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Education and Labor Market Performance of Immigrant Workers

- Focusing on Different Education Effects by Country of Origin -

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Abstract

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As the influx of immigrants is steadily increasing, public opinion is growing that immigrants with a higher level of human capital should be attracted instead of low-wage, non-professional workers who have been making up the majority of immigrants in Korea. Nevertheless, there is a lack of in-depth analysis of differences in labor market performance by country of origin and educational level as well as discussion on the effectiveness of selective immigration policies.

This study analyzed the rate of return to education by classifying foreign wage workers into three groups of origin: OECD, non-OECD, and Korean Chinese. In addition, the same analysis was conducted by dividing the professional visa holder group to which the selection policy was applied and the other visa holder group. As a result of the analysis, the average wage of OECD workers was about 50% higher than the other two groups, and the rate of return from an increase in one year of education is more than four times higher than the other two groups. The rate of return

for non-OECD workers and Korean Chinese was similar at 1%, but the average wage for Korean Chinese was 6% higher. By visa group, the rate of return to education for the professional visa group that went through the selection process was significantly higher than that of marriage immigrants or non-professional visa holders. In addition, OECD workers receive 30-60% higher wages on average than non-OECD workers in all visa groups.

These results are consistent with the results of previous studies that immigrants educated in developed countries show better labor market performance, and support policy approaches that consider educational attainment in developed countries as a positive factor. This result also supports the further application of selective immigration policy considering the level of education, as the labor market performance of the group that has undergone the selection process is superior to that of the group entering without such a vetting process.

Keywords: immigration policy, selective immigration, education effect, rate of return to education

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Chapter 1. Introduction

1.1. Background

Korea already entered an aging society in 2017, and the rate of demographic change is the fastest among developed countries. According to the forecast of Statistics Korea in 2020, the number of people aged 65 and older, or the elderly population in Korea, is expected to more than double over the next 20 years, from 8.03 million in 2020 to 16.66 million in 2040. Accordingly, the proportion of the elderly population in the total population is expected to reach 34% in 2040, from 16% in 2020. Meanwhile, the working-age population (15-64), which forms the core axis of the economy, will decrease by more than 23% from 35.79 million in 2020 to 28.65 million in 2040, and the proportion over total population is expected to drop sharply from 71% to 55% during the same period.

This rapid decline in the working-age population leads to insufficient supply and excess demand in the labor market. Borjas (2014) has stated that immigration can contribute to market efficiency by coordinating excess supply or excess demand in the labor market between countries. Therefore, the rapid increase of the aged population and decrease of the working-age population can be factors that attract immigrants to the domestic labor market. In reality, the number of foreigners residing in Korea has steadily increased over the past 10 years, from 1.4 million in 2011 to 2.43 million in 2019. Excluding foreigners temporarily staying for tourism purposes, the number of foreigners allowed to work in Korea in the past 10

years has increased by nearly 45% from 930,000 to 1.35 million. As the number of long-term foreign residents engaged in economic activities increases, there are growing concerns that those foreign workers will take the job opportunities of nationals away and worsen overall working conditions.

Most of the advanced countries facing similar situations, including Germany and Japan, try to prevent negative effects on the labor market by limiting the inflow, the length of stay, and the total number of non-professional workers with low skill levels and high substitutability in the labor market. On the other hand, various incentives are provided to promote inflow and stay of foreign professional workers with high levels of human capital. Although the Korean government has been taking similar policy approaches, the reality is that most foreign workers currently in Korea belong to non-professional groups. Different interests among stakeholders make things more complicated; the industry complains about the shortage of manpower and advocates for the introduction of additional foreign workers, while labor unions argue that the inflow of foreign workers has a negative effect particularly on the vulnerable groups in the labor market.

In the midst of such conflicting voices regarding foreign employment, it is important to implement an evidence-based policy with analysis of the current labor market situation. In particular, it is necessary to systemically analyze the human characteristics of foreign workers in the domestic labor market based on wage structure, which is an indicator of the labor market performance of foreigners. With this work, it is possible to minimize the negative impact on the vulnerable groups and implement policies that identify the foreign workers creating high added value and give preference to them.

1.2. Research Purpose

One of the policy tools used to evaluate the human capital of foreign workers is examining educational attainment. Indeed, educational attainment is a widely acknowledged indicator of human capital in the process of immigration selection. The Korean government also examines, although limited, whether foreign candidates who want to enter the country have adequate education when issuing visas to professional workers. Since the level of education and the quality of education differs from country to country, it is likely that different standards for evaluating the academic background are applied based on the country where the education was obtained. Nevertheless, under the current employment visa selection system, this differentiated approach is hardly recognizable and only for certain limited visa types to which differentiated requirements are applied considering candidates' country of origin.

This policy approach is based on the assumption that foreigners with higher education levels have higher human capital, regardless of their country of origin. Given that the level of education differs across countries, particularly between developed and developing countries, it can be said that a higher level of education is not necessarily associated with a higher level of human capital and better labor market performance. Also, whether immigrants are subject to selection process to evaluate the education level may affect the association between education and labor market performance.

