.8	97.6	95.7	94.1	33.2	26.2
1995	98.5	99.9	97.9	98.5	94.3	51.4	39.8
2000	99.2	99.9	97.9	99.5	93.6	70.5	41.1
2002	98.4	99.0	97.5	99.5	94.1	74.2	41.3

Note: Advancement rate = the number of the $i + 1^{\text{th}}$ stage entrants / the number of the i^{th} stage school graduates

Table A4. Patterns of Advancement to Higher Education by High School Type

(Unit: thousand persons, %)

Academic High School

	No of College Entrants	(Ratio to Total Graduates)	Junior college	Teachers College	University	Miscellaneous
1980	104.3	39.2	20.2	4.8	73.1	1.9
1985	196.8	53.8	26.9	1.7	69.7	1.7
1990	230.1	47.2	32.6	1.0	64.9	1.5
1995	284.2	72.9	26.6	1.4	71.1	0.9
2000	397.6	83.9	20.4	0.8	78.2	0.5
2001	397.2	85.3	21.1	0.9	77.2	0.8
2002	382.4	87.0	18.3	0.9	80.2	0.6

Vocational High Schools

	No of College Entrants	(Ratio to Total Graduates)	Junior colleges	Teachers College	University	Miscellaneous
1980	23.0	11.4	54.5	1.5	40.0	4.0
1985	36.9	13.3	66.1	0.6	32.1	1.3
1990	22.7	8.3	66.0	0.5	32.0	1.6
1995	49.7	19.2	66.5	0.6	32.1	0.7
2000	122.2	42.0	72.8	0.1	26.2	0.9
2001	121.4	44.9	72.7	0.1	26.4	0.8
2002	115.1	49.8	70.6	0.1	28.3	1.0

Source: Ministry of Education-KEDI, Statistical Yearbook of Education, various issues

Table A5. Sizes of higher education entrants and high school graduates

(Unit: thousands persons)

	Entry Quota (a)	Entry Quota (b)	HS Graduates (c)	a/c (%)	b/c (%)
1990	350.4	334.3	761.9	46.0	43.9
1995	505.8	476.1	649.7	77.9	73.3
2000	657.7	613.8	764.7	86.0	80.3
2001	658.7	614.1	736.2	89.5	83.4
2002	668.4	622.8	670.7	99.7	92.9
2003	670.0	622.8	625.4	107.1	99.6
2004	670.0	622.8	619.3	108.2	100.6
2005	670.0	622.8	597.2	112.2	104.3
2010	670.0	622.8	584.1	114.7	106.6

Note: (a) include all kinds of tertiary institutions; (b) exclude corporate technical colleges

The figures for 2003 onwards are projections.

Source: (b) Ministry of Education-KEDI, Statistical Yearbook of Education; (a) Ministry of Education, internal sources.

Table A6. High education enrolments and the youth cohorts

(Unit: persons, %)

	Cohort of the age 18-29 (A)	Cohort of the age 18-21(B)	Enrolments (c)	(C/A)	C/B
1970	6,073,205	2,217,953	201,436	3.3	9.1
1975	7,206,194(3.5)	2,994,594(6.2)	378,719(13.5)	5.3	12.6
1980	9,015,188(4.6)	3,631,634(3.9)	601,494(9.7)	6.7	16.6
1985	10,071,063(2.2)	3,394,665(-1.3)	1,277,825(16.3)	12.7	37.6
1990	10,516,514(0.9)	3,663,317(-1.5)	1,691,681(5.8)	16.1	46.2
1995	10,239,909(-0.5)	3,224,693(-2.5)	2,343,894(6.7)	22.9	72.7
2000	9,883,564(-0.7)	3,274,558(0.3)	3,363,549(7.5)	34.0	102.7
2001	9,750,938(-1.3)	3,270,212(-0.1)	3,500,560(0.8)	35.9	107.0
2002	9,558,209(-2.0)	3,170,465(-3.1)	3,577,447(0.8)	37.4	112.8

Source: Korea National Statistical Office, Population Projections for Korea, 2001.

Ministry of Education-KEDI, Statistical Yearbook of Education, various issues .

