Unskilled Immigrants, are they Enemies of Native Workers?

-Study on General Equilibrium Model of Immigration Surplus-

By

Sung-Hoon JEA

THESIS

Submitted to
School of Public Policy and Management, KDI
in partial fulfillment of the requirements
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ABSTRACT

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From the late 1980s, Korea became a new destination of unskilled foreign workers, and they got to compose over 1 percent total labor force in 2000. Mostly coming from underdeveloped, other Asian neighborhood, they work in small, manufacturing factories where natives no more want to work.

According to Borjas' (1994) immigration surplus model, natives benefit from labor import because of production complementarities between immigrant workers and other factors of production. Empirical estimation suggests that 1% unskilled labor import in Korea has contributed to a bit less than 0.002% increase in GDP or about 7 billion won in a 450 trillion won economy in the latter half of the 1990s. This small impact results partly from low percentage of immigrants' presence in Korean labor market. If their fraction increases, foreign workers will bring larger surplus because of high elasticity of factor price for labor. Moreover, diverse socio-economic theories strongly suggest that immigration does not greatly reduce the natives' employment opportunities thanks to segmented labor market structures and after-immigration economic expansion.

Thus, even though there are some disputes on desirable level of immigrants' skill or the effect of income redistribution, it is agreed that foreign workers will play an important role in Korean economic activities when their labor participation expands.

Dedicated to My Parents and My Sister's

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Introduction

From the late 1980s, Newly Industrialized Economies (which had been perceived as labor sending countries) in Asia started to receive unskilled labor from much less developed countries. The Republic of Korea (Korea hereafter) also accepted labor import implicitly from 1987 with a peak of 284,145 workers in December 2000. Asian economic crisis in 1997 shocked to decrease the total of migrant workers, but it recovers to exceed the prior level. The number of migrant workers is still low compared with other traditional immigration destinations such as Western European countries and the United States; however, social issues already emerge on migration. 13 Nepal workers had started to protest against maltreatment and for their human rights at Myungdong cathedral in 1995, and other similar cases for human right concerns and delayed payments were followed.

Unskilled labor import is not only a sociological concern, but it reflects the current Korean economic status as well. Gu-Ro Industrial Complex in Seoul is marked as a low-paid, labor-intensive working place. The urban poor and the young female had fulfilled the labor needs respectively from the 1960s to mid-70s, and up to late 1980s. But nowadays Chinese Koreans replace them. Similar phenomena have occurred in Ansan city in Kyunggi province and others. As other developed countries have faced massive labor migration in a certain level of development with decreased fertility, Korea cannot reverse multiplied foreign labor inflows.

However, many people seem to believe that immigrants replace Koreans in their manufacturing workplaces as was shown in Gu-Ro area, and current high unemployment is partly due to the import of foreign workers. Still others expect labor import will pull down the wage rates and squeeze the natives' level of employment in manufacturing. They are afraid that foreigners will replace Koreans in a labor market. Nevertheless, employers in small and medium size enterprises suffer from high labor deficiency, while insisting to import more labor that they can exploit by offering extremely low wages.

To analyze in which way labor import, especially the unskilled, might affect the Korean labor market is a prerequisite for how we manage the immigration problems. This study has two main questions on it. First is whether immigration increases the general equilibrium of national economy, let alone the sociological impacts. Second is, even though immigration does not harm the total wealth, whether they deprive the native workers of employment opportunities.

To gauge the social costs, until now, many economic studies have tested whether immigrants are complements or substitutes for native workers, and most studies agree that foreigners largely complement with native labor by using partial equilibrium model of different labor market diagrams. But it will be introduced, in my study, the general equilibrium model of George Borjas; how the supply of foreigners affects the total output of economy as well as the labor market. If some positive signs can be found both on labor and output market, we may further argue to open immigrant inflow and stop discriminating them.

Before the prolonged discussion, this paper describes, in the first part, backgrounds on immigrant flows in Korea. Economic theories on both ‘push’ and ‘pull’ factors of labor migration will be discussed to explain the causes of immigration towards Korea. In addition, it will be described the scale of labor migration from the late 1980s and its characteristics such as ethical or skill composition.

In second part, general equilibrium model of immigration surplus will be introduced. Accepting foreign workers is profitable for an economy insofar as there exists immigration surplus, that is, the increase in national income that occurs as a result of immigration and that accrues to natives. Theory itself predicts, when the labor characteristics of migrants differ from those in natives, the profit of labor import can be maximized. The presence of this surplus will be tested on guest workers in Korea, with same frameworks that Borjas did for the U.S. case in his paper, “The Economic Benefits from Immigration” (1994)

In the third part, the diversely assessed analyses will be conducted in a way to justify the test results in favor of the unskilled immigration- immigrants do not reduce the natives’ job opportunities.

In the concluding part, based on the findings, Korean government policies on immigration are critically assessed for further investigations and discussions on a purpose to increase the immigration surplus or enhance the quality of labor market.

Backgrounds on Immigration in Korea

Theories on Immigrant Flows

Before we talk about the foreign workers, it needs to define the terminology. The expression used for them in academics is ‘migrant’. According to international usage, a migrant is someone who leaves a country of which he or she is a national, or who has left it. This person can be called as ‘immigrant’, ‘foreign worker’ or ‘foreigner’ in the country where gainful employment is sought. (Böhning 1996) The meaning is limited in our paper; therefore, the word ‘guest worker’ can be used as well to refer short-term migrants. But demographically justified minorities or humanitarian refugees are not discussed here. In this paper, ‘immigrant’ will be frequently used to stress the side of receiving country, ‘migrants in Korea’

Economic Theories of Migration

A lot of explanatory models have been proposed for migration. Some stress on motivation, while others look at the structures, which force people to decide to leave their countries. Some underline ‘push’ factors from the sending countries, whereas others emphasize ‘pull’ factors from the receiving ones. Stalker (2000) summarized them into four different models under this category. These are neo-classical economic theory, new economics of migration, dual labor market theory and world systems theory.

First two theories put emphasis on immigrants’ motivation on migration. Neoclassical economic theory stresses on the gap in the supply and demand for labor between sending and receiving countries. Workers decide to move in response to larger labor demand and higher wage rates. Neoclassical theory assumes that individuals are so rational to maximize the returns on their human capital.

New economics of migration extends the sight to families or households as well as individual workers. Sending one of their families abroad diversifies earnings as insurance, especially where employment stability is not secured. Liberalization and international trades have weakened the job stability, and this, as a 'push' factor, may make households prone to dissipate their income risks.

Those who prefer structural approaches are interested in four waves of migration in modern history. First wave is marked with settlement in new continents and plantation in colonies from sixteenth to early twentieth centuries. Second wave corresponds to Reconstruction in Europe during the 1950s and the 1960s after the Second World War. Third wave is the construction boom in Middle East in the 1970s. The last flow of labor is the recent immigration into NIEs and Latin America. Structure theories focus on which factors have facilitated four distinctive waves under socio-economic backgrounds.

Dual labor market theory supposes international labor flow as irreversible and persistent phenomenon. In industrial societies, some should work in unfavorable conditions and accept unstable employment. However, indigenous people have been well educated, and they intend to get better jobs. Developed countries cannot but fill the labor blank by 'pulling' foreign workers into their markets. Immigrants, in contrast, especially non-permanent economic immigrants, have less choice but take whatever they can get to earn their bread.

World systems theory focuses on the international capital flow. The capitalist penetration of rich economies to poor ones generates a world system by destroying traditional industries in the latter. A set of mobile labor occurs among who have lost the sources of income, and part of them are 'pushed' to migrate abroad.

In figure 1, four different theories, discussed so far, are classified into four categories.

Figure 1. Migrant Theories under Four Categories

	'Pull' Effect	*'Push'* Effect
Motivation	Neo-classical economic theory	New economics of migration
Structure	Dual labor market theory	World systems theory

Source: Stalker (2000)

Since our interest tries to detect whether there is market gains of labor import in a hosting country, it will be analyzed, if possible, who will get the profit, and when it will be maximized under certain labor market conditions in a receiving country. Thus, dual labor market theory of migration is useful to approach that which *pull* factors trigger labor migration in Korea, and how native labor market is *structurally* affected by foreign labor inflow. Not only the causes of immigration, but the following discussions on the gains of immigration as well will be assessed, based on this theory.

Causes of Immigration in Korea

As dual labor market theory suggests, recent immigration trend in middle-income countries can be understood on the same line that traditional immigration countries have faced more than a century. Freeman and Mo (1996) said that higher economic performance and industrialization in NIEs reached to the point that low fertility and industrial restructuring pulled their natives to higher level of jobs, while low-skilled, labor-intensive work faced labor shortage. The low fertility rate already made rural areas to lose their function of labor reserves for urban manufacturing; moreover, due to around 1 percent Korean population growth rate,

there have been some symptoms of labor deficiency from the beginning of the 1980s. Only the share of female and old age population has expanded, but they are not apt to conduct manufacturing work, which usually requires physical strength. The large demand for labor in service and IT sectors of better payment shows that labor shortage for unskilled, hard working jobs will last in the future.

However, these factors are short of explaining the structural backgrounds on labor import in Korea especially among small and medium size enterprises (SMEs). It should be noted, besides native labor drain, the dramatic increase on undergraduates and strong labor movements, started in 1987. Rapid college enrollment rate has boosted the number of skilled workers and elevated their expectations at work. Together with economic boom, new entrants have sought more safe work with higher remuneration on labor market. But the upturn of strong trade unionism caused to increase male, regular workers' wages in large companies, or make labor market more rigid. This unionism, whether it has been significantly dominant or not, has contributed into two ways. First, as the wage differentials between large and SMEs have been enlarged, competent workers prefer only to work in conglomerates. On the other hand, capital owners in large companies made subcontracts or outsourcing with SMEs to relieve labor costs; the quality of work has been deteriorated in SMEs only to demand low skilled workers. The aggregate result is that labor market is segmented into for large companies and SMEs.

But the increase of skilled labor, in turn, lowered unskilled labor supply. Wages for unskilled workers have been multiplied as well. To downsize high wage costs, SMEs should move plants in cheap, labor abundant countries, but weak capital deters it. Therefore, they started to accept guest workers to fulfill labor blank.

Labor shortage can be clearly noticed among SMEs (less than 300 persons) as is given in table 1. The smaller the establishment size is, the more difficult hiring manufacturing workers. (Extremely low deficiency rates after 1998 mostly results from Asian economic crisis in 1997. But even in this case, small firms still have relative difficulty in getting labor.)