This study will analyze the wage structure of foreign workers who have entered the Korean labor market. In particular, this study will examine the

differences between foreign workers from developed countries in OECD (The Organization for Economic Cooperation and Development) and foreign workers from non-OECD countries in the labor market. Furthermore, the study will examine the differences in the effects of education (rate of return to education) by country group. Korean Chinese, who account for the majority of foreign workers, will be examined separately from other general non-OECD nationals. Additionally, this study will examine whether this source country effect differs by visa type to determine whether immigrants who are selected with their educational attainment actually show the higher return from education. Finally, synthesizing the results of this analysis, this study will draw policy implications and recommendations to promote the effectiveness of selective immigration policy.

Chapter 2. Policy Framework and Literature Review

2.1. Foreign Employment Policy of Korea

2.1.1. Foreign Workers in Korea: Overview

According to Statistics Korea, as of 2020, there are about 848,000 foreigners currently working in Korea. This figure excludes illegal immigrants, and it is reasonable to assume that most of illegal immigrants (392,000 as of December 2020) are engaged in economic activities, it can be said that about 1.24 million are employed. This is equivalent to about 5% of the total employed workers: 26.52 million.

Comparing the labor force participation rate, the labor force participation rate of foreigners is 69%, which is quite different from that of Koreans at 61%. There is a sensible explanation for this; a significant number of long-term foreigners in Korea are foreigners who are authorized to work legally, and in the case of a work visa (E group visa), it is possible to enter and stay in Korea when an employment contract is concluded with a domestic company. Therefore, it is natural that the participation rate of foreigners is higher than that of these Koreans.

Table 1. Number of foreign workers: by visa type (unit: 1,000)

Non-Professional (E-9)	**251.1**	29.6%	**Overseas Koreans* (F-4)**	**205.1**	24.2%
Overseas Koreans* (H-2)	**117.2**	13.8%	**Permanent Resident (F-5)**	**79.7**	9.4%
Professionals (E-1~E-7)	**38.7**	4.6%	**Marriage Migrant (F-6)**	**61.9**	7.3%
Students (D-2, D-4)	**27.2**	3.2%	**Others**	**66.9**	7.9%
Total	**847.9**	100%			

* Note: H-2 visa holders are allowed to work in low-skilled sectors, while F-4 visa holders cannot work in the low-skilled sectors unless permitted

(Source: Statistics Korea, 2020)

The composition of foreign workers is shown in the table above. Excluding illegal immigrants, the largest proportion of foreign workers are workers with Korean visas (F-4 and H-2). (330,000 people, 38%) Most of the foreigners holding this visa are Korean Chinese, and those who entered the country from three Northeast autonomous regions after diplomatic relations between Korea and the People's Republic of China (PRC) were established in 1992.

The next largest share is non-professional visa (E-9) workers introduced under the Employment Permit System (EPS). (250,000 people, approximately 30%) Currently, the Korean government has agreements with 16 countries (Philippines, Mongolia, Sri Lanka, Vietnam, Thailand, Indonesia, Uzbekistan, Pakistan, Cambodia, PRC, Bangladesh, Nepal, Kyrgyzstan, Myanmar, East Timor, Laos) to introduce foreigners into low-skilled industries.

For managers and high-skilled workers engaged in professional fields, one of the visas from E-1 to E-7 is issued depending on the field of work. The proportion of professional workers is relatively low, approximately 5% of total immigrant workers. Although attracting foreign talents has been the top policy priority of the Korean government, the OECD points out that it is highly likely that the incentive for high-quality manpower to enter and stay in Korea is insufficient rather than a matter of immigration formality such as visas. (OECD 2019)

In addition, 16% are permanent residents (F-5) and marriage migrants (F-6) who do not have restrictions on employment activities. In addition, about 5% of those who fall under miscellaneous visa (G-1), which include refugee applicants and temporary residents for humanitarian reasons.

Next, the foreign employment sector by industry: 60% of all workers are concentrated in the manufacturing, mining, and construction sectors where non-professional workers are employed. Next, 36% are employed in the service industry such as wholesale and retail and accommodation, 7% in agriculture and fishery, and 3% in other industries. This is supported by the fact that most Korean visa (H-2) holders and non-professional workers (E-9) are employed in the manufacturing or service industries.

Lastly, the wage distribution among foreign workers: it is found that 80% of foreign workers earn less than 2.5 million won per month, and 50% of them earn 2 million won per month. According to Statistics Korea, as of 2019, about 54% of those with an average monthly wage of less than 2.5 million won in the domestic labor market. Therefore, it can be said that this statistic is in line with the conventional thinking that foreign workers are mainly employed in low-wage jobs.

2.1.2. Foreign Employment Policy Programs and Visas

Korea's employment-related programs for foreigners can be broadly divided into programs for Koreans and programs for foreigners in general. Looking at Table 2 below, there are 15 types of work visas for foreigners who are allowed to work for a long term (more than three months) in Korea.

