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Human Capital, Positional Good, or Social Network?: Exploring a Korean Model of Education

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Abstract

As part of an endeavor to explore interactions between education and economic growth in Korea, this paper attempts to explain the apparently puzzling finding that, during the past two decades, she has experienced an extraordinary growth in college enrollment rate in spite of a continuous fall in college wage premium. For this purpose, it focuses on school ties and dual labor market as constituent parts of socioeconomic mechanism underlying her economic growth. Drawing on the concepts of positional good, social network and social capital, it puts forward the conjecture that school ties which are built upon semi-permanent rankings of Korean universities have generated, on an extended scale, competition for entrance into top-ranked universities. At a more empirical level, this translates into the hypothesis that what is responsible for the unbridled demand for college education is not a difference in wages between college graduates and high school graduates, but a difference in wages between graduates from high-ranked universities and those from low-ranked universities. To test this hypothesis, it sets up two econometric models and obtains successful results: 1) that there exists a significant difference in wages between graduates from high-ranked universities and those from low-ranked universities; 2) that this difference becomes larger with an increase in their experience and career on the job.

1. Introduction

Studies on economic growth are prone to appreciate education as a key engine for economic growth due to its role in creating human capital or in saving transaction costs by means of

enhancing common language skill and social orientation (Lucas, 1988; Romer, 1990; Gradstein and Justman, 2002). Along this line, the rise of Korean model of economic growth has often been attributed to her high level of education (Amsden, 1992; Collins et al., 1996). The case of Korea also confirms the suggestion made by empirical literature on the linkage between education and economic growth (Barro, 1991; Krueger and Lindahl, 2001). It was found that years of schooling, both in terms of their level and their growth rate, were higher in Korea, compared to other developing countries.

In concrete terms, the ratio of those who completed primary education over the adult population in Korea was recorded at 26.2% in 1960, while that of East Asia, South Asia, Africa, and Latin America was known to be 17.7%, 5.2%, 8.5%, and 13.0%, respectively (Collins et al., 1996). Moreover, years of schooling in Korea grew at the highest rate in the world during 1960-1994. Average years of schooling for Koreans jumped from 3.2 % in 1960 to 9.7 % in 1994, which is very close to those for those of industrial countries (Collins et al., 1996). More surprisingly, Korea has achieved the second highest rate of college enrollment in the world, only next to Canada (OECD, 2010).

However, local academia, civil societies as well as policy makers have been unanimously concerned that the very fervor for education in Korea has turned into a major obstacle to her endeavor towards becoming a more mature society. Some stylized observations regarding the current educational system indicate: that it gives rise to cutthroat competition among students; that it puts too heavy strain on family budget; that it tend to foment favoritism towards well-educated people.

Almost every Korean student, from his or her primary and secondary school years on, is pressed to spend much time and efforts in preparing for college entrance examination.¹ The harsh competition for admissions into high-ranked colleges has induced Korean parents to spend a significant portion of their budgets on private tutoring for their children. In 2007, 2.3% of the entire GDP of Korea was apportioned to private tutoring, which amounts to 74% of total public

¹ In addition, about 20% of high school graduates in Korea have spent one or even two more years to retake the high-stake test which is given once a year, in the hope that they enter a better-ranked university.

expenditure on primary and secondary education (KSA, 2010; OECD 2010).² Moreover, Korea has ranked highest among OECD countries in terms of the proportions of private expenditure on tertiary education.³

Given her fervor for education, it is natural that Korea has registered an extraordinary growth in college enrollment rate during the past two decades. However, it is also true that during the same period she has experienced a significant fall in wage premium of college graduates. Looked at from the viewpoint of traditional labor economics, it is puzzling that she has undergone an unusual growth in college enrollment rate and a fall in college wage premium, at the same time.

In order to unravel the puzzle about her educational system, attention should be brought to the significant role of a unique structure of competition and formation of social ties in Korea. From the early stage of her economic growth onwards, Korean educational system has played the pivotal role of allocating a limited number of decent jobs on the basis of semi-permanent rankings of universities from which employees graduate. The existence of semi-permanent rankings of universities and the fierce competition for entrance into top-ranked universities have helped to generate clans of alumni on the basis of their universities from which they came.

This paper intends to uncover a socio-economic mechanism that may account for the coexistence of an extraordinary growth in college enrollment rate and a fall in wage premium during the past two decades. For this purpose, this paper is organized as follows. In the subsequent section, a brief outline of institutional background of the Korean education is offered. In the third section, relevant theories are reviewed with the focus on their merits and shortcomings in explaining the aforementioned puzzle. This review produces the conjecture that, due to specific school ties which built on rankings of Korean universities, many privileges accrue to graduates from the highly ranked colleges, but nearly none to graduates from low-ranked colleges. In the fourth section, two empirical hypotheses into which this conjecture is translated

² In the same year, public expenditure on primary and secondary education in Korea amounts to 3.1% of the total GDP, which is close to 3.3% in OECD countries (OECD, 2008).

³ In 2005, private expenditure on tertiary education in Korea accounts for 1.8% of GDP, while the average of those in OECD countries is registered at 0.4% of GDP. In the same year, the sum of public and private expenditure on tertiary education in Korea as a ratio of GDP is recorded at 2.4%, which is much higher than 1.5% in OECD countries.

are tested and their results are reported. In the last section, implications are drawn from this inquiry.

2. Institutional background

Modern educational system is an integral part of a capitalist society. This system is embedded in various institutions which include rules governing the ways and procedures whereby resources involved in education services are allocated. As educational institutions tend to evolve with industrialization in a country, they are likely to be shaped by the process of industrialization in general, and by the role of education in assigning jobs in the labor market in particular.

Moreover, according to sociological literature on the relation between levels of educational achievement and occupational positions, educational system differs from one industrial country to another in: the depth of educational stratifications; the extent of standardization; the relative weight of general and vocational credentials (Kerckhoff, 2000).

The current educational system of Korea is featured by a low degree of stratification into different curricular and status tracks, which is closer to the US system than are those of most Western European countries. Most credentials awarded by secondary schools and even some awarded by colleges in Korea are general rather than vocational, which is also similar to the US system.