Table 1. Labor Shortage rate in manufacturing, by establishment size (%)

	1990	1993	1995	1998	2000
Total	6.85	6.04	5.80	0.73	1.70
10-29 persons	15.24	7.89	9.64	2.16	3.41
30-99	8.93	7.44	6.62	0.80	3.23
100-299	7.07	10.40	6.82	0.40	1.98
300-499	5.16	5.72	2.87	0.11	1.20
500 or more	2.26	3.21	1.63	0.07	0.35

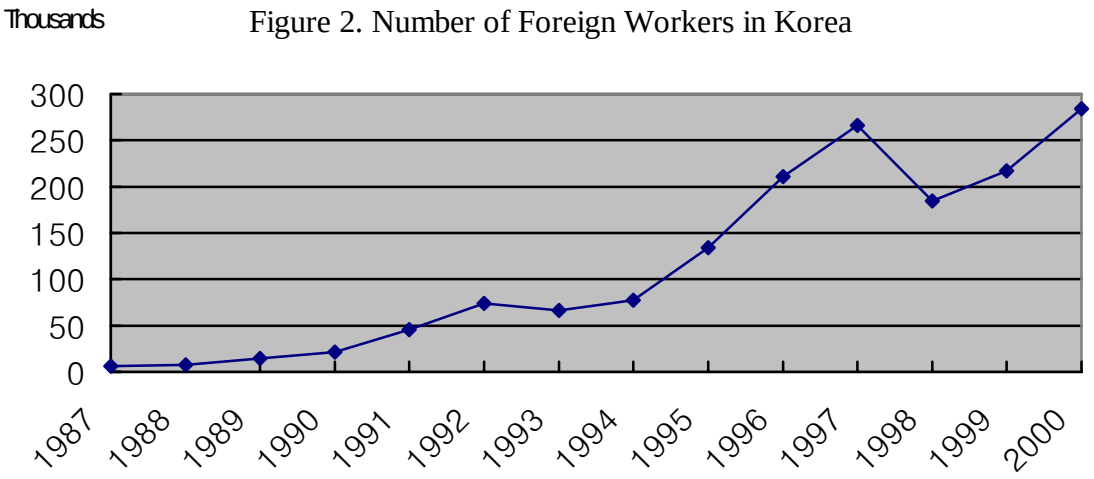
Source: Report on the Labor Demand Survey, Ministry of Labor, Korea, corresponding years

Of course, there are other factors. 1986 Asian Olympics and 1988 Olympics in Seoul could provide chances to show Korean economic development around the world, and many peoples started to be interested in having jobs in Korea. But undoubtedly, reestablished relations with Mainland China and Russia have contributed many Korean origins to settle down in the southern part of the peninsula. The failure of vocational education to meet the needs at work also has stagnated the supply of modest skilled workers. (Seol, 1999) There still exist many other elements to examine, but since this paper focuses on immigration surplus, these things will be discussed later in detail in linkage with that immigration surplus. Before that, the immigration characteristics in Korea need to be examined.

Labor Migration in Korea

Total number of immigrants has increased more than a decade. They were just 6,409 in 1987 but sharply jumped to 284,145 in 2000, markedly during 1994-97 and after 1999. (Figure 2) However, The mere comparison of sums is insufficient to examine the patterns of migration and their causes. The migrants should be classified on legal status, skill or employment sectors for deep analysis. Before going into the immigration data, first glance at the changing migration condition in Korea.

Figure 2. Number of Foreign Workers in Korea

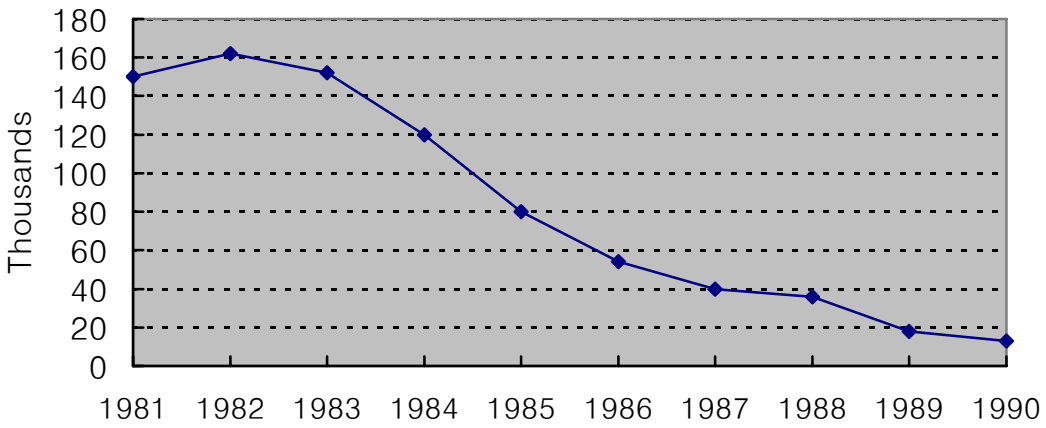


Source: Annual Report on Embark- and Disembarkation, Ministry of Justice, each year

Change from sending to receiving country

Even though Korea became one of the hosts of immigration, it was until recently a major exporter of labor. This massive outflow peaked at the end of 1981, at which point there were over 150,000 Korean contract workers in the Middle East to earn ‘oil dollars’ and send them to their families at home. However, as income and employment expanded in Korean market, labor exports declined sharply (Figure 3). By 1990, the total number of emigrants in the Middle East dropped to 8,000.

Figure 3. Emigration from Korea, 1981-1990



Source: Stalker,2000

However, it does not mean that Korea ceased to be a source of emigration. In 1992, for instance, 23,628 Koreans legally leaved for USA, Australia, Canada and New Zealand. The difference between them and former contract workers lies in that recent emigrants seek to higher quality of life, and their wages and skills are relatively on upper level. But the opposite inflow is our main interest of study. While the type of Korean emigration changed from money for living to higher quality of life, the immigration pattern transformed from small sized, skilled labor to large sized, unskilled labor around 1987. That is, it was almost first time in Korean history that foreigners work in Korean companies under the control and direction of Koreans. So the number and the characteristics of immigration will be deeply investigated.

Diverse statistics on labor import

There are several ways to detect the characteristics of immigrants. Above all, first way is to class them on a legal basis. Migrant workers in Korea are categorized into three groups under the Immigration Control Law. First is the formal employment where legal status is given to skilled workers involved in reporting, business, technology transfer, capital investment, education and research, and entertainment. Second group is unskilled foreigners under the Industrial trainee program. This program was first introduced in 1994,

modeled after the new Practical Trainee Program in Japan. Foreign trainees are allocated into and work for medium-small sized factories, but they are not protected as ‘workers’ on a legal basis. We will deal with this issue on the latter part of paper. Third, illegal workers mattered. Illegal workers denote those who work for companies in Korea without working visa as well as overstayed visa or others. In a detailed format, illegality can be expressed as ⅰ) illegal residence and work, ⅱ) legal residence and undeclared work or ⅲ) illegal employment and work practices (Biffl, 1996), where the latter two categories are also pertinent to native workers.

However, formal employment is excluded from the discussion because the size is small and stable during recent years, but quite different from the last two types in the level of skills that are required. Formal employment is mostly concentrated on skilled work, whereas the other two are unskilled one. In table 2, we can find out unskilled workers, who participate in simple processing or assembling, overwhelmingly takes more than 90% of whole immigrants from the beginning of the 1990s.

Table 2. Foreign Workers by Legal Status, 1987-2000

Then, it is a next question that who composes the pool of unskilled migrants. Along their origin of countries, the top five sending countries to Korea are China, Philippines, Indonesia, Vietnam and Bangladesh in 2000, that is, 70% of all immigrants come from these countries, which are geographically located in East Asia. Wage differentials, volume of trade and direct investment other than geographical proximity may trigger large flow of migrants, but it is beyond our subject to figure them out in this page.

However, as one of the largest diaspora nations, Korea opened the border to a lot of Koreans abroad (especially Koreans in China). Korean government facilitated the entry of Koreans abroad on strong brotherhood at the initial phase. On the other hand, Korean companies were eager to recruit them since they did not need to worry about the language problem. Freeman and Mo (1996) assumed that Korea gives preference to potential migrants with whom they share same ethnicity. But this does not mean Korea accept more migrants on a sort of nationalistic grounds. The homogeneity of people may help to replace other nations for Koreans abroad; this does not necessarily lead to expansion in total quota of immigration since the government strictly controlled the size of migrants on economic needs under the Industrial trainee program. On the contrary, the preferable immigration policies for them actually were stopped in 1995. In table 3, migrants in Korea are denoted by nationality and brotherhood. We can see Chinese Koreans still share a large part of immigrants in both foreign trainees and illegal workers.

Table 3. Nationality, Brotherhood of Foreign Workers, 2000

The most important statistics may be types of industries where immigrants are employed; in terms that companies who suffer massively labor deficiency recruit more foreigners, and these findings can be linked to dual labor market structure. First, in size of enterprises, 78.1% of immigrants under the Industrial trainee program worked in a medium size company of 21-200 employees in 1995. More specifically, they are allocated by 29.8% for company size of 51-100, 29.4% for 21-50, and 18.9% for 100-200. (Table 4) As for illegal workers, there is no official data on their employment. Only sample data exist, which was conducted

by Seol (1999) with 620 cases in 1995. 40.6% of them worked in a small size company of 10-29 employees. (31.7% of Chinese Koreans and 54.8% of other nations) (Table 5)

Table 4. Foreign Trainees on Each Size of Firms, 1995

Table 5. Illegal Workers on Each Size of Firms, 1995

Second are types of job. 86.4% of trainees and illegal workers are engaged in fiber/textile (46.8%), fabricated metal products/machinery and equipment (28.0%), chemicals/plastic products (11.6%) in 1995 (Table 6) by frequently doing simple processing. Other study found that foreigners also participate in construction, agriculture/fishery, housekeeping, food, mining and others. Construction, agriculture and mining are perceived as the major work of immigrants in U.S.A and Western Europe, but the portion remains almost negligible in Korea. It is partly because these sectors are relatively small compared to other countries, or labor import in certain sectors is strongly deterred by government's restrictive policies.