Table 2. Types of major employment visas

Professional (7 types)	
Professor (E-1)	Engage in education or research, guidance of the professional field at educational institutions of higher than the college level or equivalents
Language Instructor (E-2)	Engage in teaching conversational language at a foreign language institute
Researcher (E-3)	Engage in research and development of advanced industrial technology or natural science field at research laboratories
Technical Instructor (E-4)	Engaging in teaching professional knowledge of natural science or technology guidance
Certain Professionals (E-5)	Engaging in professional work in legal, accounting, medical and other fields with professional certificates authorized by relevant agencies
Artist Sportsperson (E-6)	Engaging in activities such as music, fine arts, professional sports, or other professional entertainment activities.
Certain Occupations (E-7)	Engage in professional fields designated by the Minister of Justice
Non-professional (4 types)	
Seasonal Employment (E-8)	Engaging in seasonal employment program in agriculture, fisheries with the invitation of local municipal governments.
Non-professional -EPS (E-9)	Non-professional workers introduced under EPS program, engaging in manufacturing, construction, agriculture, and service (limited) jobs.
Overseas Koreans (H-2)	Engaging in manufacturing, construction, agriculture, and service jobs with labor permits
Maritime Workers (E-10)	Non-professional crews or assistant working in vessels of coastal shipping, fishing, and cruise

Other Employment Visas (4 types)	
Overseas Koreans (F-4)	Overseas Koreans with foreign nationalities engaging in professional jobs with labor permits (only professional jobs)
Resident (F-2)	Dependents of permanent residents or equivalents, certain professionals, investors, and high-skilled workers
Permanent Resident (F-5)	Permanent residents
Marriage Migrant (F-6)	A person with valid marital status in Korea

Among these visas, E-1~E-7 visas are generally considered professional worker visas. Seasonal employment (E-8), Non-professional workers under the EPS program (E-9), Overseas Koreans (mostly low-skilled workers) (H-2), and Maritime workers (E-10) are classified as non-professional workers. In addition, Permanent residents (F-5), Marriage migrants (F-6), and Overseas Koreans (other than low-skilled workers) (F-4) visas are classified as 'Other' employment visas. There is a fundamental difference between the E group visa and the F group work visa in terms of policy backgrounds and legal rights to access the labor market: the employment permit system (E group visas) or labor permit system (most F group visas and H-2).

a. Employment Visa System for Overseas Koreans

The increase in the number of foreigners residing in Korea shows the same trend as the increase in the number of overseas Koreans living in Korea. According to the Ministry of Justice, out of 55,832 foreigners residing in Korea in 1992, 444 foreigners were overseas Koreans, less than 1%. With a relaxation of visa requirements for overseas Koreans over decades, the number of foreigners of overseas Koreans living in Korea

continued to increase, reaching a total of 101,000 (20%) in 2000 and 477,000 (38%) in 2010. As of the end of 2020, there are more than 0.81 million overseas Koreans in Korea, accounting for 40% of all foreigners (Table 3).

The group of overseas Koreans residing in Korea can be broadly divided into those from PRC, Russia and the Commonwealth of Independent States, and other regions such as the Americas. Among them, the largest share is Korean Chinese, accounting for more than 80% of the total number of foreigners residing in Korea, accounting for 662,000. Those from Russia and the former Soviet Union account for about 10%, and those from other regions such as the Americas account for the remaining 10%.

This sharp increase is due to the regulatory easing done by the Korean government in line with the end of the Cold War and formal establishment of a diplomatic relationship between Korea and PRC. Underlying this policy approach is the view of overseas Koreans with foreign nationality as a member of the ethnic community, as many Koreans have been displaced amid the Japanese colonial rule and the subsequent political division of the Korean peninsula and warfare. In this context, overseas Koreans have been invited and grown into a major constituent group.

The H-2 or F-4 visa currently granted to overseas Koreans has several advantages compared to the general foreigner visa: 1) Work permit system 2) Allows employment in a number of industries and occupations.

In general, general foreign workers are strictly restricted in the type of job or industry depending on the type of visa, and, except for professional workers, must leave the country in principle when the employment contract with the employer that provided the sponsorship is canceled. On the other hand, overseas Koreans do not need to leave the country even if the labor contract is canceled, and they can stay in Korea continuously even if they change their place of work with a simple report. In other words, the intensity of regulations on employment activities for overseas Koreans is much less than that of general foreign workers.

b. **Employment Visa System for General Foreign Workers**

The Korean government regulates the employment of ordinary foreigners based on the employment permit system, which requires employer sponsorship as a basic principle. In this context, the 'employment permit system' does not mean a specific policy program for non-professional workers (EPS), but rather the system as a contrast to the 'work permit system' applied to permanent residents and overseas Koreans.

Under the employment permit system, foreign workers can only be invited and hired in Korea provided that the employer who hires them meets the requirements. Only foreigners who have been invited in this way can enter the domestic labor market. On the other hand, under the work permit system, foreigners who meet certain qualifications are allowed to work, but an employment contract with an employer is not a prerequisite for visa application. Therefore, under the work permit system, there is no

need for a sponsorship from the employer or the conclusion of a labor contract in advance.

The work permit system is generally said to be a much weaker regulatory framework for foreign employment than the employment permit system. Particularly, under the employment permit system, the government usually focuses on the evaluation of the employer (the workplace environment, working conditions, compliance with relevant labor laws, etc.) rather than the human capital of foreigners. On the other hand, under the labor permit system, whether to allow entry into the labor market is mainly determined according to the qualification of the foreigner and the level of human capital.