However, the Korean educational system parallels most European systems in its high degree of standardization and government regulations. More specifically, the Korean government has imposed on schools for tertiary education a set of strict regulations with respect to establishment of institutes and departments, enrollment quotas, student admission procedures, and even tuitions (Kim and Lee, 2006).

In order to understand interactions and interdependences between educational system, government and social economy in Korea, it is useful to outline her modern history. This may be traced back to the Japanese colonial period which started from 1910 and ended at 1945. It is during this period that modern educational institutions have been introduced into Korea by the Japanese imperialist authorities. During this period, the Japanese authorities opened up

elementary and secondary public schools with the obvious intention to solidify their colonial occupation,⁴ and to carry out industrialization policies in accordance with their own interests.

One feature that deserves mention is that the Japanese authorities intrigued Korean ordinary people into attending the schools by adding credits to applicants for government-related jobs, if they completed modern education. This stimulated Koreans' demand for modern education. As of 1945, 65% and 20% of the school-aged children were enrolled at elementary and secondary schools, respectively (Kim and Lee, 2010).

After the liberation from the Japanese colonial rule, the Korean government placed top priority on prompt establishment of public education system as an effort to initiate economic development (McGinn et al, 1980). During the period of the 1950s-1970s, the government incessantly constructed primary and secondary school classrooms and created colleges to produce and train school teachers. As primary and secondary education services were financed largely out of public expenditure, they were available on an equal basis to a wide range of ordinary people.

More fundamental than the supply side of the story is its demand side. In fact, these government policies to expand these educational services were largely driven by growing demand for the services. The growing demand could be explained differently, depending on the phases of economic development.

Koreans had a strong desire to take the advantage of the opportunities made available by the elimination of the pre-modern landlord class. This was completed by the land reform in 1950 and the subsequent Korean civil war during 1950-1953. These two important events contributed not only to an increase in migration of people from rural into urban area, but also to an increase in mobility from lower class to middle or higher class.

Given the significant change in social structure including class structure, investment in education for their children became an increasingly attractive option for Korean parents as a way to improve social statuses and income levels of their entire families. This expectation on the part

⁴ The Japanese authorities highlighted integration of Korea into Japan throughout the curriculum and employed Japanese teachers to implement the mental colonization of Korea. As of 1945, right before Korea's liberation from the Japanese colonial rule, Japanese teachers accounted for 40% of the primary school teachers and for 70% of the secondary school teachers (Kim and Lee, 2010).

of parents boosted demand for education for their children. Table 1 shows the rapidly growing rates of enrollment in the primary school soon after the Korean war and those in the middle school during the late 1960s and 1970s.

Table 1 about here

By comparison, the rapid increase in high school enrollment during the 1970s and 1980s and in college enrollment during the 1980s and the 1990s as indicated by Table 1 seems to have to do not merely with educational system per se but with socioeconomic system. The reason is that, in this later era of economic growth, educational system was more integrated into socioeconomic system. To elucidate, it is necessary to elaborate on interrelationships between the two systems.

On the side of socioeconomic system, the rising demand for educational service relates more to the specificity of Korean industrialization and, in particular, to the specific way in which a limited number of decent jobs are allocated in the Korean labor market. It is widely known that industrialization of Korea was driven by powerful and extensive government initiatives and interventions in mobilizing and allocating resources. Moreover, it was featured by highly concentrated industry structure which is dominated by *Chaebol*, i.e., business groups diversified into unrelated fields (Amsden, 1992). The developmental dictatorship has contributed to the birth and growth of *Chaebol* by allocating a disproportionately large amount of resources to it.

As most industries in Korea have been dominated by a small number of big firms and a large number of small firms, her labor market has been, correspondingly, segmented into two. The big firms, mostly affiliates of *Chaebol*, with a large amount of financial assistance from the government, could become competitive not only in domestic markets but also in international markets. As a consequence, compensations including wages were significantly higher for employees of big firms than for those of small firms. This increasingly motivated the Korean people to seek for jobs in the big firms.

It is widely agreed that the way better-paid jobs are distributed in a society has a significant impact on behaviors and decisions on the part of its agents with respect to their efforts, talents and their physical resources (Murphy, et al., 1991; Acemoglu, 1995; Rosenbaum, 1986). Most good jobs in Korea were offered by *Chaebol*, financial intermediaries, public enterprises, and government. Moreover, almost all of the white-collar jobs in those fields have been assigned on

the basis of their academic backgrounds. This has become a social rule or institution immediately after her independence from the Japanese colonialism.

Now going back to the side of educational system, it is crucial to point out that academic backgrounds in Korea stand for the semi-permanent rankings of universities which are determined by the level of scores acquired by students admitted into each university in nationwide tests.

First, universities in Korea have been ranked in a monotonic way and their rankings have been rarely changed for decades. For this reason, all the students equally have strong preference for high-ranked universities. This implies that competition among high school students for college entrance boils down to a contest for admissions into those universities.

Second, students should take a nationwide test and obtain scores on a uniform scale in order to get admitted into a university. If a student applies for admission into a department of a university, he/she is compared with other applicants simply in terms of this score. Moreover, the government permits each university to accommodate a given number of students. And each university divides this number in predetermined proportions to its schools and its departments. Given this quota, a specific department of each university finds the cutoff point for this tournament by means of ranking its applicants simply on the basis of this score.

It turns out that Korean students have been admitted into differently ranked universities by the order or rank in which they are positioned in terms of their performance in nationwide tests. Moreover, rankings of the universities have been determined and measured largely by the average score of freshmen who are admitted into each university. It is to be noted that rankings on the basis of the scores of the students have little to do with the quality of educational services that the universities offer.

It comes as no surprise that this procedure of selection on the basis of nationwide tests requires a huge amount of monitoring costs. Moreover, admission procedures have been tightly regulated by the government. Still this has been widely acclaimed for decades by ordinary Koreans as an objective

way of screening.⁵ Especially, as is very often the case in other fields of the Korean society, regulation by the government in this field has been taken, by Koreans, more as evidence of reliability of the procedures than as evidence of their conformity or uniformity. For this reason, all the universities have relied on the scores of nationwide entrance examination for selection among their applicants.