Table 6. Employment by Industries, 1995

In this section, we found out that labor inflow has expanded over a decade, and Korea became a destination of migrants. In the 1990s, unskilled immigrants, who are composed of trainees and illegal workers, have dramatically exceeded skilled ones in size. Mostly coming from other Asian neighbors, they conduct simple work in small, manufacturing factories. We can, thus, support that the migrants work in SMEs where labor shortage is structurally severe, and that their types of jobs are related to a work unfavorable and hard but needed in a segmented labor market. Thus, the statistics we discussed so far may provide a meaningful feedback for analyses for labor migration that will be examined in the following parts.

Gains from Immigration

Theoretical Framework- Immigration Surplus

When immigration occurs, do natives gain profits? If so, how large the gains are, where these benefits come from, or who will get them? In order to compute the net economic impact of immigration, immigrant contribution to the hosting country should be measured.

There is one static way to assess this size of the contributions. Consider a labor market diagram presented in figure 4, the supply and demand curves are denoted as S and D, (labor supply curve is assumed to be inelastic; in other words, there is N number of native-born workers.) In a competitive labor market condition, wage will be set at the point of W_0 with N level of employment unless immigration is allowed. So, the trapezoid ABN0 means the values of national income that each worker and capital owner earns prior to immigration. However, when immigrants enter the country, the supply curve moves to the right (from S to S') by the number of guest workers (G), and the total size of workers in that country increase to M (=N+G). Given the increased labor supply, wage level tends to fall to W_1, but national income expands the size to the trapezoid ACMO

If the changes are deeply analyzed, by using extra and cheaper workforce, capital owners or employers get initial benefits in the triangle ABW_0, and plus additional profits by the area in W_0BCW1 where the rectangle W0BFW1 is exactly transferred from the incomes of native workers. The rectangle FCMN goes to the immigrants. So the increase in national income that accrues to natives is given by in the triangle BCF. This triangle represents *immigration surplus* that results from immigration, and that is supposed to return to the natives, esp. native-owned firms. (Borjas, 1999)

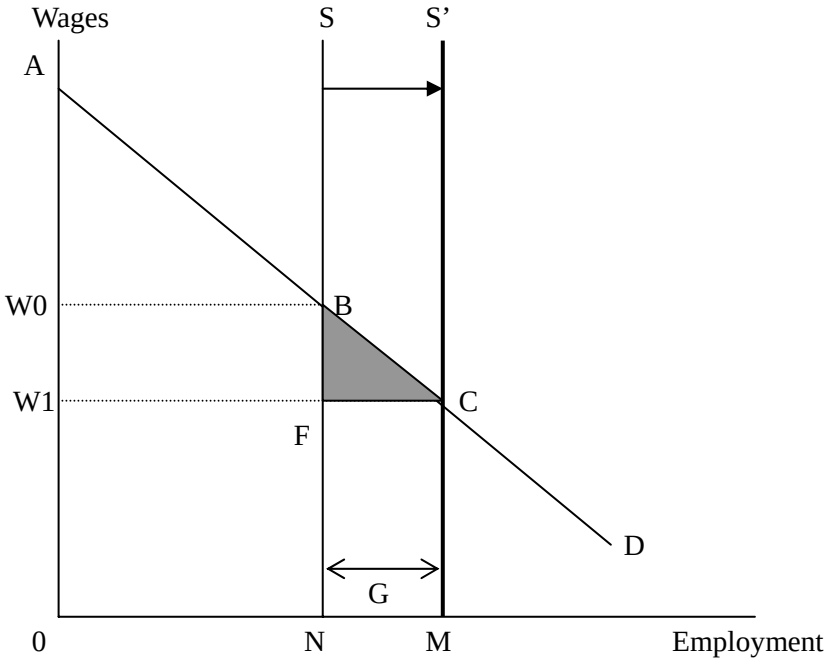


Figure 4. Immigration Surplus

Source: Borjas, 1999

George Borjas' Immigration surplus arises since the market wage equals the productivity of the last immigrant hired. As a consequence, immigrants contribute to increase national income by more than the costs owed to them. But as is depicted in figure 4, without paying lower wages to native workers, immigration surplus cannot be obtained. Suppose that the demand curve is perfectly elastic, immigrants or labor increase have no impact on the native wage rate. It suggests that the immigration surplus is proportional to the elasticity of factor price for labor. When the elasticity of factor price is small (in absolute value), the surplus as well will be small. In other words, unless labor demand curve is inelastic, immigration surplus cannot be maximized. It implies that natives gain from immigration when there exist production complementarities between immigrant workers and other factors of production. (Borjas 1994) These other factors of production can be capital or labor that has different level of skills. And the latter case entails that, if immigrants differ from natives in their skills and types of jobs, immigration can bring benefits to the hosting country.

The value of immigration surplus, or the size of the triangle BCF can be measured by the following formula,

$$\text{Immigration Surplus} = \Delta Q_n = \frac{1}{2} \times (W0 - W1) \times (M - N) \qquad (1)$$

Then, Borjas manipulated this formula, in order to easily show immigration surplus as a fraction of national income,

$$\frac{\Delta Q_N}{Q} = -\frac{1}{2} sem^2 \qquad (2)$$

where s is labor's share of national income, e is the elasticity of factor price for labor and m is the fraction of the work force that is foreign born. (m=G/M)

But, this immigration surplus formula fails to include the skill differentials that exist both within and across the natives and foreign workers. As Korea has accepted large pool of the unskilled workers, a government can formulate the policies to admit certain classes of workers. Immigration surplus can be maximized when immigrants are complements with other factors of production; it is our interest to know whether the surplus would be enlarged if we assume native and immigrant workers are different in their skill.

Second formula suggested by Borjas takes this into account. Labor force is divided into skilled workers and unskilled ones. The portion of skilled workers in the native population is b, and the respective portion in immigrants is marked as β. The complicate formula is,

$$\frac{\Delta Q_N}{Q} = -\frac{1}{2} \frac{s_S e_{SS} (\beta - b)^2}{p_S^2 (1 - p_S)^2} (1 - m)^2 m^2 \qquad (3)$$

where s_S is the share of national income that accrues to skilled workers; e_{SS} is the elasticity of factor price for skilled workers; and p_S is the fraction of the labor force that is composed of skilled workers.

Insofar as the skill composition of foreign workers are not identical to that of the natives (when $b \neq \beta$), the computation will show positive results. So, once again, the more different two groups of workers in skill, the immigration surplus will be larger.

Empirical Tests

We already found out that immigrants in Korea are especially unskilled workers. These workers, who come from less developed countries such as China and Philippines, are supposed to do semi-skilled or non-skilled work in textile, machinery or others. Thus, our estimation of immigration surplus has three objectives. First, it is to measure how large the current size of immigration surplus is in Korea compared with prior study in the U.S. Second, we can test out whether importing the unskilled labor is more profitable than the skilled one, and finally, whether immigration has income transfer effects.

Simple Immigration Surplus in Korea

First, in order to calculate immigration surplus as a fraction of GDP, it needs to compute the values of each variable on a simple equation (2); s, e and m. Korea's labor share in national income (the value of s) has been around 0.60 or 60%, when it is estimated in ratio of employee compensation to NI, but it tends to decrease from 0.642 in 1996 to 0.586 in 2000. As for the elasticity of factor price for labor (e), Hamermesh(1993)'s simple assumption is used to measure it. He describes, if there are only two factors of production (labor and capital), the value e must equal $(1-s)^2/\eta$, where η is the output-constant elasticity of labor demand. Suppose η is about –0.3 in Korea as Borjas used in his calculation on U.S. case, the

elasticity of factor price for labor becomes around –0.5. Since labor's share in national income is decreasing; the absolute values in elasticity have increased over years. Finally, the fraction of foreigners in labor force (m) remains still low, 1% of labor force. But, the number of illegal workers cannot be reported accurately, so this figure can be a rough estimation. The values of each variable from 1996 are summarized in table 7.

Table 7. Values of Each Variable in Equation (2)

	2000	1999	1998	1997	1996
s	0.586	0.597	0.616	0.628	0.642
e	-0.571	-0.541	-0.492	-0.461	-0.427
m	0.013	0.010	0.007	0.011	0.010

Source: National Statistical Office, Ministry of Labor and others

Immigration surplus only represents tiny portion of GDP. We can notice that the sum of immigration surplus is proportional to foreign labor fraction in workforce. Dramatic increase in surplus in 2000 seems to partly come from large share of immigrants (higher m), while exceptionally low economic gains in 1998 result from subsequent lower labor demand after the 1997 economic crisis, and sluggish economic activities in East Asia. (Table 8)

Table 8. Immigration Surplus in Korea

	2000	1999	1998	1997	1996
Surplus, % in GDP	0.0028	0.0016	0.0007	0.0017	0.0013
Surplus in billion won	13.3	7.0	2.8	7.2	5.2

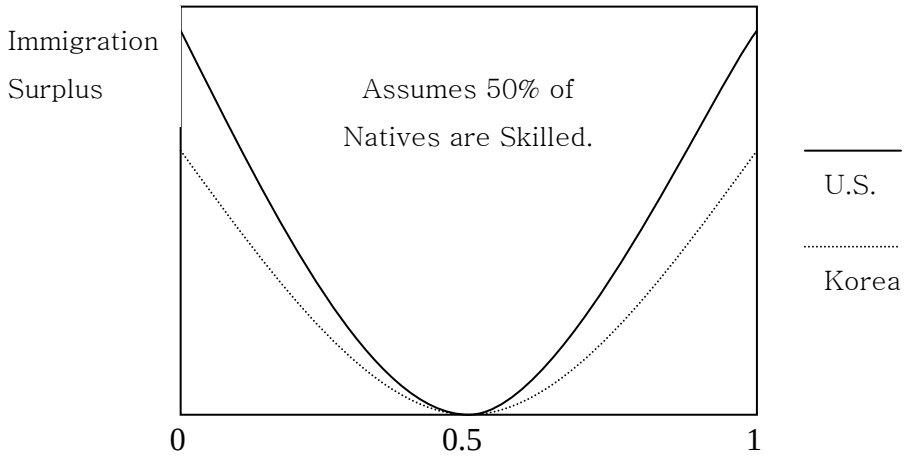
This amount is still small compared to Borjas' calculation for the U.S., which equals to 0.1% of GDP. The major factor in cross-country difference lies in the minor portion of immigrants in Korean labor force.