The Korean government is applying a strict employment permit system for non-professionals, and a relaxed employment permit system and work permit system for professionals. Specifically, when a non-professional worker changes his/her workplace, the new employer must obtain permission from the authorities in advance, and the foreigner must also obtain permission in advance. On the other hand, professional personnel only need to report post-employment even if they change their workplace.

In contrast, the professional employment visa policy focuses on the following principles. (1) Simplification of procedures – Reduce administrative procedures required for visa issuance and employment so that companies can easily introduce professional foreign workers and

facilitate entry into Korea through electronic clearance (2) Support for settlement – High wages and high wages encourage people with the high educational background to more easily obtain work permits and obtain permanent residency.

Recently, the government has newly established a job-seeking visa track that allows you to work in Korea without a labor contract and a visa track that allows you to obtain work permits and long-term residence permits without any special requirements if wages are high. These are all point-based system visas, which reveals the policy goal of making it easier for potential foreign talents to enter Korea.

Next, regarding policies for non-professionals, EPS is a representative. EPS is a non-professional foreign worker employment program that Korea has been operating since 2003. EPS started with a critical reflection on the Industrial Trainee System. The Industrial Trainee System was introduced in 1991 by the 'Small and Medium Business Cooperative Association', which is a small and medium-sized business employers' organization, not the government, managing the recruitment and employment process of foreign non-professional workers. As many of these trainees suffered from excessive sponsorship fees and labor rights abuses, the government introduced EPS, as a government-led non-professional foreign worker inviting scheme.

When the Korean government first introduced EPS on a pilot basis in 2003, it was based on the following five principles: (1) Subsidiarity –

deploying foreign workers in sectors experiencing serious difficulties in hiring Koreans so as not to encroach on local jobs (2) Transparency – Transmission Direct management by the public sector to suppress corruption (3) Respect for market demand – Introduction based on market demand (4) Short-term cycle – Prevention of settlement of non-professional workers (5) Prohibition of discrimination – treating foreign workers on an equal basis with native workers when applying relevant laws.

However, there are growing concerns over EPS with several problems. Specifically, the persisting issue of overstaying of non-professionals, information asymmetry, and inefficiency issues attributed to the ineffective matching system are constantly being raised. Contradicting its core principle, the employment period for non-professionals has been continuously extended from 3 years to a maximum of 10 years. This is inconsistent with the goal of a 'short-term cycle' and studies suggest that this may negatively affect native workers' access to the labor market and EPS workers can be substitutes for Korean low-skilled workers. (Choi et al 2015, Kim 2018). Moreover, there is a significant number of people seeking to remain in Korea by applying for marriage migrant status or refugee status.

If undesirable settling of low-wage workers persists beyond policy capacities, it may inevitably incur social conflicts and costs due to the increase in the low-wage and low-skilled group in the labor market. The government is trying to grant long-term stay visas selectively to skilled and high-wage workers. However, the number of EPS workers staying over the

expected period, through various methods such as illegal stay, marriage, and other ways is expected to continue to increase.

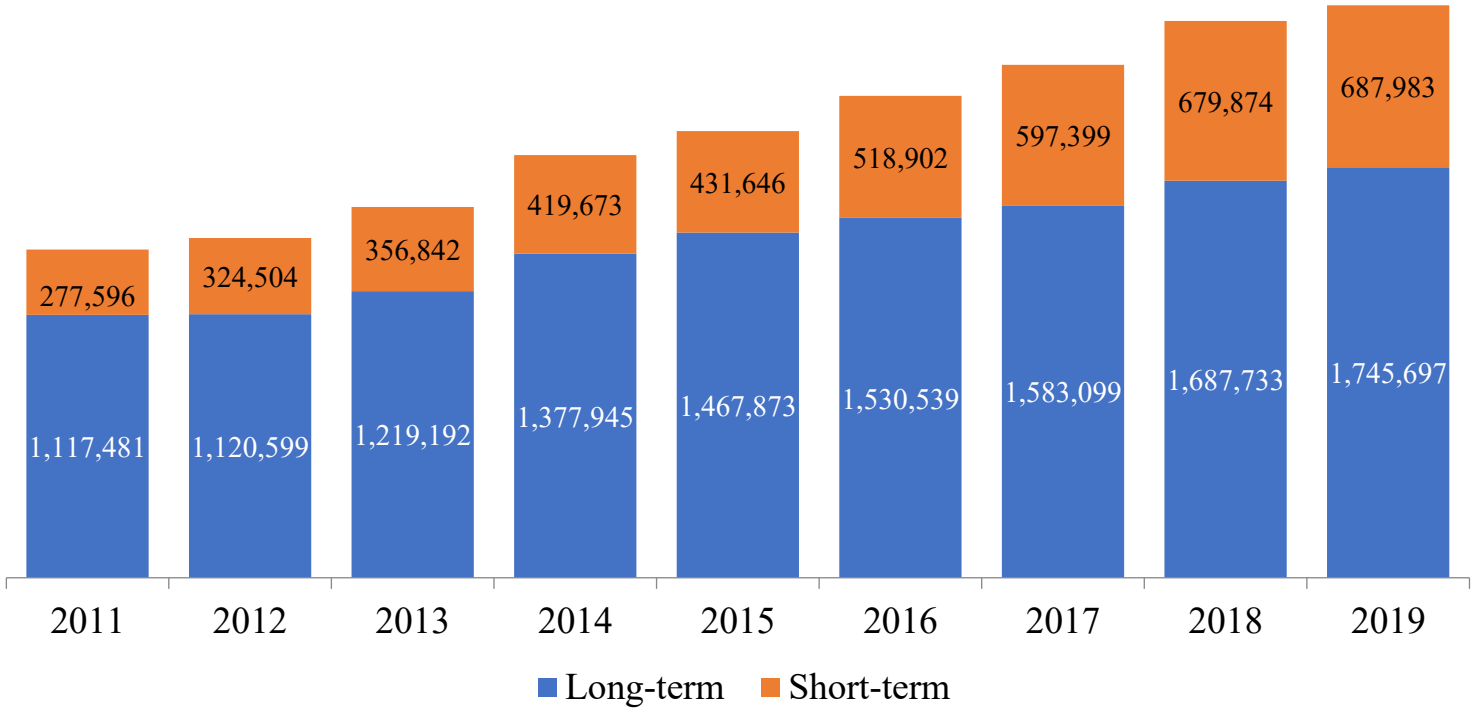
In addition, comprehensive restrictions on the right to change workplaces, the problem of lack of information on working conditions such as wages and working environment, the problem of leaving the workplace due to poor working conditions, and inefficiency due to employer-worker ineffective matching under information asymmetry situations. The problem has been constantly raised. In the end, the current system that allows non-professionals to enter the country through minimal administrative procedures may contribute to minimizing the problem of private brokers, but it is difficult to see that it contributes to the efficient use of workforces or the prevention of settlement of non-professionals.