Once students pass the gates of the universities (a figurative way of describing their admission in Korea), most of them tend to graduate from the universities with little difficulty. This is inseparably intertwined with the fact that there is little mobility of students between universities of differently ranks, once they are admitted. The only way to switch from one university to another is to undergo the pains of retaking the examination and achieving higher marks.

The foregoing elaboration shows that there is a persistent hierarchy among universities in Korea and that it is determined and reproduced by scores which students being admitted into each university recorded in nationwide tests. Perhaps for these reasons, college graduates have been prone to form a clan or a group exclusively made up of alumni under the banner of each university of a certain rank. This lays the groundwork for a specific type of school ties called *Hakbol*. As a result, a Korean is likely to be classified as a member of a specific group by the ranking of his/her *Alma Mater*.

Moreover, graduates from high-ranked universities were provided and nearly ensured with better-paid jobs in privileged workplaces until their retirement. This means fairly low mobility in labor market as well. Therefore, the process of allocating good jobs in Korea was doomed to be a sort of one-shot game with the high-stake entrance examination and with little room for reversibility in the future.

The established rule by which limited slots of better paid and more stable jobs are allocated on the basis of *Hakbol* implanted into the minds of Korean parents the belief that educational services must be the best way to help their children to get on in the world. In other terms, the socioeconomic entity of *Hakbol* has been a strong signal for Koreans to invest in the education of their children. Thus the semi-permanent rank structure of universities has been reproduced, on

⁵ Part of the reason would be that evaluation of performance on objective, albeit rigid, criteria is regarded as the only effective way to preclude favoritism in the Korean society which is presumably characterized by lack of customs for contract on an individual basis and by relatively low level of trust.

the extended scale, along with competition on the part of students for admissions into highly ranked universities during the past several decades.

On the other hand, industrialization which has been taking place since the late 1960's has brought into being dual labor market amidst expansion of the domestic market. This is largely due to her features of *dirigisme* and favoritism to *Chaebol*. The existence of the upper tier labor market, combined with the semi-permanent rankings of universities, has magnified competition for entrance into prestigious universities.

There is another historical process which brought about the intended consequence of aggravating the situation by shifting competition from several levels of education entirely onto the entrance level of universities. Korea used to have entrance examination nearly at every level of her educational system. Competition for middle schools (grades 7-9) became intense due to the rise in enrollment at middle schools during the 60's and 70's, which coincided with the early stage of the Korean industrialization.

Having recognized the downsides of such fierce competition, the Korean government introduced school equalization policy during the period of 1969-1971. This policy aimed to replace competitive entrance examination for middle schools with random allocation of students to public or private schools in the district by lottery. Students were allowed to take part in the lottery on the condition that they passed a nation-wide qualification examination (Kim and Lee, 2010).

However, people responded to the policy by focusing on entrance examinations for high schools (grades 10-12), now that there was no more competition at the entrance level of middle schools. In reaction, the Government expanded the equalization policy to the level of high schools. The equalization policy at the level of high school was implemented first in Seoul and Pusan, the two largest cities in Korea in 1974. Then it was gradually extended into other major cities up to the year of 1980. Around this time, enrollment rate for high school jumped from 28.1 percent in 1970 to 48.8 percent in 1980 (See Table 1).

The equalization policies on the part of the government eliminated competition for highly ranked secondary schools but did not succeed in quenching their thirst for educational credentials themselves. Instead, competition in the field of education has shifted from the level of secondary

schools to the entrance level of colleges during the 1980s. And this competition for college became nearly explosive in 1990s.

This corroborates our main argument that the increasing demand for the sheepskin of highly ranked colleges has been generated by the way that decent jobs are allocated. Moreover, dual industry structure and dual labor market have persisted in the 70's and 80's due to the path dependence of socio-economic policies adopted in the early stage of industrialization. At the same time, *de jure* government intervention into the economy has been slackened, since financial crisis broke out and IMF rescue program was imposed in 1997. In this environment, competition for college entrance, private tutoring and formation of school ties have been more out of control and have been allowed to be reproduced in interaction and on an extended scale. All this reinforced the role of college credentials in distributing well-paid jobs.

A study on the issue indicates that, as of 2004, the alumni of the top three among the 190 universities in Korea accounted for 40% of the senior managers of the corporations listed in Korea Stock Exchange or KOSDAQ. Moreover, from the same three universities came 64% of the senior officers of the government and 57% of the incumbent congressmen (Chae et al., 2005).⁶

The intense competition for *Hakbol* brought about two immediate consequences: distortion and degeneration of official secondary education and proliferation of private tutoring. As competition for better education credentials has turned into a contest for highly ranked colleges, parents, teachers and students all have become preoccupied with college entrance examination. For the same reason, curricula in secondary schools have been geared entirely towards the entrance examination.

At the same time, private tutoring, owing to its function of assisting students in enhancing their skills for the examination, has mushroomed during the 1990's and the 2000's. In 2007, 75% of middle school students and 62% of high school students purchased private tutoring (Jones and Tsutsumi, 2009). Moreover, household spending on private tutoring as a percentage of GDP has increased from 0.5% in 1985 to 1.9% in 1995 and to 2.8% in 2005 (Kim and Lee, 2010).

⁶ See Yoo and Lee (2009), for a similar work, which makes comparison between elite networks of France and those of Korea. See also Hartmann (2000), for the contrast between France and Germany in terms of social reproduction of business elites.

Intensified competition for college *Hakbol* is also evidenced by a remarkable increase in the number of students entering colleges since 1980s. Enrollment rate of 2-year and 4-year colleges jumped, initially from 11.4% in 1980 to 23.6% in 1990, then to 52.5% in 2000, and finally to 70.1% in 2010 (see Table 1). As a consequence, Korea recorded the second highest attainment rate of tertiary education for people aged at 25-34 among OECD countries (see Table 2).