Because a fraction of foreigners in labor force (m) is squared in the equation, 10 times larger share of immigrants in a country leads to 100 times differences in surplus scale. However, suppose the fraction of foreigners in labor share is equal both in the U.S. and Korea such as 0.1, immigration surplus will be larger in Korea. Even though the Korea's share of labor (s) is relatively small, bigger absolute value of elasticity for labor (e) promises higher returns. It means when labor supply increases, the wage level falls far greater in Korea than in the U.S. In other words, the elasticity of factor price gets larger (in absolute value) when the labor demand curve becomes inelastic, and the natives can assess the higher benefits from immigration when the more labor and capital are complementary. This issue will be briefly discussed in the following sections. Anyway, under this simple assumption, Korea can possibly get much more profits by accepting foreign workers than the traditional immigrant destination of the U.S.

Skill Differentials among Labor Force

Evidently, labor force is composed of diverse skill groups, and their contribution to economic gains may differ. As was done by Borjas in equation (3), we can expect the larger benefits when Korea accepts exclusively skilled or exclusively unskilled workers, assuming that 50% of natives are skilled and capital does not play anything in production. The difference between Korea and the U.S. is that the immigration surplus is relatively small in Korea due to currently low fraction of foreign workers in labor force (small value of m). These low gains are denoted as flatter dotted line in figure 5.

Figure 5. The Immigration Surplus and Immigrant Skills, in a Model without Capital



Complementarities between capital and labor

When Korea decides to import only skilled foreigners, immigration surplus as a fraction of GDP can be given by,

$$\frac{\Delta Q_N}{Q} = -\frac{1}{2}\frac{s_S e_{SS}}{p_S^2} m^2 \qquad (4)$$

where s_S is the share of income that goes to skilled workers, e_{SS} is the elasticity of factor price for skilled workers, and p_S is the fraction of skilled labor force.

On the other hand, in case that Korea accepts only unskilled immigrants, which is more close to the current skill composition of guest workers, the surplus can be denoted as,

$$\frac{\Delta Q_N}{Q} = -\frac{1}{2}\frac{s_U e_{UU}}{p_U^2} m^2 \qquad (5)$$

where s_U is the share of income that goes to unskilled workers, e_{UU} is the elasticity of factor price for unskilled workers, and p_U is the fraction of unskilled labor force. (Borjas, 1994)

In a real world, however, capital plays an important part in the production process. If a native-owned capital shapes the relative gains to skilled and unskilled migrants' flows in a different ways, policy suggestions for immigration may be changed. Hamermesh, (1993) said that the elasticity of factor price is greater for skilled workers than for unskilled ones ($|e_{SS}| > |e_{UU}|$). But it is well noted that the bigger elasticity for factor price is, the larger the immigration surplus will be, and it further means that skilled workers are more complementary with other factors of production such as capital. When skilled workers turn out more complementary with capital than unskilled workers, immigration surplus will be maximized by allowing skilled labor import in a condition that half of native workers are skilled. Thus, Korean immigration policy should be rectified to correct the currently 6% of skilled foreigners in total labor inflow.

It is a conventional wisdom that skilled workers can be more complementary with capital since the price of capital goods such as computers is going down during recent decades. (Ehrenberg, 2000) However, it is not always true in Korea where its traces of economic development are a bit different from those of developed countries. Krugman and Obstfeld (1994) said, in international trades, the U.S. have comparative advantages on high-tech industries, which requires massive capital investment in R&D, but disadvantages on mass production, since rapidly industrializing countries copy the technologies once made within a couple of years, and produce them in mass in cheap factor prices including labor. Korean economy has followed technology duplication policies for decades and has exported manufacturing products *as good as* those in developed economies. So, different from that in the U.S. and Western European countries, Korean capital stock may not be fit for skilled workers who will use innovated technologies, but for relatively unskilled ones who can operate the machinery.

In B. Lee's study (1995) on substitutability among workers with diverse skills and capital, he found that in three manufacturing industries; textile, chemistry and fabricated metal products in Seoul, skilled male workers are substitutes for capital (the coefficients are largely negative in table 9). But most importantly, capital is significantly complementary with unskilled labor and immigrants. In fewer than 50 employee size firms, unskilled workers and immigrants become complements with capital in a 99% significance level. The size of coefficients for complementarity gets the largest when below 100 person SMEs are estimated. (As for the unskilled immigrants, the coefficients are 0.827 in all size, 0.955 below 100 persons, and 0.946 fewer than 50 person size firms)

Table 9. Partial Elasticity of Complementarities in Three Manufacturing Industries in Seoul by Firm Size

We cannot definitely conclude that unskilled immigrants are complement with capital based on that single research. But his case study leaves a possibility that the elasticity of factor price may not be greater for skilled workers than for unskilled workers (or $|e_{SS}|$ gets smaller than $|e_{UU}|$). Contrary to Hamermesh's prediction, it becomes also feasible that importing unskilled workers can be more beneficial. We cannot but open this question unanswered until another detailed work is done. Nevertheless, as Korea has been interested in R&D and technology oriented development, accepting exclusively skilled foreigners may bring more profits some day in the future.

However, let alone demand side factors we will discuss in the next part such as dual labor market structure and external effects, it is almost indispensable to accept the unskilled foreign workers on the labor supply side as well. Under the Roy Model of self-selection for immigration, the reason that unskilled labor inflow is dominant comes from the low rate of return to skill in Korea. If sending countries' income inequality is larger than the income distribution in the receiving country, unskilled labor inflow can be expected. Low-income disparity for skills in Korea, even though it is increasing nowadays, supports that it is not an easy policy decision to change the skill composition of immigrant flow. As long as the returns to skill are relatively small, skilled foreigners will be reluctant to work in Korea. If Korean government tries to ban the unskilled labor inflow on a belief that immigration surplus will be magnified by allowing skilled labor import, the total supply of immigrants will dramatically fall, and the amount of immigration surplus as well.

Redistribution

As is discussed in theoretical part, immigration surplus is based on the wage fall due to immigrant labor inflow. So, workers can earn less, while capital owners earn more. Native workers lose their income by W0BFW1 in figure 4, but it goes to the capitalists' pockets together with the triangle ABW0 derived from immigrants. Capital owners get the W0BCW1 in total. The transfer of wealth can be depicted by the following formulas.

$$\frac{\Delta Q_W}{Q} = sem(1-m) \qquad (6)$$

$$\frac{\Delta Q_C}{Q} = -sem(1-\frac{1}{2}m) \qquad (7)$$

(6) indicates the net change in income of the native workers as a fraction of GDP (or W0BFW1), and (7) for capitalists (W0BCW1).

When Korean data are inputted, the size are supposed,

Table 10. Amount of Redistribution as a Fraction of GDP in Korea (%)

	2000	1999	1998	1997	1996
$\frac{\Delta Q_W}{Q}$	-0.4293	-0.3197	-0.2106	-0.3149	-0.2713
$\frac{\Delta Q_C}{Q}$	0.4322	0.3213	0.2114	0.3167	0.2727

Native workers lose around 0.4% of GDP, or 2,044 billion won in 2000. It is a huge loss for the part of native workers enough to distort the labor market incentives to work. But, on the other hand, since capital owners try to get more benefits by using cheap labor, they will invest their additional profits to expand their industries. This possibility can predict not only more job opportunities but the re-increase of wage in fixed labor supply economy as well. This issue will be issued when discussing external effects in the following part.

So far, we have talked about immigration surplus in Korea under the Borjas' theoretical framework, and we found that 1% unskilled labor import have contributed to slightly less than 0.002% in a Korean economy during the latter half of the 1990s. This impact seems to come from low percentage of immigrants in Korean labor market. If their fraction increases, foreigners will bring large surplus because of high elasticity of factor price for labor. But it cannot be concluded that which way is more beneficial between importing more skilled workers and maintaining unskilled immigrants' current inflow under the uncertain role of capital. We do not either clearly know whether the transfer of income from workers to capitalists show positive or negative signs on labor market.

However, it is certain that Korea can get benefits by allowing foreign workers in sum. We have discussed so far the immigration surplus on the assumption that immigrants receive the same amount of wages with the natives in a same skill level. But in a real Korean situation, guest workers earn less than Koreans. Employers in SMEs do not pay market price wages because foreign trainees are not ‘workers’ in a legal standard, and that illegal workers cannot appeal to the court against low payment due to their weak legal status. Suppose that unskilled foreigners earn about 80% of the native wages (as it costs for a foreign trainee), capitalists can get more from FCMN in figure 4. As for the Koreans, they may be delighted to extract a bit more from foreigners. But immigrants are a weak minority that needs protection. Even though they come to Korea for their benefits, it is also true that they contribute to Korean economic development. On the humanitarian perspectives, we cannot let them exposed to maltreatment and labor exploitation in expense for Korea’s bad reputation of enslaving unskilled immigrants who are out of legal protection and social securities. On a long-term economic view, when it is internationally publicized that guest workers are exploited, future job seekers in foreign countries change their destination for work to other countries such as Taiwan or Japan. By blocking future labor inflow, Korea will get smaller immigration surplus than otherwise would. As long as immigration surplus can be derived even when immigrants earn in a competitive market wage level, both Koreans and immigrants accomplish Pareto Efficiency with an increased wealth for both groups.

Some Problems in Korean Case

But, some problems reside in the calculation. Borjas' immigration surplus assumes that immigration increases the economy's labor stock. The immigration surplus model only supposes the way that a native owned capital stock has an effect on the relative gains to skilled and unskilled migrants. So, it fails to consider the case that immigrants themselves bring in capital. As Borjas predicted, if immigrants expand the capital stock as well as the size of the labor force by 100 percent, this would not alter the factor prices as long as the production function has constant returns to scale. An immigration policy, for example, *Business Investor Category* lies in that case. In order to immigrate to New Zealand, the foreign applicants should bring in at least NZ 750,000 (or US$ 312,000) under the condition that he/she invests in new business in a hosting region. But this case does not happen in Korea. First, most of immigrants are categorized to the poor and unskilled. They come to Korea to gain their bread. Second, Korean government does not pursue such kinds of investor visa policy.