In summary, the Korean government has been promoting foreign employment policies based on support for attracting professionals and their settlements, controlled and limited introduction of non-professionals based on the short-term cycle principle, and comprehensive employment permits for foreigners of Korean descent. However, with the majority of foreign workers being non-professional workers and the number of non-professional workers trying to settle in Korea continuously increasing, the EPS, which only focuses on minimizing private intervention in the process of introducing non-professional workers and enhancing transparency, needs reflection and amendment.

On top of that, it is essential to provide selective support for high-skilled foreign workers with a high level of human capital, while for non-professionals, it is

necessary to find a way to introduce qualified workforces possessing a certain level of human capital. To achieve this policy goal, it is necessary to analyze the wage structure of foreign workers currently in the Korean labor market to understand the association between education and wages.

Figure 1. Trend of foreign population in Korea (2011-2019)



(Source: Ministry of Justice, Monthly Immigration Statistics)

Table 3. Trend of foreign population eligible for employment (2011-2019)

Visa type / Year	2011	2012	2013	2014	2015	2016	2017	2018	2019
Professional (E1~E7)	47,095	49,887	49,706	48,910	47,922	47,740	45,685	45,549	**44,936** (3%)
Non-professional: EPS (E-9)	234,295	230,237	246,695	270,569	276,042	279,187	279,127	280,312	**276,755 (20%)**
Maritime workers (E-10)	9,661	10,424	12,163	14,403	15,138	15,312	16,069	17,447	**17,603 (1%)**
Resident (F-2)	138,418	63,362	39,704	37,504	38,881	39,681	40,594	41,099	**43,671 (3%)**
Overseas Koreans (F-4)	136,702	189,508	235,953	289,427	328,187	372,533	415,121	444,880	**464,152 (34%)**
Permanent Resident (F-5)	64,979	84,140	100,171	112,742	123,255	130,237	136,334	142,151	**153,291 (11%)**
Marriage Migrant (F-6)	4,823	86,944	117,007	120,710	120,485	121,332	122,523	125,238	**131,034 (10%)**
Overseas Koreans: low-skilled (H-2)	303,368	238,765	240,178	282,670	285,342	254,950	238,880	250,381	**226,322 (17%)**
Total	939,341	953,267	1,041,577	1,176,935	1,235,252	1,260,972	1,294,333	1,347,057	**1,357,764 (100%)**

(Source: Statistics Korea, edited by the author)

2.2. Education and Immigrants' Wage: Previous Studies

The effects of the influx of foreign workers on the labor market, the wage gap between foreign workers and the public, and the comparison of wage structures between foreign workers and the public are topics that have been receiving a lot of attention for a long time in the United States and Europe, where there are many immigrants. In particular, there are a number of papers dealing with the relationship between education, the subject of this paper, and workers' labor market performance.

Regarding the effect of education on labor market performance expressed in wages, human capital theory and signaling theory are mainly mentioned. In the former case, education affects human capital, and the higher the human capital, the higher the wage. On the other hand, the signaling theory is that the fact that you received education rather than training has a positive effect on employment. However, according to recent studies, there is little empirical evidence supporting the signaling theory, and many results supporting the human capital theory are being introduced (Chiswick & Miller 2015). Considering these discussions, this study also takes a human capital theory approach.

Among studies conducted in the United States on education level and labor market performance of foreign workers, Chiswick (1978)'s study is representative. Based on the Mincer wage function model, this study compared the coefficients by regression analysis of the wages of Koreans and foreigners into variables such as education years, career, gender, region, and length of stay. As a result, when the number of years of education is increased by one year, the wage of foreigners increases by 5.5%, while that of natives increases by 8.2%.