Even if Korea achieved significant growth of per capita GDP during this period (see Table 1), most households have suffered from mounting expenditure on college education for their children. This is partly explained by the fact that the excessive demand for college education has been largely met by services supplied by private colleges during 1990s (Kim and Lee, 2006).

Of more significance for our purpose, the speedy increase in the supply of college graduates has driven college wage premium downwards. Average wage differentials between college and high school graduates after controlling for age and experience have been falling since the late 1980s (Jang 2002; Choi and Jeong, 2003). However, demand for college education has been growing unchecked. The reason, to repeat, is that the high-stake competition for a limited number of lucrative job opportunities has been governed largely by college entrance examination, for which parents have invested a significant amount of money in preparing their children's skills.

Table 2 about here

3. Theoretical background

The previous section has focused on uncovering the institutional background in which Koreans' unbridled demand for education is embedded. This section is devoted to reviewing relevant theories for the purpose of conceptualizing this anomalous demand. Most theories in the field of labor economics tend to explain demand for college education by college wage premium, although they differ from each other in the sources of the premium.

The well-known human capital theory argues that expenditure on college education is a kind of investment in the sense that it enhances prospective workers' productivity and rewards them with wage differentials (Becker, 1975). By comparison, market signaling theory, assuming information asymmetry, claims that a college sheepskin serves as a mechanism for workers to sort on unobserved ability (Spence, 1973; Weiss, 1995). Employers then use differences in the

average abilities between college graduates and high school graduates to determine wage differentials.

Since the two theories equally assume that individuals choose such a length of schooling that equates its marginal return to its marginal cost, they share the prediction that a decrease in college wage premium leads to a decline in demand for college education. However, their prediction does not seem to fit in with Koreans' demand for college education described in the previous section.

The limited explanatory power of the two theories for the Korean case is ascribable to their belief in methodological individualism. Due their methodological position, they focus neither on institutional background of education and social structure which shapes the distinctive role of education for a specific society. In broad outline, the institutional and historical backgrounds of human behaviors are ignored in the two typical theories of traditional labor economics.

This paper relies on three theories in the fields of economics and sociology for the purpose of clarifying this phenomenal demand for educational service. It adopts the concept of 'positional arms race' from the theory of positional goods (Frank, 1984, 1985; Frank and Cook, 1995). Moreover, it relies on the ideas of social network and social capital (Lin, 1982, 1999a, 1999b; Bourdieu, 1980, 1986).

First of all, it is common knowledge in Korea that Koreans are sensitive to relative positions and rankings among members in most of their social organizations such as schools and firms. This motivates us to take Frank's concept of positional goods into consideration. Frank argued that, in recent decades, a top-ranked winner has taken the increasing proportions of the total prize in the contests in various fields of the American society (Frank & Cook, 1995). In his account, globalization, as it has widened the scope of competition, has intensified these contests.

As a result, people are, allegedly, prone to be classified into different ranks or positions or, more discretely, into winners or losers. For the same reason, a small difference in performance has allegedly translated into a larger difference in reward, which has aggravated inequality in income distribution. This situation has drawn more and more people into the whirlpool of contests for the highest rank or position, although they know that their chances to win the highest rank or position are very low.

On his view, it is most crucial to take note that these contests entail a kind of arms race owing to the fact that rankings and positions are purely relative. That is, a contestant can expect higher position in the market by spending more money on advertisement or education, only if the other contestants refrain from doing the same. Still, each contestant, faced with a prisoner's dilemma, cannot but adopt the dominant strategy of making more expenditure. As this type of contest has resulted in an escalating amount of expenditure with little contribution towards the overall productivity or performance, the society, he claims, has suffered from social waste and inefficient distribution of resources.

Frank's idea, however, needs some revision in order to be applied to the Korean society. First, in his account, positions and rankings seems to be derived from wage levels.⁷ By contrast, in the Korean society, positions and rankings are reducible neither to wages nor to utility, whether they are conceived in absolute or relative terms. Instead, positions and rankings tend to function, independently of, and prior to, wages.

To be reminded, one crucial determinant of social positions and statuses of many Koreans must be the rankings of the universities from which they graduated. This has the implication that, in the Korean society, causality may run from independently formed positions and rankings to wage levels rather than the other way around. That is, higher (lower) positions bring about higher (lower) wages rather than higher (lower) wages bring about higher (lower) positions.⁸

More important, Frank conceptualized positional goods at the individual level. This does not harmonize with the aforementioned fact that social positions in Korea are very often dependent on clans of university alumni. More specifically, he rarely mentioned a collectivity composed of social relationships which may stand behind university graduates, although he was aware of informational networks among high-ranked university graduates.⁹

⁷ In line with Festinger's idea of social comparison, Frank argued that people obtain utility not only from their absolute level of income or goods, but also from their relative incomes, i.e., their incomes compared to others' (Festinger, 1954; Frank, 1984, 1997, 2005).

⁸ Moreover, a college graduate is provided with more chances or options in marriage. It must be true to say that levels of education are more influential in determining the set of matching options for Koreans than for Americans or Europeans.

⁹ Frank made another related argument that educational service, houses or cars are more observable than are medical insurance or recreation and that more of observables and less of unobservables are likely to be demanded than is required by social optimality (Frank, 1985). This argument seems to presuppose too

Social network theory and social capital theory provide a valuable building block for the explanation of the Korean case. Social network theory suggests that people form various social relationships and pursue their interests by means of resources embedded in these relationships.¹⁰ Their interests could be economic wealth, political power or cultural status (Glanville & Bienenstock, 2009; Moody & Paxton, 2009).

School ties are usually identified as a kind of social network (Emirbayer & Goodwin, 1994). But most advocates of this theory are prone to lay emphasis on the effects of social network on an individual, although some of its advocates concede that social networks function at the level of groups as well (Lin, 1999). By contrast, in Korea, school ties called *Hakbol* constitute social networks which function more at the collective level than at the individual level. It is to be reminded that this specific type of school ties is very likely to result in clans of alumni. Moreover, they take the form of alumni associations which make arrangements for regular events to promote common interests of their members.