Table A7. Size of the unemployed or the idled students after gradation

(Unit: thousand persons, %)

	Junior College		University		Academic HS		Vocational HS	
	Graduates	Unemploy -ed / Idle	Graduates	Unemploy -ed / Idle	Graduates	Unemploy -ed / Idle	Graduates	Unemploy -ed / Idle
1980	51,507	17,641 (34.2)	49,735	10,502 (21.1)	266,331	135,921 (51.0)	201,057	73,732 (36.7)
1985	73,927	22,098 (29.9)	118,584	44,591 (37.6)	365,819	140,151 (38.3)	276,535	93,883 (33.9)
1990	87,131	18,479 (21.2)	165,916	65,329 (39.4)	487,772	208,017 (42.6)	274,150	39,925 (14.6)
1995	143,075	30,921 (21.6)	180,664	62,548 (34.6)	390,520	77,709 (19.9)	259,133	18,953 (7.3)
2000	223,489	41,563 (18.6)	214,498	81,902 (38.2)	473,665	63,934 (13.5)	291,047	18,811 (6.5)
2001	232,972	40,133 (17.2)	239,702	91,168 (38.0)	465,778	55,335 (11.9)	270,393	17,803 (6.6)
2002	239,114	41,490 (17.4)	244,852	83,775 (34.2)	439,586	46,613 (10.6)	231,127	11,539 (5.0)

Note: The figures in parenthesis indicate the percentage share of the 'unemployed/idle' in total graduates for each level of education

Source: Ministry of Education-KEDI, Statistical Yearbook of Education, various issues

Table A8.1. Expenditures of Higher Education Institution and Its Source in 1998

	GNP Share (%)	Public sources (%)	Private sources (%)	Private: of which subsidized (%)
OECD mean	1.33	77.3	22.7	4.8
Australia	1.59	56.1	43.9	12.0
Austria	1.46	98.9	1.1	-
Canada	1.85	56.6	43.4	26.1
Czech Republic	0.88	85.9	14.1	-
Denmark	1.53	97.2	2.8	-
France	1.13	85.5	14.5	4.2
Germany	1.04	92.1	7.9	-
Hungary	1.01	76.6	23.4	2.4
Iceland	1.78	97.7	2.3	-
Ireland	1.38	72.6	27.4	4.9
Italy	0.84	74.7	25.3	6.3
Japan	1.02	41.7	58.3	-
Korea	2.51	16.7	83.3	0.7
Mexico	0.89	87.9	12.1	-
Netherlands	1.18	87.5	12.5	9.0
Norway	1.51	94.0	6.0	-
Portugal	1.04	92.3	7.7	-
Spain	1.11	72.1	27.9	3.9
Sweden	1.67	89.3	10.7	-
Switzerland	1.11	98.5	1.5	1.5
Turkey	0.84	94.2	5.8	2.1
United Kingdom	1.11	62.7	37.3	12.4
United States	2.29	46.8	53.2	5.7
WEI participants				
Argentina	1.14	74.3	25.7	-
Chile	1.85	24.2	75.8	6.7
Indonesia ¹	0.58	43.6	56.4	-
Israel	2.18	59.4	40.6	6.5
Peru	1.32	44.6	55.4	-
Philippines ²	1.15	44.2	55.8	-
Thailand	2.58	32.5	67.5	-

Note: 1. Year of reference 1999; 2. Year of reference 1997.

Source: OECD (2001a), Tables B2.1b and B3.2

Table A8.2. Share of Private Financial Contributions by Level of School

(unit: per cent)

	Private sources				School expectancy
	Basic education		Tertiary education		Tertiary
	1995	1998	1995	1998	
Australia	13.8	15.9	27.7	31.9	3
Austria	3.9	5.2	2.4	1.1	2.2
Canada	6.3	8.3	40.9	17.3	2.8
Czech Republic	4.6	12.5	20.4	14.1	1.4
Denmark	2.2	2.1	-	2.8	2.5
France	5.1	4.9	10.7	10.3	2.6
Germany	24.5	24.1	7.3	7.9	2
Hungary	8.3	8	2.5	23	1.8
Iceland		-		2.3	2
Ireland	3.5	3.1	30.3	22.5	2.4
Italy	-	1	17.1	19	2.3
Japan	-	8.3	-	58	-
Korea	-	20.3	-	82.7	3.5
Mexico	13.2	13.8	22.6	12.1	0.9
Netherlands	6.1	2.7	1.5	3.5	2.3
Norway	1.1	0.9	6.4	6	3.1
Portugal	0	0.1	3.5	7.7	2.3
Spain	13.4	10.8	23.6	24	2.8
Sweden	-	0.2	-	10.7	2.9
Switzerland	-	10.6	-	1.5	1.7
Turkey	6	21.8	-0.8	3.7	1.2
OECD Mean	-	8.7	-	17.9	2.5

Note: In this table, private share indicates the share net of transfer from the government to the private sector.