Bratsberg (2002) also analyzed the US census immigrants' data from 1980 to 1990, focusing on the effect of education variables on immigrants' wage determination. The study suggested that the return on education investment of immigrants from advanced countries such as Japan, Australia, Canada, and Northern Europe, where rate of return to education is relatively high, is significantly higher than that of immigrants from Central America (Caribbean) countries.

Outside the United States, there are also studies on the lower rate of return to education of foreign workers in the labor market. Hardoy, & Schøne (2014) analyzed the Norwegian labor market and found that the rate of return to education in their home countries was significantly lower, especially for non-Western immigrants. Specifically, for natives, a one-year increase in education years leads to a 6.8% wage increase, but for immigrants from non-Western countries, only 2.5%. Meanwhile, 5.7% of migrants who completed their education in Norway. It also showed that this gap is constant regardless of the career level of immigrants.

In addition, Fellini et al (2018) analyzed the Italian labor market and showed that non-Western immigrants had a low return to education done in their home countries. This trend appeared regardless of the region of origin, and researchers analyzed that this was attributed to the fact that immigrants were "trapped in the low-wage market."

Li and Sweetman (2014) analyzed the return on investment in education of foreign workers in the Canadian labor market. They showed that the source countries' average educational quality measured by sets of standardized tests has a strong association with the return to education of immigrants in the Canadian labor market

which is consistent with the idea that quality of education is positively associated with labor market performance.

There are also studies pointing out that the outcome of education investment differs by country. Patrinos and Montenegro (2014) compared the premiums of 139 countries using the World Bank database. The study showed that in most countries, the educational premium due to the completion of primary education was higher than the premium due to the completion of secondary education, with a difference of 11.5% for primary education completion and 6.8% for secondary education completion. In addition, it was found that these premium levels vary significantly by country.

In terms of immigration policy, it is important to analyze the effectiveness of the selective migration policy focusing on the education of immigrants. Borjas (1993) has shown that the relative wage level and education level of immigrants in Canada applying the selective policy are higher than in the United States. Antecol et al (2003) also found that immigrants entering Australia and Canada applying the point-based selection process showed higher level of wage, English fluency, and education compared to immigrants entering the United States. However, they inferred that this result was mainly due to the majority of Latin American immigrants with low education levels entering the United States through illegal channels.

On the other hands, some recent studies raised the question on effectiveness of selective immigration policy. First, Bertoli and Stillman (2019), in the analysis using multi-year American Community Survey data. Argued that the selection policy that relies on education may fail to improve the quality of immigrant workers, as it is not revealed that overall wage level of immigrants with high education levels is

significantly higher. Also, Tani (2020) analyzed the case of Australia applying the tight selection policy in the late 1990s and suggested that there was no clear difference in labor market performance between the policy-applied migrant group and the control group.

2.3. Previous studies on Foreign Workers in Korea

As public interest in immigration policy has recently increased, more and more papers regarding the impact of the influx of foreign workers on the economy and the wage structure of foreign workers and Koreans are being published.

Many of the early studies focused on whether the influx of foreign workers influenced the labor market. Kim (2009) estimated that a 10% increase in the proportion of foreigners increases the risk of job loss for Korean workers by 0.12 to 0.24% through an analysis of the impact of the influx of foreigners in the 2004-2005 employment permit system. In addition, Choi (2012) analyzed how the influx of foreigners affects employment and wages when the ratio of factors of production changes due to the influx of foreigners, assuming a certain level of substitution relationship between foreigners and Koreans with the same skill level. It has been shown to have the effect of lowering the wage increase of workers by 10-15%.

On the other hand, Lee et al. (2015) analyzed the occupations and industries with a high foreign inflow ratio and showed that the inflow of foreign workers was concentrated in occupations with low wages and short training years. Although it contributes to solving the shortage problem, it has shown that its contribution to the growth sector is limited.

Some studies have focused on the wage structure of foreigners. Sung et al. (2013) analyzed the wage determinants of non-specialized foreign workers (E-9) in the Employment Permit System based on data from the Ministry of Justice's survey of foreign nationals. In this study, regression analysis was carried out with wage as the dependent variable and the number of years of education, gender, age, Korean language proficiency, Korean language qualification, number of turnovers, years of service, working hours per week, company size, occupation, country of origin, etc. as explanatory variables. Did. As a result, the rate of return to education was -.0.02, indicating a weak negative correlation between educational attainment and wages.

The low return to education of non-professionals is also confirmed in recent studies. Kim (2015) compared the return to education of Korean and foreign workers in the Korean labor market. In particular, the rate of return of foreign workers belonging to the non-professional group was 0.2%, which was significantly lower than that of the foreign workers belonging to the professional group, which was around 5%.

As mentioned above, existing studies show a very low return to education for non-professional foreign workers and a relatively high rate of return for professional foreign workers. However, the existing domestic studies did not have information on the nationality of each foreigner, or the analysis was conducted under limited restrictions. Therefore, it will be meaningful to analyze the differences according to workers' country of origin and visa type.