Another, but more serious problem is; immigration surplus arises based upon that immigrants lower the wages of native workers. But many studies found out that immigrant inflows do not reduce the earnings of the natives. For example, David Card (1990) researched whether the Mariel boatlift on the Miami of 1980 had influenced the Miami labor market. On April 20, 1980, Castro government in Cuba declared that Cubans who wish to go to the U.S. can leave from the port, Mariel; as a result, around 125,000 Cuban immigrants arrived in Miami from May to September 1980 and about half of them decided to remain there. This result was the dramatic increase in the labor force by 7%. Succinctly, the experiment says the Mariel immigration has negligible impact on wages in Miami labor market.

Unfortunately, the available data cannot be found in Korea. But theoretical work (Song, 1997; B. Lee, 1995; Uh & H. Kwon 1995) predicts guest workers will not greatly reduce the wages of native Korean workers. How this could happen? That might be one reason that immigration surplus is usually small. Nevertheless, even though immigrants do not have an impact on the earnings of native workers, it does not mean that immigration has little impact on natives' current and future employment opportunities. Since the opportunity problems imply quite opposite policy directions on immigration, it is worthy of discussing. The following part may let us trace them in diverse ways.

Beyond Immigration Surplus

Immigration surplus and Dual Labor Market Theory

Immigration surplus only explains that labor import is profitable for the economy, while dual labor market theory deals with the causes of labor flow. But these two have some similarities that these models divide labor market into two: skilled and unskilled jobs. At this point, it should be clarified whether Korean labor market is really segmented so as to support our previous presumptions and discussions. But it is another question to suggest that this dual labor market structure does not pose impediments on the natives' employment opportunities.

As we already mentioned on the causes of the immigration, wage differentials between large and SMEs have been widened in Korea. A worker in a firm with more than 500 employees earned 741,000 won per month compared to 549,000 won (or 74%) with 10-29 employees in 1990, but the wage rate grew 2,195,000 won versus 1,497,000 (68%) in 2000. (Figure 6.) The causes of this wage disparity have been derived from market factors (increased labor demand but decreased supply) as well as dual labor market structure of unionism.

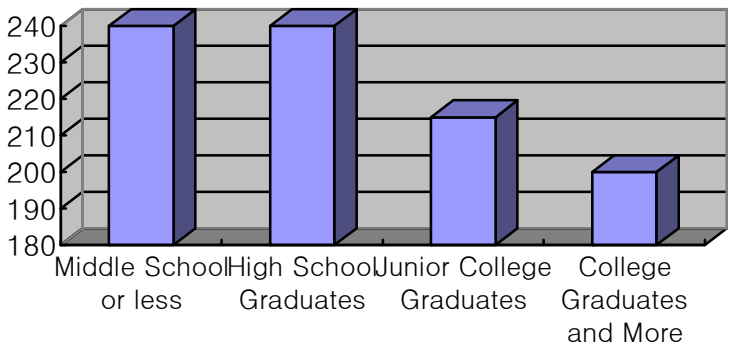
Figure 6. Wage Level by Establishment Size

But how the wage differentials in each firm size are related to skill differentials? There have been two distinctive trends in demands of labor. First is, the proportion of SMEs in manufacturing employment has increased since the mid-1970s, but, secondly, each firm in different size demands different types of skilled workers. (Lee, 1999) For example, the portion of large companies with more than 500 employees in

manufacturing employment has decreased from 45.3% to 29.5% from 1978 to 1998, while the corresponding portion of SMEs in manufacturing employment with 10-99 regular workers has increased from 24.3% to 45.1%. (Lee, Moh and Kim, 2001) This increasing share of SMEs in manufacturing employment was not noticed in any other advanced country. However, most employment in SMEs still has been concentrated among light industries such as beverage, textile, and rubber. It is a unique situation in terms that large companies in Korea have transformed their export business from light to heavy industries, which demand highly productive and skilled workers. The expansion of service industry also has drained labor reserve in manufacturing sectors. It definitely contrasts with SMEs' situation to seek cheap, large pool of labor. In sum, demand patterns between large firms and SMEs came to differ in quantity as well as in quality.

On the supply side, the decline of young people is responsible for the overall increasing wage rate. Labor supply cannot meet the rapidly elevating labor demand like in Korea that has pursued export-oriented growth. Thus, wage level for the unskilled workers has been raised steeply. The wages for those who completed middle school or less has augmented two and half times from 1990 to 2000. (Figure 7)

Figure 7. Wage Increase Rate by Educational Attainment (%) from 1990 to 2000



Source: The Profile of Korean Human Assets, KLI, 2001

Even though wage increase is lager among the unskilled workers, the wage disparity by firm size largely results from the human resources accumulations. After the 1980 reform in entry quota of university, the number of highly skilled has increased in labor market, while the decreasing enrollment in vocational high schools has diminished the number of intermediately skilled workers that SMEs usually need most. Moreover, large firms can provide expensive firm training as their scales permit to pay the costs. Therefore, workers with similar level of education and age will get different wages in the long run whether they can access training programs or not. The consequence is a difference in productivity. (Lee, 1999)

The level of productivity in SMEs had remained around 60% in the early 1970s compared with large enterprises, but it dropped to 39% in 1995. In order to discourage the productivity gap, SMEs should offer training and high wages as well, but large firms already raised the market wage so high that SMEs cannot afford to pay. The other choice is to get certain skill level of workers from vocational high schools, but the low enrollment and poor level of education have blocked it. (Lee, 1999) SMEs came only to attract low skilled workers who are willing to accept extremely low wages, but since they cannot get regular workers at market wages, they might use part-time or fixed-term workers. And this definitely leads to a vicious circle of further deteriorating productivity, discontinuities in production and so forth.

However, the market factors are a little bit short of explaining the rapid wage dispersion after 1987. With democratization, unions were legalized and they had more power to negotiate their wage level. The problem lies in that the unionism is limited on regular as well as male and production workers in large enterprises with more than 1,000 workers. (Table 11.) Large firms, esp. so called *Chaebols*, have got economic rent

under strong government protection, and employees sought part of it as an increase in wage when they could successfully form an internal labor market by using strong labor movements. Thus, wage differentials tend to be more widened whether there is economic rent to share and strong unionism to seek it.

Table 11. Unionization by Establishment Size (1993)

Firm Size (employees)	Rate (%)	Firm Size	Rate
10-29	0.9	500-999	37.5
30-99	5.4	1,000-4,999	59.6
100-299	26.3	5,000-15,000	62.1
300-499	36.4	15,000	76.0

Source: Lee and Kim (2000)

The threat effect of unionization suggests another explanation of labor market segmentation. If an owner is afraid that their workers are organized to protest against him, he will be generous enough to pay as high wages as prevalent in similar size and types of unionized firms. That threat effect will be overwhelming if, and where unionism is dominant. That is why large firms usually have ended up with high level of wage rate. (Nam, 1999) High wage costs for their workers, in turn, let employers to choose subcontract or outsource part of their production to SMEs. Another problem is that dependent SMEs usually conduct simple repeated works that innovative ideas are not required. If subcontractors need to perform solely simple works, demand for high skills and skilled workers will be absent, and the business progress is limited. (Lee and Kim, 2000) It provides a different cause that new labor market entrants avoid to work, or, even they started to work, show high job separation rates in SMEs.

All these long explanations conclude that Korean labor market is divided into large companies (or skilled workers) and SMEs (or unskilled workers), and the deficiency for the unskilled labor in SMEs is a kind of indispensable and structural side effect on the way of development. Cheap and unskilled native workers are not abundant enough to provide sufficient labor that SMEs can afford to buy. The share of skilled workers in workforce is increasing, but SMEs fails to attract them, or apparently, they even do not want them. As for the workers, they prefer large companies that give them positive feedbacks of higher wages and productivity. We cannot imagine, in segmented Korean labor market conditions, the unskilled immigrants deprive the places of the natives in work places. It does not need to show again the labor shortage rate by firm size presented in table 1, but the following data on related-production labor shortages fully describes the reality that the smaller the firm size is, the more difficult to find workers (or the smaller the number of job applicants), even when total labor shortage has been reduced in 2000.

Table 12. Related Production Labor Shortage Rate by Firm Size (%)

	10-29	30-99	100-299	300-499	500 +	Total
1994	11.9	8.3	4.1	2.5	1.5	5.4
2000	3.69	2.28	2.09	0.89	0.40	2.02

Source: Report on the Labor Demand Survey, Ministry of Labor, Corresponding year

Table 13. Related Production Labor Shortage Rate by Skill Level in 1998 (%)

	Supervisory Skilled Workers	Skilled Workers	Semi-Skilled Workers	Unskilled Workers	Total
All Size of establishment	0.7	0.8	1.3	2.6	1.0
SMEs (10-299 persons)	1.1	1.1	1.9	3.8	1.4

Source: Report on the Labor Demand Survey 1998, Ministry of Labor

Song (1999) provides other kind of support on that cheap, unskilled labor supply is in short. He conducted extensive surveys on firms that use foreign trainees. Around 270 sample SMEs with 5-299 employees over different regions and industries responded. When looking into the responses that how to fulfill labor shortage, above half of the employers answered they will hire immigrants.

Table 14. How Employers Respond to Labor Shortage

	Retired Natives	Foreign Workers	Active Natives	Others	Total
Responses	38	145	81	8	272
Percentage	14.0	53.3	29.8	2.9	100.0

Source: Song, KIET, 1999

In table 15, the responses are categorized in detail by industries. Outstanding portion of 74% in metal products industry, which frequently requires physically hard work, prefer foreign workforce.

Table 15. How Employers Respond to Labor Shortage by Industries

As for the retirees, low physical strength to support hard, labor-intensive work can be a reason that employers are reluctant to recruit. Whereas, as for the active working population, high market wage rate but low financial capability to afford them is an impediment. So, Song raised another question that, if government promises a subsidy in order that employers can purchase native workers in market price, how much extra money per head/month the subsidy costs. 33% responded 300,000 won/month, and 25.5% 400,000 won/month. This amount is huge in sum for government, and even if it is feasible, market distortion will definitely appear in forms of growing tax burdens that lower real wages; thus, provide disincentives for work among the native labor force,

So, it is quite instructive that employers in SMEs use immigrants mostly because they cannot find workers who are willing to receive low wages. (Table 16)

Table 16. Reasons to Use Foreign Workers

	Responses (1)	Percentage	Responses (2)	Percentage
Lack of Native Applicants	85	41.7	68	63.6
Low Wages	54	26.5	34	31.8
Higher Productivity	23	11.3	4	3.7
Others	42	20.5	1	0.9
Total	204	100.0	107	100.0

Source: (1) Song, KIET, 1993, (2) Park, Korea Small Business Institute, 1994

In addition, the fact that native workers prefer service to manufacturing work, such as hotels, restaurants and others, add another reason SMEs are difficult to fulfill labor shortage. Moreover, most plants are located outside the metropolitan areas. The large commuting costs only add fixed costs of working for the urban natives (B. Lee and J. Kwon, 1997). On the other hand, newly arrived immigrants have advantages to freely settle down near plants, and subsequent low commuting costs increase the incentives to overnight work.