Source: OECD (2001a), Tables B3.3 and C3.4.

Table A9. Trends of Share of Knowledge-Intensive Industries in Korea: 1985-1998

	Share in Gross Value-added				
	1985	1990	1995	1998	CAGR (90-98)
High-tech Manufactures	0.8	1.67	3.15	5.83	23.13
Mid-tech Manufactures	5.38	7.9	10.05	9.41	7.6
Knowledge-Intensive Services	14.44	16.54	19.35	20.97	8.45
Education and Health	15.81	12.7	10.1	9.8	1.9
Total 1	20.61	26.1	32.6	36.2	9.7
Total 2	36.42	38.8	42.6	46.0	7.5
	Share in Total Employment				
	1985	1990	1995	1998	CAGR (90-98)
High-tech Manufacturing	1.35	2.1	2.69	1.8	1.2
Mid-tech Manufacturing	6.45	8.3	7.8	5.9	4.0
Knowledge-intensive Services	5.48	7.0	10.3	10.5	58.5
Education and Health	4.83	5.51	6.56	9.6	7.5
Total 1	13.29	17.39	20.77	18.21	0.86
Total 2	18.12	22.9	27.33	27.82	2.75

Note: Total 1=HT+MHT+KIS, Total 2=KBI Total 1 + Education & Health

Source : Internal source KDI (calculated based on Korea's Input-Output Data processed by KIET)

Table A10. Trends in Wage Level by School Attainment (high school graduates = 100)
(unit : %)

Final Education Attained (Graduation)	1980	1985	1990	1995	2000
Middle School and Under	60.7	67.2	78.2	81.9	81.2
High School	100.0	100.0	100.0	100.0	100.0
Junior Colleges	156.4	139.0	123.3	114.2	110.4
University and Over	253.0	248.9	202.5	171.0	174.7

Note: The table only shows the wage difference among the new employees (experience not counted)

Source : Ministry of Labor, Basic Survey on Wages Structure, 2002

Table A11. Employment Distribution of College Graduates across Business Sectors
(unit: thousand persons, %)