Chapter 3. Research Question and Methodology

3.1. Why Immigrant's Education Matters

Examining the relationship between the education level and wage of foreign workers is meaningful from the perspective of immigration policy: if the correlation between education level and wage of foreign workers in the labor market is different by country of origin, it indicates that foreigners who are expected to perform better in the labor market can be 'selected' from the beginning of the immigration process. Of course, although the wage level is not an absolute indicator for evaluating immigrants, it is known that high-wage immigrants are less likely to burden the social security system, less likely to conflict with the public in the low-wage labor market, and more are favorable for long-term social integration (OECD 2018). As education level is an indicator of human capital and generally has a significant positive relationship with wage level, if it is possible to predict the labor market performance of candidates who want to enter the country through evaluation of the education level and select excellent applicants, such policy would contribute to policy effectiveness in the post-entry stage and to alleviating conflicts over immigration policy. In this respect, the analysis of the wage structure of domestic foreign workers, especially the educational effect, may provide significant policy implications.

Moreover, Korea's policy environment supports the need to improve the current immigration system. In Korea, attracting high-skilled foreign workers continues to be a policy goal, but as discussed above, the indicators point in the

opposite direction. Most foreigners are working in unskilled fields, and most of them entered the country without proper screening and introduction procedures. Particularly, for unskilled workers under the Employment Permit System (EPS), the current immigration policy is focused solely on transparency and preventing brokerage, so these workers are not subject to a meaningful selection process (namely, zero requirements) and they are only required to undergo basic health checks before entering the country. However, among the EPS workers who entered Korea, thousands of people, or 20-30% of those entering Korea, become long-term residents through marriage with a naturalized Korean or asylum application. In the case of Overseas Koreans, there have been policy considerations in favor of a distressed group of the Korean ethnic community. However, there is no special screening procedure at the introduction stage, and entry is permitted if it is confirmed that they are descendants of Korean nationals.

As discussed, the majority of foreigners, who are seeking employment in Korea, enter the country without undergoing basic human capital evaluation with regards to their educational background. The Korean government only requires an educational degree or attainment for professional visa applications. However, educational attainment is usually just one of several requirements for a successful visa application as shown in table 4 below. In the case of non-professional groups, however, educational attainment is not required for a visa application.

Table 4. Selection by educational attainment

Visa Category	Academic Degree Requirements	Requirements Differentiated by Country
Professional Visas		
Professor (E-1)	Yes	**No**
Language Instructor (E-2)	Yes	**No**
Researcher (E-3)	Yes	**No**
Technical Instructor (E-4)	Yes	**No**
Certain Professionals (E-5)	Yes	**No**
Artist and Sportsperson (E-6)	Required for certain occupations	**No**
Certain Occupations (E-7)	Yes	**No**
Non-professionals Visas		
Seasonal Employment (E-8)	No	**-**
Non-professional -EPS (E-9)	No (Bonus points)	**No**
Overseas Koreans (H-2)	No	-
Maritime Workers (E-10)	No	-
Other Visas		
Overseas Koreans (F-4)	Very Limited	**No**
Resident (F-2)	Bonus points for certain visa	**Yes (limited)**
Permanent Resident (F-5)	Bonus points for certain visa	**Yes (limited)**
Marriage Migrant (F-6)	No	-

Under the current visa system, the Korean government generally does not consider the place where the degree was obtained or acquired. Only to a limited extent, applicants for job-seeking (D-10), point-based residence (F-2-7), and some permanent resident (F-5) visas may be advantageous and get ‘bonus points’ if graduated from the world’s best universities.

Although it is important to understand the factors associated with immigrants' labor market performances in Korea, no studies have focused on whether foreign workers' educational attainment affects their performances, and how the effects of education differ by country of origin or visa group. There has been no study on the effectiveness of selective immigration policy, the results of such selection, and the short-term and long-term labor market performance of selected foreign workers as well.

As discussed in the previous chapter, it is also important to note that recent studies suggest the different perspectives regarding the effectiveness of selective immigration policy. Questioning the argument of previous studies, some researchers argued that mainly depending on education to select qualified migrants did not necessarily lead to actual improvement in immigrants' labor market performances (Tani, 2020; Bertoli and Stillman, 2019).

Considering these mixed results from abroad, this study is focusing on the effectiveness selective immigration system in Korea by comparing education effects by origin group and visa type to understand whether education is a critical factor to understand the labor market performances of foreign workers in Korea and to check whether selected workers with professional visas would show better educational effects compared to other non-selected workers such as non-professionals or marriage migrants.

3.2. Conceptual Framework

This study focuses on identifying the relationship between education and labor market performance of foreign workers. There are two concepts which are used to analyze the effect of education on labor market performance: the rate of return to education and educational wage premium. First, the return to education is a concept that shows how wages change as the number of years of education increases. On the other hand, the educational premium is a concept that shows how wages differ by level of education. The former uses education years or years of schooling as an explanatory variable, while the latter uses education level as an explanatory variable.

The rate of return to education focuses on the causal inference of the effect of additional education input, in that it evaluates the return on investment in education. The educational wage premium focuses on the difference in wage distribution according to different education levels. In the former case, it is useful to analyze the average difference in the educational effect of each group. The latter has an advantage in that it three-dimensionally shows what kind of deviations occur in the average wage level by level of education (Hanushek et al, 2006).