The existence of clans of alumni in Korea gives each student access to school ties, automatically upon his/her admission into, or, at the latest, upon his/her graduation from, a specific university. A student of a specific university, upon his/her graduation, is, all at once, provided with a number of potential relationships with a number of unknown alumni with no choice of his/her own.

This has the implication that, for Koreans, choosing a specific university is nearly equivalent to choosing a bunch of social relationships. School ties so created are likely to be so wide-ranging that they are available to graduates of a high-ranked university not merely within a specific field of the society but across its various fields such as government, business, academia and mass media.

much irrationality on the part of students and their parents, as it is tantamount to alleging that they spend such an amount of money and time on educational service for the mere purpose of showing off.

¹⁰ Lin laid stress on social relations for social capital theory and at the same time traced this theory back to Marx's concept of capital and surplus value. However, he seemed unaware of Marx's reliance on social relations such as exchange relations and exploitation relations for his theory of (surplus) value and capital (Lin, 1999). Moreover, there are other strands of thought such as Aristotle and a number of cultural psychologists (Markus & Kitayama, 1991, 2010) who highlighted human relations or social relations as the basis of socioeconomic analysis.

This collective and comprehensive nature of *Hakbol* can be better clarified by social capital theory. Bourdieu (1980) conceptualized social capital as resources which give advantages to college graduates due to their social relationships and their membership in a group. Agents benefit from social capital more as a collective resource than as a private resource.

As social capital is conceptualized as networks and relationships among alumni and as membership in groups, educational qualifications such as diplomas/certificates or degrees/titles could be understood as forms of social capital. Moreover, money, power and status which accrue to their holders could be treated as forms of income or revenue from social capital. Whereas social capital itself or its source is relational, collective or structural, forms of social capital and forms of revenue which derive from the capital must be concrete and individualized.¹¹

This holds true of the specific type of school ties called *Hakbol*. *Hakbol* appears to be a property of an individual, although it is a social and structural phenomenon. *Hakbol* as a property of an individual stands for the form of social capital, whereas *Hakbol* as a social phenomenon represents the concept of social capital itself or its source. This seems to be expressed by Koreans' common saying that such and such a person has a good (or a bad) *Hakbol*.

One should take note of the possibility that graduates of highly ranked universities might not have appropriated entirely to themselves the surplus derived from the school ties. Instead, they may have shared it with organizations, especially with firms where they have been employed. Firms might have drawn on school ties of their employees for making more profits or for improving their chances for survival.

In this context, take note of the fact that most graduates of highly ranked universities have been employed by big firms or *Chaebol*. Given this fact, the foregoing implies that *Hakbol* may be responsible for profit differentials among firms, in particular between big firms and small firms. A step further, *Chaebol* may have thrived, at least partly, on *Hakbol* during the period of Korean economic growth. It deserves mention, in this regard, that, in Korean, the term *Hakbol* shares the second character with the term *Chaebol*.¹² It follows that school ties generate not

¹¹ In this regard market signaling theory could be reinterpreted in a way more consistent with the role of school ties. It can be understood as the view that a diploma of an individual signals a bunch of social relationships or a collectivity which stand behind him/her, instead of his/her unobservable ability.

¹² *Hakbol* (學閥) and *Chaebol* (財閥) share the characteristic of a group or a conglomerate and have the commonality of relying on interdependence of its members. In fact the so-called "unrelated

merely wage differentials among groups of college graduates, but also profit differentials among firms.

It is worth noting that social capital has its own negative aspects. Major consequences of negative social capital could be 'exclusion of outsiders, excess claims on group members, restrictions on individual freedom, and downward leveling norms' (Portes, 1998, pp. 15-18). Most of these, especially exclusion of outsiders and downward leveling norms, are true of the Korean school ties as well.

To take stock, the foregoing exploration suggests that neither human capital theory nor market signaling theory is capable of explicating the Korean people's educational fever. Although Frank's account has the advantage of highlighting the role of positions and ranks in the Korean educational and labor markets, it has its own drawback of ignoring the significance of social relationships and groups. Social network theory is credited with addressing the issue of social relationships, but it is too individualistic to handle groups or collectivity. All told, Bourdieu's version of social capital theory goes furthest towards explaining the peculiar type of school ties in Korea, especially if it is supplemented with Frank's emphasis on positions and ranks.

More specifically, *Hakbol* as a peculiar type of school ties among alumni can be conceived, most properly, as social capital which is embedded in social relations and groups rather than they are created by individuals' rational choices.¹³ The existence of school ties gives rise to differences between groups of graduates of differently ranked universities in terms of money, power and status. Besides, school ties by groups might have contributed to profit differentials between big firms and small firms.

In the Korean society, as feudal landlord system has been eliminated during the late 1940s and the early 1950s, social positions have become open to ordinary people. This has paved the way towards the allocation of good positions on the basis of relative rankings in educational

diversification" of *Chaebol* which stands for investment across unrelated industries goes well with the feature of *Hakbol* in that it functions across various social domains. However, there is a major difference between the two with respect to units of agency. *Hakbol* is embedded in human or social relationships among humans, whereas *Chaebol* is built on interlocking or interdependence, horizontal or vertical, between firms which have their own internal structures.

¹³ This evaluation is consonant with the interdependence of human beings or the predominance of social relations and groups in East Asia, as is endorsed by a number of prominent cultural psychologists (Hofstede & Crae, 2004; Markus & Kitayama, 1991, 2010).

credentials. In addition, the salient feature of the *dirigiste* tradition has molded the Korean society in such a way that access to social networks across the fields of politics, government, and business is indispensable for one's career. In recent years, this elite network has been formed largely by *Hakbol*.

Given the mechanism for allocating well-paid jobs in Korea, it is natural for people to realize that the life-long cost of ignoring the high-stake and one-shot contest for obtaining *Hakbol* is not trivial. Due to the irreversible high-stake involved in this contest, Koreans are not ready to forgo college education. The net outcome is unbridled competition for entrance into high-ranked universities, even in the face of the oversupply of college graduates and the ensuing decrease in college wage premium.

4. Empirical analysis

4.1 Empirical model

Based on the foregoing exploration, we have come up with two testable hypotheses.