Under these complicated market situations of labor shortage and high price, it is possibly imaginable that unskilled immigrants serve Korean economic activities, which otherwise did not work well. Dual labor market structure in Korea has attracted foreign labor, whether we want it or not, and further it suggests immigrants may have different labor markets that natives do not prefer.

External Effects

Since labor demand and supply influence each other, labor market equilibrium changes throughout time. We can imagine how these changes positively affect the job opportunities among the native workers. Figure 4 showed graphically how the increase in labor supply leads to immigration surplus. But when immigrants earn money, they spend some of them in a host country. They purchase necessities or some entertainments, such as their local foods, books or videos of own language, so they open different kinds of shops, which might interest some natives as well.

In figure 8-1, increased wealth for the natives (or immigration surplus) and new incomes of immigrants permit whole workers to have more purchasing power, and they will demand more products in output market. Product demand curve moves to the right (from D to D') and the price for goods will rise. In response, employers will urge to get more workers in order to produce more output. The demand for labor will be enlarged, and labor demand curve will shift to the right to D" in figure 8-2. Under the excess labor demand situation, firms will offer higher wage to get more workers unless labor supply extends faster than the demand. (In case that labor supply is fixed, only wages go up.) We can imagine that the wage increase, caused by this external effect, may partly offset the initial wage fall at the entry of immigrants. The increased labor demand may provide a basis that wage fall cannot be easily detected, and immigrants do not deprive the natives of job opportunities in the real world.

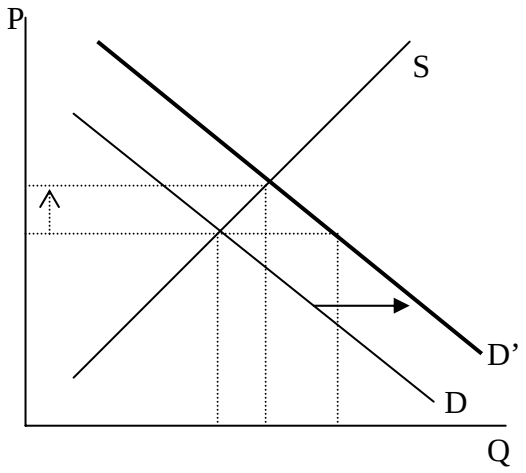


Figure 8-1, Product Market

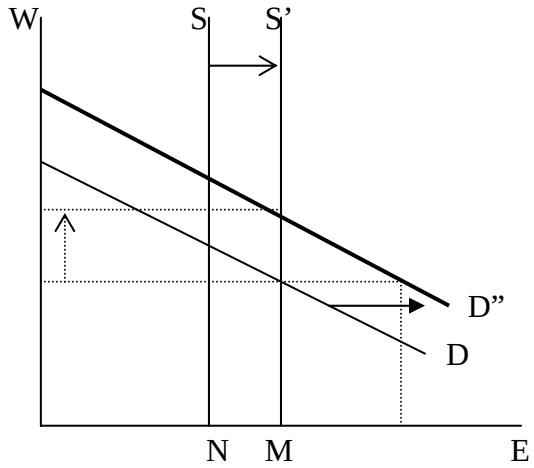


Figure 8-2, External Effects in Labor Market

External effects also can be measured as a fraction of GDP by using the other formula, and it is given by,

$$\frac{\Delta Q_N}{Q} = -\frac{1}{2} sem^2 + \frac{\gamma \cdot sm}{1-\gamma}(1-sm) \qquad (8)$$

each variable denotes same values when we calculate the immigration surplus, but γ means the percentage change in the marginal product of labor or capital that derives from a percentage change in total product (assuming γ >0). The first term, as we are familiar with, indicates the initial immigration surplus, while the second term describes the increase in the value of natives' aggregate output that owes to external effects. (Borjas, 1994)

For instance, in using year 2000 data, if the elasticity of marginal product with respect to aggregate output (or γ) is 0.05, the external effects (or second term) will increase the national income that accrues to natives by 0.04 %, or 189.5 billion won. By adding the value of first term, the total contribution of foreign workers to native income will reach to 202.8 billion won. However, under this estimate, external effects cannot possibly recompense native workers' loss, caused by income transfer to capital owners of 2,044 billion won.

In the absence of any evidence supporting their existence and sizable magnitude, it is hard to say external effects positively affect the economic growth. On the contrary, adverse shocks can occur because using cheap labor of immigrants can sluggish industry restructuring. When unskilled labor and capital are substitutes, employers invest less in capital by using more labor. This tendency in the long run deteriorates capital stock. B. Lee and J. Kwon (1997) state that, in case of Seoul, guest workers are substitutes for capital esp. in textile industry. (Table 17) So, when employers avoid capital investment and use large share of labor, this relative dependency on labor makes the textile industry latent on restructuring and innovation. The whole industry gets to lose international competitiveness and its output market. At the end, the lower output will lead to lower employment both on immigrants and natives. But this symptom does not appear in chemistry and fabricated metal product. Whether external effects or adverse shocks they are, no significant proof is not yet disclosed how much they affect the labor market.

Table 17. Partial Elasticity of Complementarities by Three Manufacturing Industries in Seoul

Local Employment Opportunities

So far, we have discussed how the employment opportunities can be affected under the gross picture of whole national economy. But, we can imagine the case that some specific regions may be severely damaged in terms of overall wage level and job opportunities because immigration tends to be concentrated on several metropolitan and industrial areas. There are three views on the ways immigration can influence on the local employment opportunities.

Immigrant Inflow leads to Native Outflow

Borjas, Freeman and Katz (1996) conducted a U.S. regional comparison research in order to analyze the impact of immigration on wages. They tested, as the fraction of unskilled immigrants increases, what would happen on native wages controlling for age and education. The first cross-section impact of immigration between immigrant intensive and non-intensive areas says immigrant labor supply did not make a serious impact on the wage level of the equivalent natives. On the second test, they used first-difference regression analysis on immigrant intensive area. When wages for an area-education group were regressed, immigration induced large falls in pay. As the number of unskilled immigrants increased, native wages for high school dropouts decreased. What made these two test results different is the first static approach missed one important point that labor can move almost freely within a boarder.

When the unskilled immigrants arrive in a region, the increased labor supply lowers their wage level. But they can get much profit even by accepting lowered wages in a host country since they are from economically unfavorable countries with extremely low payment. The losers are, however, the natives. Because of decreasing returns on labor, they may choose not to work, or they will move to another region where the wage level is still high in the absence of immigrant arrivals. It is quite feasible because the mobility costs are low within a country. Information on available jobs is easily accessible within a border; where infrastructure on transportation and telecommunication is well built.

This probability is supported by a factor proportion analysis of the effects of immigration on native wages. The increase of unskilled labor leads to the wage falling among those who did not complete high school courses. (Borjas, Freeman and Katz, 1996) As labor supply increases, the wage for that group decreases. When the uprooted natives move to other regions and get jobs, they can recover the prior income in a new place. In a national dimension, the total wealth expands as more workers participate in production, but in reality the job opportunities for the natives diminishes with a tide of immigrant flow.

In the absence of empirical tests, the correlation between immigrant inflow and native outflow in a certain local area is not uncovered in Korea, but we can guess by enumerating two cases. Karibongdong in southern area in Seoul is named as little Yanbian (the north-east region of the Mainland where Chinese Koreans live together.). Some forty Chinese shops are opened on streets of five hundred meters, and 10,000 Chinese Koreans are supposed to settle down around there. Situated in Gu-Ro district, it was a traditional industrial area with plenty of low-income native workers for several decades. Taken into account less than a decade history of labor inflow from the Mainland China, it is astonishing change of labor composition. Another case is Ansan city, which is also typical industrial zone. In a so-called ‘Borderless Street’, people can find Chinese, Bangladesh and Philippine stores. Starting from 1997, 7,000 people from different nations have formed a small international society of the unskilled workers. Wongokbondong, the center of this society, had 30,000 native Korean residents before 1997, but now the number shrinks to 19,000. This native outflow is still going on. It is undeniable that, consistent with a ‘skating rink’ model of native location decisions for Borjas et al.; new immigrants may knock a native off the ice.

Immigrants Enhance the Natives' Opportunities

We remember from the end of second part in this paper that Mariel boatlift immigration flow did not lower the Miamians' wage level. That fact lets us to impose a hint on whether immigration does not deprive the natives of employment opportunities. The same Mariel case indicates these Cubans did not reduce the employment level esp. the unskilled jobs in Miami. One possible explanation is, as is discussed right before, the Mariels might displaced other workers to other places out of Miami. Card (1990) did not exclude this possibility, but he prefers the other explanation that the growth of labor-intensive industries facilitated the rapid absorption of the Mariel immigrants. The traditional immigration destinations like Miami usually contains immigrant-intensive industries like textile, food and beverage, or hotels and motels that require large number of the unskilled or intermediately skilled workers. Due to the specific industrial structure, on the arrival of massive labor force, Miami was already prepared to receive them.

As the dual labor market structure suggests, SMEs in Korea have needed cheap, unskilled labor for more than a decade. Whether it is caused by either demand or supply factors, Korean labor market has been ready to accept the new labor force. Both Karibongdong in Seoul and Wongokbondong in Ansan have many SMEs. We can now turn our previous assumption to other direction. Immigrants may not expel the natives from the regions, but they fulfill these places; otherwise, being vacant. Contrary to the previous argument by Borjas et al., a recent research finds, from Censuses on 119 U.S. metropolitan statistical areas in 1970, 1980, and 1990, the increase in immigrants in a certain skill level initiates small *increase* in the population of the natives of the similar skill group. (Card and DiNardo, 2000) They conclude unskilled immigration inflow is absorbed as the industry structures rapidly adjust themselves to the changed number and skill composition of local

labor force. When the immigrants get more hired, it probably leads to more employment among the natives due to the weak but definite complementarities between the two groups.