Business	Agriculture & Fishery	Manufacturing	Utilities	Construction	Wholesale, Retailing, Restaurants, Hotel	Transport & Telecommunication	Finance, insurance, & business services	Social & Personal services	Total
Elementary school graduates and under									
1993	2,002(43.6)	798(17.4)	3(0.1)	382(8.3)	882(19.2)	102(2.2)	131(2.8)	289(6.3)	4,589(100)
1997	1,642(38.3)	686(16.0)	3(0.1)	379(8.8)	930(21.7)	109(2.5)	199(4.6)	344(8.0)	4,292(100)
2001	1,455(39.0)	532(14.2)	1(0.03)	239(6.4)	834(22.3)	106(2.8)	200(5.4)	367(9.8)	3,734(100)
Middle school graduates									
1993	443(13.5)	968(29.4)	5(0.1)	374(11.4)	917(27.9)	206(6.3)	125(3.8)	249(7.6)	3,286(100)
1997	392(11.1)	899(25.5)	4(0.1)	417(11.8)	1,085(30.7)	251(7.1)	174(4.9)	310(8.8)	3,533(100)
2001	332(11.0)	738(24.4)	2(0.1)	277(9.1)	924(30.5)	217(7.2)	179(5.9)	358(11.8)	3,027(100)
High school graduates									
1993	352(4.4)	2,282(28.3)	35(0.4)	710(8.8)	2,386(29.6)	555(6.9)	697(8.6)	1,047(13.0)	8,064(100)
1997	302(3.3)	2,210(24.5)	34(0.4)	906(10.0)	2,899(32.1)	623(6.9)	868(9.6)	1,182(13.1)	9,023(100)
2001	350(3.8)	2,094(22.5)	25(0.3)	739(8.0)	2,988(32.2)	731(7.9)	915(9.9)	1,446(15.6)	9,288(100)
Junior college graduates									
1993	16(1.9)	201(24.1)	3(0.4)	60(7.2)	196(23.5)	34(4.1)	73(8.7)	251(30.1)	834(100)
1997	16(1.1)	275(20.1)	9(0.7)	113(8.3)	326(23.8)	65(4.7)	185(13.6)	378(27.6)	1,366(100)
2001	15(0.9)	297(18.4)	11(0.7)	113(7.0)	387(23.9)	87(5.4)	269(16.6)	440(27.2)	1,619(100)
University graduates and over									
1993	37(1.4)	480(18.8)	19(0.7)	163(6.4)	471(18.4)	109(4.3)	336(13.1)	940(36.8)	2,555(100)
1997	34(1.2)	438(15.1)	26(0.9)	189(6.5)	565(19.6)	115(4.0)	473(16.4)	1,051(36.4)	2,892(100)
2001	41(1.1)	557(15.1)	17(0.5)	209(5.6)	687(18.6)	181(4.9)	681(18.4)	1,322(35.8)	3,694(100)
Total									
1993	2,849(14.7)	4,730(24.5)	65(0.3)	1,689(8.7)	4,852(25.1)	1,007(5.2)	1,361(7.0)	2,776(14.4)	19,328(100)
1997	2,385(11.3)	4,508(21.4)	77(0.4)	2,004(9.5)	5,805(27.5)	1,162(5.5)	1,900(9.0)	3,265(15.5)	21,106(100)
2001	2,193(10.3)	4,219(19.7)	56(0.3)	1,575(7.4)	5,820(27.2)	1,322(6.2)	2,244(10.5)	3,932(18.4)	21,362(100)

Source: Korean National Statistical Office, Annual Report on the Economically Active Population, various issues