Hypothesis 1: Wage premium of four-year colleges relative to two-year colleges or high schools is substantial for graduates from high-ranked four-year colleges, whereas it is minimal for those from low-ranked four-year colleges.

Hypothesis 2: Wage premium of high-ranked four-year college graduates grows as their job experiences accumulate, since school ties tend to become more important at higher job ladders in the Korean society.

Coming down to the task of empirical inquiry, two reservations are in order. First, our inquiry has yet to come up with ideas to segregate the effects of *Hakbol* on the group level from those on the individual level. Thus, at this stage, there is little point of distinguishing social capital theory from social network theory. Put another way, our empirical investigation expects the two theories to produce observationally equivalent results. Moreover, although it has been pointed out that social network or social capital translate not only into wages but also into power and status, this empirical inquiry focuses on wages.

To test our two hypotheses empirically, two econometric models are set up using the Mincerian wage equation (Mincer, 1974; Card, 1999), along the lines of most studies in labor economics (Krueger and Lindahl, 2001). Since the models focus on the effects of *Hakbol* on labor market, wages in particular, their key feature is how to specify a variable for elite networks or social relationships which originate from *Hakbol*.

Hakbol is represented by the rankings of colleges from which workers graduated. In Korea, rankings among four-year colleges are commonly measured by average scores recorded by incoming students in nationwide entrance exams. It is noteworthy that they have rarely changed for decades (Kim, 2006). In particular, there has been little change in the rankings of top ten universities among the 179 four-year colleges.¹⁴ Rankings on the basis of these scores could be taken as a measure of elite networks.

Besides social networks, there could be other factors that might have contributed to their higher wages. In consideration of this possibility, the model adopts workers' cognitive ability as a variable to control for the potential bias of ability. Lastly, it includes other individual characteristics, such as age, gender, education duration, and job experience. Putting them together, the model to test the first hypothesis is specified as follows:

$$1) \quad \ln W_{it} = \alpha + \beta H_{it} + \delta I_{it} + \gamma E_{it} + \varepsilon_{it}$$

The logarithm of worker *i*'s hourly earnings ($\ln W_i$) at the year *t* is regressed on contribution of education to the individual's human capital (H_{it}), his/her individual characteristics (I_{it}), and elite network to which he/she is affiliated (E_{it}). ΔH_{it} is measured by the number of years that the worker spent in completing his/her education (EDUYEAR). A worker's cognitive ability is measured by the score of College Scholastic Ability Test (CSAT).

The network variable is identified by whether or not a worker graduated from one of the top ten universities. This identification requires classifying all the colleges into four categories: top ten four-year colleges, four-year colleges of 11th to 30th rank, the other four-year colleges, and two-year colleges. Three dummy variables are used for the first three categories, and specified

¹⁴ The number of four-year colleges increased from 85 in 1980 to 107 in 1990, then, to 161 in 2000, and, further, to 179 in 2010.

into coefficients ($\gamma_1, \gamma_2, \gamma_3$). Thus, two-year college variable serves as a benchmark in the model.

Initially we intended to set up a fixed effect panel regression model in order to control for other unobserved individual-specific factors. However, due to data limitation which will be explained later, we adopt a pooling Ordinary Least Square method using an unbalanced panel data set.

Based on regression model estimation, it is expected that marginal contribution of elite college network to wage (γ_1) would be positive and statistically significant. On the other hand, network effects of other two college groups whose rankings range from 11th to 30th (γ_2), and from 31st to bottom (γ_3) on wage are expected to be statistically insignificant. In other words, there would be a systematic wage premium effect of elite college graduates even after controlling for workers' cognitive ability, educational level, job experience, age and gender.

However, advocates of market signaling theory would insist that wage premium effect of elite college graduates (γ_1) comes from other unobserved characteristics, such as perseverance (Weiss, 1995), rather than from elite network. They would claim that the sheepskin of elite college graduates may signal employers that they will work harder than do non-elite college graduates. Thus they hold the expectation that although wage premium of elite college relative to non-elite college must be great at the initial stage of employment, it must decline as college graduates become more experienced and skilled in the labor market (Arcidiacono, et al., 2010).

This interpretation of γ_1 offered by market signaling theory motivates us to put forward the second hypothesis of this. In order to test the second hypothesis another model is set up as follows.

$$(2) \quad \Delta W_{it} = \beta_0 + \beta_1 GENDER_{it} + \beta_2 JOBEXP_{it} + \beta_3 JOBEXP_{it}^2 + \beta_4 EDUYEAR_{it} + \beta_5 CRD1_{it} * JOBEXP_{it} + \beta_6 CRD2_{it} * JOBEXP_{it} + \beta_7 CRD3_{it} * JOBEXP_{it} + \beta_8 2YCOLD_{it} * JOBEXP_{it} + \varepsilon_{it}$$

In this model, ΔW_{it} stands for changes in hourly wage in real terms. They are measured by the wage differences of three periods: between 1999 and 2002, between 2002 and 2005, and between 2005 and 2008. The baseline of the dummy regression model is changes in real hourly wage of high school graduates. Effects which interactions between elite college graduation and job

experience have on changes in wage are estimated by β_5 , which is our focal coefficient. Subsequent coefficients (β_6 , β_7 , β_8) are supposed to capture the effects of interactions between non-elite four year college plus two-year college degrees and job experience on wage increases.

Due to data limitations which shall be mentioned below, we do not control for individuals' cognitive ability, but we employ a pooling Ordinary Least Square method to estimate the model using an unbalanced panel data set of 10-year time span from 1999 to 2008.

The coefficient of β_5 means the second derivative of real hourly wage with respect to job experience, $\frac{\partial^2 W}{\partial JOBEXP}$. Thus, the sign of the coefficient would tell us whether effects of elite college diplomas on wage increases accelerate or decelerate as employees get more experienced on the job. This model has the expectation that effects of elite college sheepskins on growth of real hourly wage would increase as they get more experienced, whereas those of non-elite college sheepskins would not be statistically significant. As discussed in the previous section, this expectation is based on the characteristics of the Korean society such as dual labor market and elite networks across *Chaebol*, government, and political groups.