Immigrants and Natives Have Their Own Job Markets

The last local model is based on sociological findings. Contrary to the first one, this assumes labor markets are spatially closed by local experience and place-based knowledge. Once a first group of immigrants arrives in a specific place, they take part in that local economy by having jobs most available for their skills. Since immigrants are ignorant on information in the host country, they can only retain knowledge on their local market and their first types of jobs. This limited information goes back to the sending country through the nexus of families and friends; second or third waves of immigrants start to move in that specific regional market, just like did Koreans in Los Angeles, Chinese in San Francisco and Puerto Ricans in New York in the U.S. Then, the number of immigrants becomes large enough to establish an ethnic community where closure is strengthened. But as the closure limits their contacts with outsiders, same group of immigrants routinely participate in similar kinds of work that their first comers used to do even when market conditions in a host country changes along time. A significant minority society builds a labor market, different from that for the natives, which usually but strangely ends up with low returns on human capital. (Sassen, 1995)

Similar cases can be noticed in Korea as well. Chinese Koreans in Karibongdong and Bangladesh and Pakistanis in Ansan will be a good example in another way. It is not the same case, but, for example, Philippines gather every Sunday in Hewha Cathedrale in Dongsungdong, Seoul, and open flea markets of Philippine products. They are supposed to share information on jobs and wages, and most of job change

decisions are made in each ethnic community. According to a 1995 survey on job decisions among 185 foreign workers in Korea (Seol, 1999), around 52% workers get an information on the current job from compatriot friends, relatives or agencies, while the rest through Koreans they know. But the interesting point is that the longer they stay in Korea, they heavily rely on their friends (66%), not on job agencies (13%). This means immigrants in Korea use local and informal network of information and communication for their economic activities.

Since immigrants respond to their own systems of job decisions, native local market conditions do not affect the immigrants' flow. Thus, immigrants can get the jobs even where native unemployment level is high, and in declining industrial areas. (Sassen, 1995) From this argument, we can deduct that immigrants and natives can conflict for the same jobs by chance, but immigrant inflow does not mostly influence on the natives' employment as well as wages because they compete for certain jobs among themselves. An empirical study on foreign workers in Seoul (B. Lee, 1995) provides another feedback that foreigners are significantly strong substitutes for other foreign workers, not for the natives, esp. in SMEs. (Table 9.)

But we cannot easily conclude which model is right, since local labor market responses on immigration are multifaceted, so the three models are also partially true. Moreover, there are many different kinds of theories and models on this issue. But except the first one- immigration inflow leads to native outflow- the other models agree on that immigration does not greatly reduce the natives' job opportunities. Sociology stresses much on social behaviors of different groups, but economics concentrates on that segmented labor structures and subsequent economic expansion allow positive impacts on both immigrants and natives.

Conclusion

Summary

Throughout the whole paper, we found out that labor inflow in Korea has expanded over a decade. The increase of unskilled immigrants, who are composed of trainees and illegal workers, has dramatically exceeded that of skilled ones during the 1990s. Mostly coming from underdeveloped, other Asian neighborhood, they work in small, manufacturing factories where native Koreans no more want to work.

In the following part, immigration surplus in Korea was estimated under the Borjas' theoretical framework, and found that 1% unskilled labor import has contributed to a bit less than 0.002% increase in GDP in the latter half of the 1990s. This small impact results mostly from low percentage of immigrant presence in Korean labor market. If their portion increases, foreigners will bring larger surplus because of high elasticity of factor price for labor. Even though there are some disputes on desirable level of immigrants' skill or the effect of income redistribution, it is agreed that immigrants play an important role in economic activities.

On the examination of immigration impact on natives' employment opportunities, we cannot easily conclude which model is more close to the real picture of current Korean labor market, but many models agree on that immigration does not greatly reduce the natives' job opportunities. Economic theories strongly suggest that segmented labor market structures and after-immigration economic expansion can predict positive impacts on both immigrants and natives.

All these observations depict Korea is being transformed into multinational society, and this wave seems not to be held back any more. Due to the short history as an immigrant destination, the strong presence of immigration surplus is not well detected; however, we can expect this kind of benefits to be enlarged, as immigrants constitute a sizeable pillar of Korean economic activities. This finding, therefore, suggests the further policy implications on Korean immigration policies.

Korean Government Policies on Foreign Workers

Current Situations

In Korea, there is no legally admitted employment except in reporting, business, technology transfer, capital investment, education and research, and entertainment. The unskilled immigrants are either trainees in Industrial trainee program or illegal workers. When unskilled labor first started to enter around 1987, Korea had no policy on them, but, since 1994, the Program has been in practice. There have been frequent changes on the size of trainees, the length of training period, and employers' qualifications such as firm size, targeted business sectors or others. At any rate, guest workers arrive in Korea throughout 45 agencies in 14 sending countries to work in SMEs for two-year period. Korea Federation of Small Business (KFSB) takes whole processes from importing to sending them back through its affiliated Alien Training Cooperation Corps (ATCO). Moreover, in 1998, Trainee Employment System was enacted so that, after two year training and examination, foreigners are eligible to be a legally standardized 'worker' for a subsequent year.

But the new Trainee Employment System does not work well, since immigrants have no enough time to prepare the difficult qualification exams. Only 23% of the eligible trainees from 2000 to September 2001 passed the exam and could stay for one more year. However, more serious problem lies in KFSB imposes too low wage rate on foreign trainees- 56% level compared to native workers in 1995, for instance. They try to exploit labor in a cheap price, and lower total costs of production to retain the international price competitiveness of products. Another problem is that training period is too short. Foreigners pay sizeable money to be a trainee, but two year training and low wages deter them from earning substantial profits they initially imagined. Thus, trainees leave their work places illegally to find other plants that offer higher returns for work. The firms who cannot afford the trainees due to the lack of entitlements, for their part, eagerly accept them even by offering higher wages to fulfill labor shortage. So, as illegal workers earn outstandingly more money (Table 18), more trainees give up their legal status in expense of higher returns, and actually 42.3% trainees did in 2000.

Table 18. Immigrant Wages by Legal Status in 1995 (Won)

	Monthly Wages
Korean Origin, Illegal Workers (N=104)	829,608
Other Illegal Workers (N=221)	574,829
Trainees (N=68)	310,043

Source: Uh and H. Kwon, 1995 N= Number of responses

But it should be remembered that illegal workers can be exposed to late or non-payment and violence, since they are out of legal protections. Unfortunately, these cases are reported frequently. The immigrants' human rights issues are really concerned let alone bad reputation for Korea in an international scene.

Policy Implications

Even though net wages that trainees receive is small, getting a trainee costs about 80% of employing a native worker, according to Korea Labor Institute's research in 1996. Employers pay some fees to KFSB in order to get trainees, and they provide meals and places to sleep because trainees are *de jure* invited in companies to acquire new skills and familiarize themselves with advanced technologies. On the abolition of Industrial trainee program, employers could dramatically cut these non-wage costs. When unskilled foreigners are approved as entitled workers, the social security benefits, accrued to them, may soar up to the equivalent natives' level, but the reduced non-wage costs can offset these. Under the possibility that immigration surplus can exist even when immigrants and natives receive same amount of money, we can expect all the natives and foreign workers, and capital owners can get benefits from the legislated, unskilled labor import.

Therefore, current government-level discussion on a new employment system for foreign workers may cure the existing labor problems. Ministry of Labor tries to implement a new law by allowing companies to hire directly foreign 'workers' for three years. Under the intended system, Ministry of Labor will issue working permits to foreigners in cooperation with the Ministry of Justice. They will get paid as much as the natives, and even be fully protected by Korean labor laws. But, when it is drafted at the end of June 2002 as scheduled, the size of surplus will not be greatly expanded since the size of entry quota is restricted to 1-1.5% of domestic labor force. Under the current or new system, however, foreigners can only stay two or three years in workplace. It is too short for employers as well because workers return to their country when they are accustomed to their work and working conditions. The longer they stay, the higher their productivities will be.

Of course, there are negative aspects on opening unskilled labor immigration. If the share of immigrants is growing enough to form a sub society, it may harm the cooperation among workers or the whole social cohesion due to some intercultural misunderstandings or inter-group tensions just like Western economies have experienced. In extreme cases, the social agitation and instability may slow down the economic development. Moreover, immigrants also can be free riders in social security systems. For example, when a foreign ‘worker’ loses a job, he/she can eligibly receive unemployment insurance. However, well-devised immigration policies may minimize these side effects. Quota system, as is now devised, can block the increasing rate of immigrants. Anyway, under the labor standards, foreign workers can be protected from exploitation; in turn, they can pay back some of their wages by taxes to build social securities for their own and Korean co-workers.

Lots of discussions, including this paper, have talked about the pros and cons on accepting foreign labor. But there are limits to measure the social impact by using one or two economic models. It is time to conduct an extensive, nation-wide research to calculate the multifaceted, socio-political economic surplus of immigration in order to adequately respond to a rapidly internationalizing Korean society and needs for transnational labor flows.