Annex Figures

Figure A1. Enrollments trend at various levels of education in Korea

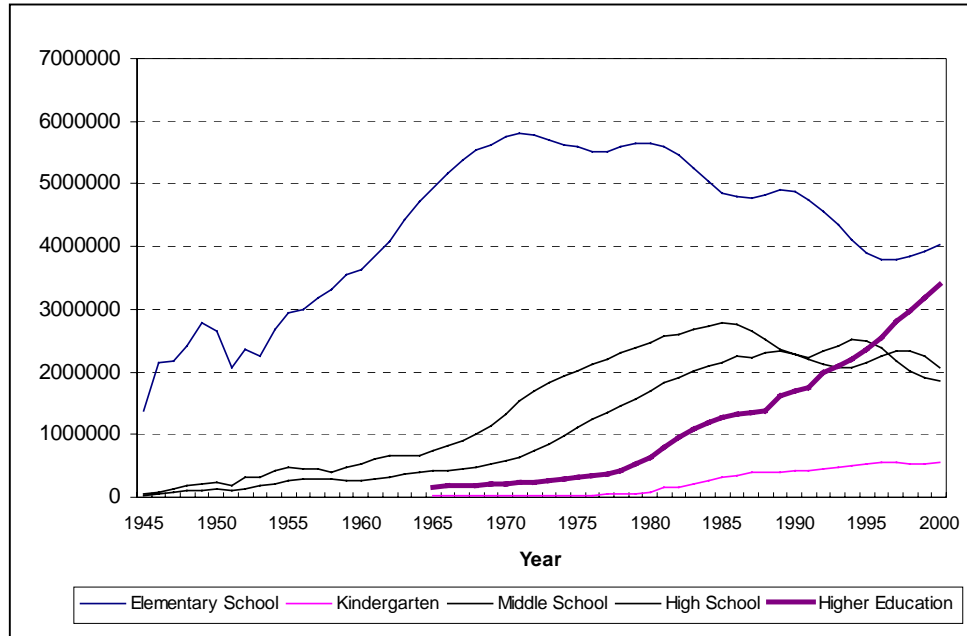


Figure A2. Enrolments Trend of Korean higher Education by School Type

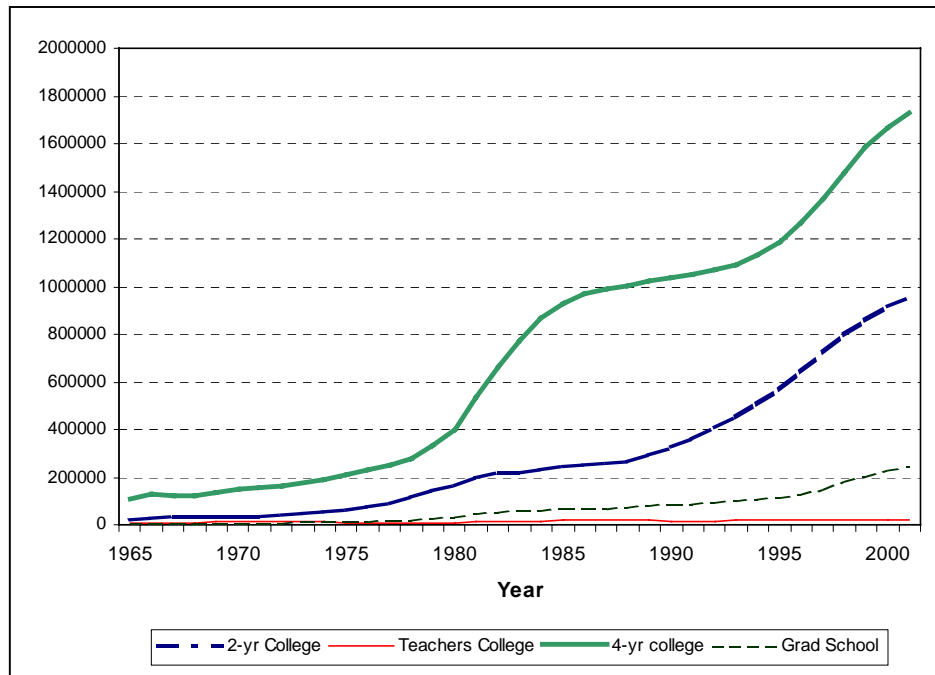
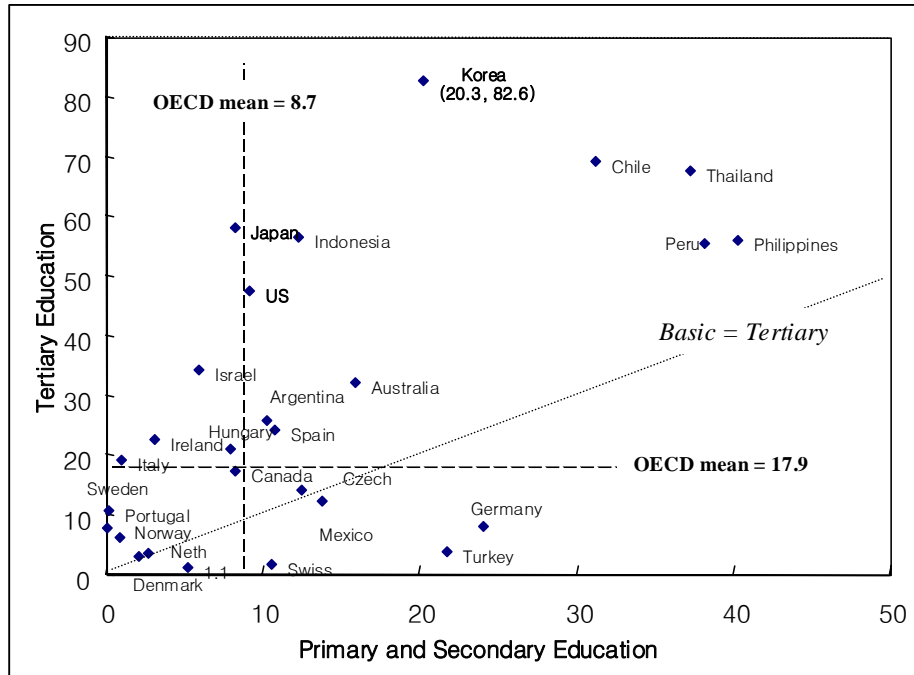


Figure A3. Share of Private Funding by level of School

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*(All references marked with * are in Korean)*