1.1 Data

Two data sets are used for estimating the econometric models. First, we use a South Korean national household survey titled "Korean Labor and Income Panel Study" (or KLIPS). The KLIPS is a longitudinal survey administered by the Korea Labor Institute, a quasi-government research institute, which annually interviews 5,000 Korean households and 13,783 household members over 15 years of age from 1998 onwards. This survey collects a wide range of information on individuals, which includes a respondent's age, gender, educational background, labor market status, and total hours of work per week, and average monthly wage. Based on the information, we calculate hourly wage.

We use the KLIPS data set for the survey years of 2002-2008 in particular to collect information on individuals' cognitive ability. In 2002 the survey asked respondents aged from 19 to 30 to report their scores of the government-administrated college entrance examination

(College Scholastic Ability Test (CSAT)) on a 12-point scale. The self-reporting of the information may have created measurement errors of the data. Moreover, due to the sensitiveness of the information some respondents refused to report, which brought about loss in information. This also explains why the data are available only for the year of 2002.

The survey also asked respondents to report the name of the university that they attended and the year of entrance. To meter the rankings of the university that they attended, we use a data base of *Jin-Hak-Sa*, one of the major private companies in Korea. This company provides a wide range of information about university entrance, like Barron's Educational Series Inc. in the U.S. Its data base includes average CSAT scores of incoming students for every department of every four-year university on a yearly basis from 1996 to 2008. As described in the previous section, the CSAT scores have been the single most important determinant of university entrance since 1981. Given this, averages of each university's average CSAT scores of entering students are calculated for the period of 2002 to 2008, using this data base.

Based on the calculation, a total of 179 four-year universities are evaluated, and top ten universities are selected as elite (CRD1) and the other universities as non-elite (CRD2 and CRD3). The elite universities include Seoul National University, Yonsei University, Korea University, Korea Advanced Institute of Science and Technology, and Pohang University of Science and Technology, Sogang, Sungkyunkwan, Hanyang, Chungang, and Kyunghee Universities. The elite universities attract students with the CSAT scores within the top 5 percentile ranges.

By combining the two data sets, we constructed a workable data set to estimate the first regression model as specified above. The workable data set include 1,022 observations of a seven-year unbalanced panel data set. Each year the number of individuals covered fall between 139 to 151. Graduates from four-year colleges among those range from 77 to 88 annually, while the others are graduates from two-year colleges. The fluctuations are mainly due to temporary unemployment, to exits from labor markets, and to gradual reduction in the tracking rate of the panel survey respondents. All of these make the panel data set unbalanced. The number of individuals is of relatively small size but the time series data of almost identical individuals enrich the information relevant for the estimation of the model and increase the degrees of freedom.

The two data sets are used for the second model as well. However the CSAT information is excluded from the data set of wage laborers, which considerably allows other data to be available for a larger number of individuals. Although the exclusion of the cognitive ability variable may reduce the power of controlling for unobserved individual characteristics, the enlargement of sample allows us to analyze dynamic patterns of wage changes over time. To control for potential bias that originates from different real values of hourly wages at different time points, we deflate nominal values of hourly wages. Based on this procedure, we construct a workable data set of 4,884 observations which are derived from the calculations of triennial change in real hourly wage of 1,221 individuals, between 1999 and 2002, between 2002 and 2005, and between 2005 and 2008. It is to be noted that the data set is unbalanced due to the same reasons described above.

1.2 Results and discussions

Table 3 presents the estimation and test results of the first model which is designed to test the first hypothesis. We estimate Ordinary Least Squares regressions for a pooled sample of 7-year unbalanced panel data. The reported standard errors are White heteroskedasticity-consistent standard errors. The model 1-1, reported in the first column of Table 3, includes contributions of education (via human capital) to wages as well as those of age, gender, job experience, and squared job experience. All of the coefficients are statistically significant. The estimation results of model 1-1 indicates that an additional year of education increases hourly wage of two-year and four-year college bachelors, masters, and Ph.d's by 12.3 percent. One may argue that the relatively large magnitude of the coefficient of years of education lends support to human capital theory.

Table 3 about here

The model 1A, reported in the second column of Table 3, contains the effects of CSAT on wage, as a measure of individuals' cognitive ability, in addition to all variables included in the model 1A. The coefficient of CSAT is statistically significant. It indicates that an additional rise within 12 ranks of College Scholastic Ability Test scores increases hourly wage of college

graduate workers by 3.5 percent. The estimation results of the model 1B illustrate that inclusion of the variable in the regression model results in some suppression effects on other variables.

The model 1C, reported in the last column of Table 3, includes college ranking dummy variables in addition to all variables in the model 1B. It shows that the coefficient of elite college sheepskin effects (CRD1) is statically significant while those of non-elite college sheepskins effects (CRD2 and CRD3) are not. Furthermore, its magnitude of elite college sheepskin effects is relatively large. The results suggest that on average, the sheepskins of elite college make workers to earn 33.9% more than 2-year college graduate workers even controlling for workers' cognitive ability. In contrast, wage premium effects of non-elite 4-year college diplomas are not statistically significant. One may argue that the empirical results provide empirical evidence for the first hypothesis.

Empirical results regarding the second model are provided in Table 4 which summarizes estimation and test results of determinants of triennial change in real hourly wage. We estimate Ordinary Least Squares regressions for a pooled sample of three time periods using 10 year unbalanced panel data. The reported standard errors are White heteroskedasticity-consistent standard errors.

The results indicate that interaction effects of elite college diplomas and job experience are statistically significant with the 99% confidence level and those of diplomas of colleges whose rankings range from 11th to 30th and job experience is statistically significant with the same confidence level. Comparing the magnitudes of those two coefficients, elite college diploma effects are four times larger than that of the lower group of four-year colleges. In contrast, the interaction effects of CRD3 and 2-year college dummy and job experience is not statistically significant.