Appendix

Table 2. Foreign Workers by Legal Status, 1987-2000 (person, (%))

	Total	Formal	Trainee	Illegal*
1987	6,409	2,192 (34.2)	-	4,217 (65.8)
1988	7,410	2,403 (32.4)	-	5,007 (67.6)
1989	14.610	2,474 (16.9)	-	12,136 (83.1)
1990	21,235	2,833 (13.3)	-	18,402 (86.7)
1991	45,449	2,973 (6.5)	599 (1.3)	41,877 (92.2)
1992	73,868	3,395 (4.6)	4,945 (6.7)	65,528 (88.7)
1993	66,323	3,767 (5.7)	8,048 (1.2)	54,508 (93.1)
1994	77,546	5,265 (6.8)	24,050(31.0)	48,231 (62.2)
1995	142,405	8,228 (5.8)	52,311(36.7)	81,866 (57.5)
1996	210,494	13,420 (6.4)	68,020(32.3)	129,054(61.3)
1997	245,399	15,900 (6.5)	81,451(33.2)	148,048(60.3)
1998	157,689	11,143 (7.0)	47,009(29.8)	99,537 (63.2)
1999	217,384	12,592 (5.8)	69,454(31.9)	135,338(62.3)
2000	284,145	17702 (6.2)b	77,448(27.3)	188,995(66.5)

b: including E-8 (Trainee employment) visa holders

*The size of Illegal workers is calculated by estimating illegal foreign residents in Korea

Source: Annual Report on Embark- and Disembarkation, Ministry of Justice, Korea, each year

Table 3. Nationality, Brotherhood of Foreign Workers, 2000 (Top 10)

Nationality	Total	Trainee		Illegal	
		Korean 1)	Non-Korean	Korean	Non-Korean
China	125,706	11,423	17,237	57,348	38.277
Philippine	22,870	0	7,498	0	12,890
Indonesia	18,967	0	15,273	0	3,191
Vietnam	18,398	0	10,170	0	7,772
Bangladesh	17,651,	0	2,985	0	14,475
Thailand	14,936	0	2,417	0	12,449
Mongolia	13,562	0	412	0	13,088
Uzbekistan2)	8,756	0	3,448	0	4,933
Pakistan	7,992	0	1,891	0	6,054
Sri Lanka	3,112	0	1,334	0	1,744
Total	251,950	11,423	62,665	57,348	114,873

* including formal workers 1) 'Korean' indicates Korea origins 2) Uzbek-Korean not separately counted

Source: Annual Report on Embark- and Disembarkation 2000, Ministry of Justice, Korea,

Table 4. Foreign Trainees on Each Size of Firms, 1995

Size of Firms (Number of employees)	Trainee	
	Number	Percentage
1-5	79	0.2
6-10	1,081	3.8
11-20	2,092	7.4
21-50	7,929	28.3
51-100	8,227	29.4
101-200	5,470	19.5
201-300	1,578	5.6
Over 300	1,525	5.4
Total	27,981	100.0

Source: Korea Federation of Small and Medium Business, 1995

Table 5. Illegal Workers on Each Size of Firms, 1995 (%)

Size of Firms (N. of employees)	Total	Illegal Worker	
		Korean 1)	Non-Korean
1-4	4.8	17.1	5.0
5-9	16.7	26.8	22.1
10-29	40.6	31.7	54.8
30-49	6.7	2.4	9.0
50-99	9.2	12.2	4.5
100-299	18.7	7.3	4.5
Over 300	3.3	2.4	-
Total	100.0	100.0	100.0
N. of cases	201	40	161

1) 'Korean' indicates Korea origins

Source: Seol, 1999 (edited)

Table 6. Employment by Industries, 1995

Industry	Trainee		Illegal Worker	
	Persons	Percentage	Persons	Percentage
MANUFACTURING	27,981	100.0	8,984	98.2
Food and beverage, tobacco	0	0.0	n.a.	n.a.
Textile, wearing, footwear	13,100	46.8	2,890	31.6
Wood and wood products	257	0.9	896	9.8
Paper, printing	970	3.5	-	-
Chemicals, plastic products	3,245	11.6	1,159	12.7
Non-metallic mineral products	802	2.9	-	-
Basic metal products	1,028	3.7	n.a.	n.a.
Fabricated metal/ Machinery	7,824	28.0	1,949	21.3
Furniture	755	2.7	n.a.	n.a.
Other manufacturing industries	-	-	2,090	22.9
Construction	0	0.0	161	1.8
Construction	0	0.0	161	1.9
Total	27,981	100.0	9,145	100.0

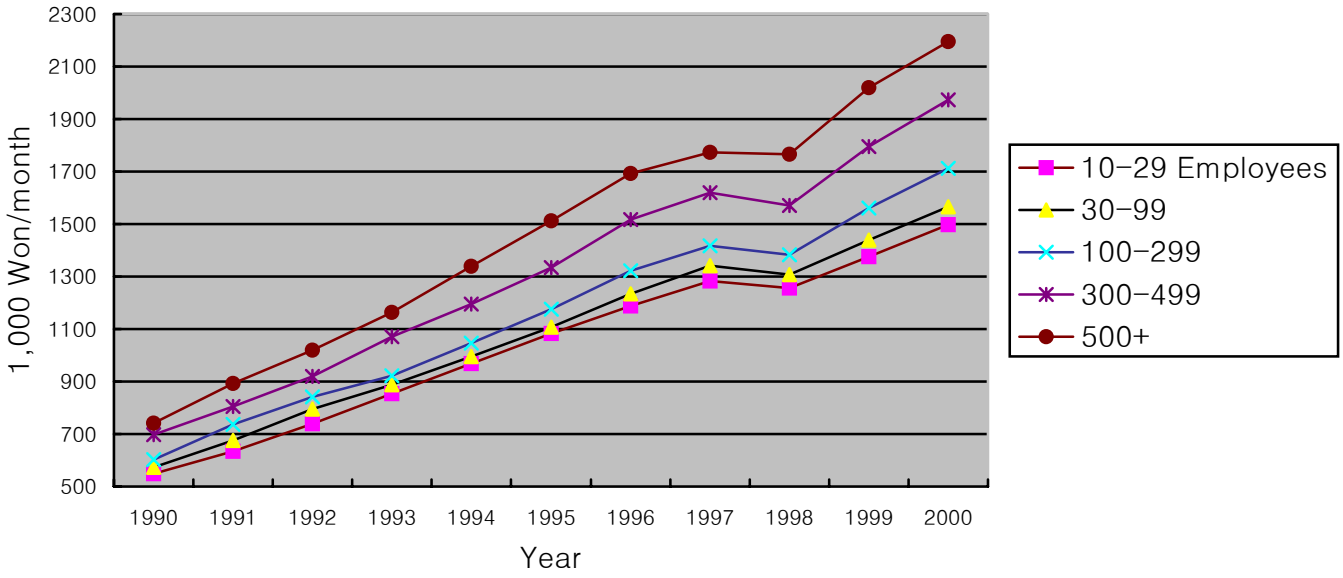
Source: Seol, 1999 (edited)

Table 9. Partial Elasticity of Complementarities in Three Manufacturing Industries in Seoul by Firm Size

Total	M, S	F, S	M, U	F, U	Foreigners	Capital
Male, Skilled (M, S)	6240+					
Female, Skilled (F, S)	-0.205+	-14**				
Male, Unskilled (M, U)	-25000+	1.27	100000**			
Female, Unskilled (F, U)	-1.07+	5.26**	-2.84	-39.7**		
Foreigners	0.34+	2.58**	-0.443	3.6*	-30.5**	
Capital	-323+	0.781**	1290**	0.59*	0.827*	16.6**
Lee than 100 workers	M, S	F, S	M, U	F, U	Foreigners	Capital
Male, Skilled	6088.76+					
Female, Skilled	0.293+	-14.5**				
Male, Unskilled	-24400+	4.32*	97800**			
Female, Unskilled	0.35+	1.41*	1.49	-47**		
Foreigners	0.895+	1.12	0.891	1.22	-31.3**	
Capital	-315+	0.922**	1260**	0.963	0.955**	16.2**
Less than 50 workers	M, S	F, S	M, U	F, U	Foreigners	Capital
Male, Skilled	6960+					
Female, Skilled	0.375+	-17.8**				
Male, Unskilled	-24400+	8.7**	85200**			
Female, Unskilled	0.393+	1.39	3.74*	-47.2**		
Foreigners	0.886+	1.18*	1.17	1.2	-31.2**	
Capital	-324+	0.86**	1140**	0.939**	0.946**	14.9**

Source: B. Lee (1995) ** 99% significance level, * 95%

Figure 6. Wage Level by Establishment Size



Source: The Profile of Korean Human Assets, KLI, 2001

Table 15. How Employers Respond to Labor Shortage by Industries (responses, (%))

	Retired Natives	Foreign Workers	Active Natives	Others	Total
Beverage, Food	6	22	14	1	43
	(14.0)	(51.2)	(32.6)	(2.3)	(100.0)
Textile	5	14	6	1	26
	(19.2)	(53.9)	(23.1)	(3.8)	(100.0)
Non-Metallic Products	4	12	7		23
	(17,4)	(52.2)	(30.4)		(100.0)
Metal Products	3	17	2	1	23
	(13.0)	(73.9)	(8.7)	(4.4)	(100.0)
Wood and Paper	3	8	10	2	23
	(13.0)	(34.8)	(43.5)	(3.3)	(100.0)
Chemicals	3	34	21	2	60
	(5.0)	(56.7)	(35.0)	(3.3)	(100.0)
Machinery and Electronics	5	23	11	1	40
	(12.5)	(57.5)	(27.5)	(2.5)	(100.0)
Others	7	12	9		28
	(25.0)	(42.9)	(32.1)		(100.0)
Total	36	142	80	8	266
	(13.5)	(53.4)	(30.1)	(3.0)	(100.0)

Source: Song, KIET, 1999

Table 17. Partial Elasticity of Complementarities by Three Manufacturing Industries in Seoul

<Textile>	M, S	F, S	M, U	F, U	Foreigners	Capital
Male, Skilled (M, S)	-10.4*					
Female, Skilled (F, S)	0.865*	-9.48**				
Male, Unskilled (M, U)	1.22	3.69	159000*			
Female, Unskilled (F, U)	0.658	1.76	0.797	-29.1		
Foreigners	3.9+	4.88+	-99800+	10.6+	50900+	
Capital	0.791**	0.717*	1870*	0.435**	-710+	3.3*
<Chemistry>	M, S	F, S	M, U	F, U	Foreigners	Capital
Male, Skilled	90000+					
Female, Skilled	2.2+	-33.7**				
Male, Unskilled	-18000+	0.311	36200*			
Female, Unskilled	1.82+	-0.597*	1.36	-95.1*		
Foreigners	2.14+	-0.409*	1.69	3.06*	-45*	
Capital	-429+	1.00	853*	0.875*	0.804*	20.5*
<Fabricated Metal>	M, S	F, S	M, U	F, U	Foreigners	Capital
Male, Skilled	7920+					
Female, Skilled	0.535+	-46.60*				
Male, Unskilled	-40200+	-4.46*	161000*			
Female, Unskilled	-0.451+	1.59	-3.72*	-301*		
Foreigners	0.0574+	1.76*	-1.38**	2.25	-94.3*	
Capital	-428+	1.05**	1940*	1.07*	1.05**	23*

Source: B. Lee (1995) ** 99% significance level, * 95%

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<Electronic Resources>

Korea Federation of Small Business http://www.kfsb.or.kr/

Ministry of Justice, Immigration Bureau http://www.moj.go.kr/immi

Ministry of Labor/ statistical database http://www.molab.go.kr/

National Statistical Office/ statistical database http://nso.kosis.go.kr/