Table 4 about here

These regression results suggest that elite college sheepskin effects on growth of real hourly wage increase as individuals' job experience matures while those of non-elite college sheepskins are ambiguous. In general, a worker's wage tends to increase with his/her job experience. However, the magnitude of wage increase differs among workers. These empirical results imply that in Korea, the size of wage growth is determined largely by whether workers graduated from

elite colleges or not. In other words, effects of prestigious college diplomas on wage are accelerating as the years of job experience are getting longer.

The empirical results support our central conjecture that Koreans' demand for education can be explained by the reward structure imbedded in the society in which dual labor market structure is prevalent and elite networks among *Chaebol*, government, and political groups are still working for the establishment and operation of business.

However, these empirical results about the Korean case may differ from the results about the U.S. case. A few studies show that, in USA, the effects of elite college diplomas are not getting larger with job experiences (Dale and Krueger, 2002; Arcidiacono, et al., 2010). We would argue that empirical results depend sensitively on the structure of each society.

2. Conclusions (incomplete)

A short summary (including contributions)

Implications for economics of labor and education and for economics of institutions

Remaining puzzles (why not a rational behavior?) psychological difficulties to ignore sunk costs, social stigma, subjective probability

Limitations: data quality, not controlling for ability in the second model, and other unobserved individual characteristics

This paper proposes a primary conjecture that Korean educational system contributed to accumulating human capital and reducing transaction costs in the earlier years of her industrialization but has degenerated into supplying a status good accompanying its exclusive network in later years. Observing the unchecked growth in college enrollment rate and severe competition for college entrance exam while average college wage premium has been falling, we use social network theory to account for the puzzle.

Our empirical results indicate that the wage premiums of top 4-year college graduates are substantial and their magnitudes have been enlarging as workers' job experience is getting longer.

he empirical results may support that Korean people's common belief that *Hakbol* is very important for ordinary people's life of every aspects. The Korean education case demands further theoretical advance in viewing the relationship between education and the structure of society including labor markets.

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Table 1. Enrollment rates and GNI per capita

	Elementary School	Middle School	High School	Higher Education	GNI per Capita(\$,
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					nominal)
1953	59.6	21.1	12.4		76
1955	77.4	30.9	17.8		81
1960	86.2	33.3	19.9		94
1965	91.6	39.4	27.0	3.3	132
1970	100.7	51.2	28.1	7.4	255
1975	105.0	71.9	41.0	7.4	607
1980	97.7	73.3	48.8	11.4	1,660
1985	99.9	82.0	64.2	22.9	2,355
1990	100.5	91.6	79.4	23.6	6,303
1995	98.2	93.5	82.9	36.0	11,735
2000	97.2	95.0	89.4	52.5	11,292
2005	98.8	94.6	91.0	65.2	17,292
2010	98.6	97.6	92.4	70.1	20,759

Source: For enrollment rates, data before 1970 are from McGinn(1980), and other data are from KEDI(2011). Data for GNI per capita are from database constructed by Bank of Korea.

Notes: (1) Enrollment rate indicates percentage of students enrolled out of corresponding school-aged children. (2) For GNI per capita, data before 1970 indicate GNP per capita.

Table 2. Attainment rate of tertiary education in OECD countries, 2005

Countries	25-64 year-old	25-34 year-old	35-44 year-old
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Australia	33 (24)	39 (29)	33 (24)
Canada	47 (24)	55 (29)	51 (26)
Finland	35 (19)	38 (29)	41 (20)
France	26 (16)	41 (29)	27 (20)
Germany	24 (15)	22 (15)	25 (16)
Greece	22 (15)	27 (18)	26 (18)
Italy	13 (12)	17 (17)	14 (13)
Japan	40 (23)	54 (30)	46 (25)
Korea	33 (23)	53 (33)	37 (28)
Sweden	31 (22)	39 (31)	29 (21)
United Kingdom	30 (22)	37 (29)	29 (21)
United States	39 (35)	39 (35)	41 (36)
OECD average	27 (19)	33 (25)	28 (20)

Note: in parentheses, attainment rates of 4-year college only.

Source: OECD, Education at a Glance 2008: OECD Indicators.

Table 3. Determinants of log hourly wage (POLS with White heteroskedasticity-consistent standard errors)

Variable	Model 1A	Model 1B	Model 1C
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C	5.470*** (0.211)	5.712*** (0.212)	5.827*** (0.234)
AGE	0.044*** (0.006)	0.042*** (0.005)	0.043*** (0.0058)
GENDER	0.090*** (0.032)	0.080** (0.031)	0.082*** (0.0313)
JOBEXP	0.076*** (0.013)	0.074*** (0.013)	0.072*** (0.0131)
JOBEXP ²	-0.002** (0.0009)	-0.002** (0.0009)	-0.002** (0.0009)
EDUYEAR	0.123*** (0.011)	0.094*** (0.011)	0.085*** (0.013)
CSAT		0.035*** (0.006)	0.033*** (0.006)
CRD1			0.269*** (0.087)
CRD2			-0.016 (0.060)
CRD3			0.025 (0.033)
Adjusted R ²	0.362	0.380	0.385
N	1022 (7-year unbalanced panel)	1022 (7-year unbalanced panel)	1022 (7-year unbalanced panel)

Notes: The numbers in parentheses stand for standard errors

*p<.05, **p<.001, ***p<.0001 (one-tail tests)

Table 2. Determinants of triennial change in real hourly wage (POLS with White heteroskedasticity-consistent standard errors)

Variable	Model 2A	Model 2B
C	-11136.7*** (984.4)	-7948.8*** (1239.2)

GENDER	2961.5***(253.3)	2744.7***(246.5)
JOB EXP	202.3***(17.3)	150.4***(18.9)
JOB EXP ²	0.025***(0.0022)	0.019***(0.002)
EDU YEAR	549.6***(77.6)	339.5***(97.3)
CRD1*JOB EXP		410.6***(130.4)
CRD2*JOB EXP		104.2*(60.1)
CRD3*JOB EXP		58.3(36.4)
2-Y CollegeD*JOB EXP		25.3(35.0)
Adjusted R ²	0.13	0.12
N	3703 after adjustment	3146 after adjustment

Notes: The numbers in parentheses stand for standard errors

*p<.05, **p<.001, ***p<.0001(one-tail tests)