First, regarding the return to education, previous studies show that the return to education of immigrants is relatively lower than that of natives educated in the host country. Additionally, within the immigrant group, the rate of return of the group from developed countries is relatively higher than that of the group from non-developed countries. This difference is usually attributed to variance in the input aspect of the qualitative difference in education, or a constraint that, when the transferability of knowledge or skills is low, it is difficult for human capital formed

in the country of origin to lead to labor market performance in the host country.

The transferability issue can be understood as an inherent constraint on immigration employment. In other words, it is difficult for immigrants to directly use the knowledge or skills acquired in the country of origin in the labor market of another country. (Chiswick & Miller 2012) License systems applied to professional occupations such as law and medical services, language or cultural differences also limit transferability. A bilateral or multilateral recognition agreement is a policy measure to improve the transferability of human capital, which is to make it easier for immigrants to use their knowledge or skills in other countries by creating a standard accreditation system that can be agreed upon by several countries to evaluate the level of knowledge or skills. Representatively, ASEAN operates such a recognition system based on Mutual Recognition Agreements. (Mendoza et al., 2016)

Currently, Korean government grants visas to foreign lawyers, accountants, doctors, and pilots who meet the requirements of domestic laws to enter the labor market, but the total number of such professionals are no more than few hundreds. Indeed, since easing the transferability of immigrants' skills or knowledge means easing barriers to entry into the domestic labor market for migrants, it becomes a complex policy issue coupled with the rent-seeking activities of interest groups enjoying vested interests. This is because it inevitably implies a conflict between the immigrants and natives.

Next, the qualitative difference in education input by country is presumed to be a factor that causes different levels of return to education. Previous studies suggest that this difference appears depending on the quality of education that differs

by country and whether education is suitable for actual application in the host country's labor market. In general, even with the same degree in the same major, there is a significant difference is found depending on where the education is completed. In addition, according to the difference in the industrial structure and level of each country, the level and content of education naturally differ (Bratsberg & Terrell, 2002; Schoellman, 2012). In this regard, it can be assumed that the education effect of immigrants is generally lower than that of natives educated in the host country, and there is a significant difference within the immigrants' origin group (developed countries vs. non-developed countries).

Finally, the educational premium shows what kind of deviation there is in the wage level for each group that has completed elementary education, secondary education, and higher education (Hanushek et al, 2016). For example, if the wage level of those with secondary and tertiary education are significantly higher than those of primary education for a particular group, then selecting applicants with completion of secondary and tertiary education may be effective. Conversely, if there is no significant difference across various educational level groups, it can be argued that selection or evaluation based on academic background for such groups may not be practical or effective.

Selective immigration system to screen for immigrants with specific characteristics such as a certain level of educational attainment, widely adopted by developed countries. Studies on immigrants in the United States, Canada, and Australia showed that selective approaches have contributed to the positive selection of more-skilled immigrants while it is not clear whether these selected immigrants experienced long-term success in the receiving countries (Macaluso 2022). Indeed,

no empirical evidence to show the relationship between foreign workers' level of education and their labor market performances.

3.3. Research Question and Hypotheses

Upon these considerations, this study aims to analyze the return to education of foreign workers active in the domestic labor market in detail. Specifically, this paper analyzes whether there are any significant differences in return to education for foreign workers from countries in OECD, foreign workers from non-OECD countries, and across different visa types.

Particularly, it should be noted that overseas Koreans from non-OECD countries are the group that should be examined separately. They may have certain benefits in accessing the domestic labor market and account for a large proportion of the total foreign workers, so they are analyzed separately from other non-OECD immigrant workers. Most overseas Korean workers in Korea are from PRC, accounting for nearly 90% (Korea Immigration Service 2019).

This paper first analyzes the return to education of all foreign workers by origin group. Next, the study examines the policy ground for the evaluation of the education level focused on the professional visa by analyzing the difference in educational effects by visa type (professional, non-professional, and other visas). Finally, through the analysis by different visa type, it would be examined whether education level has an association with wages, not only for professional visa holders who are subject to selective immigration process, but also for workers with other visa types.

Previous studies reported that immigrants differ in labor market performance and educational effects by country of origin (developed or non-developed countries). Considering differences in the quality of education by country and similarities in the labor market structure, it can be expected that foreign workers from developed countries will show higher educational effects in Korea.

In the case of Korean Chinese, it is possible to speak Korean, so it has a characteristic compared to general foreigners. In order to analyze how these characteristics may affect the educational effect, it is necessary to conduct a sub-group analysis by placing Korean Chinese as a separate origin group.

Hypothesis 1. The return to education of foreign workers differs significantly by group of origin (OECD, non-OECD, Korean Chinese).

Next, from the perspective of selective immigration policy, education level is a major screening tool, so it can be expected that the group that has undergone this process will show higher educational effects. Therefore, professional visa holders who have undergone the selection process according to the level of education are expected to have higher educational effects compared to other visa holders in the same group of origin. Also, from the result of descriptive analysis, it is shown that there is no Korean Chinese with professional visas, so it is necessary to combine them with the general non-OECD group.

Hypothesis 2. In both OECD and non-OECD groups, foreign workers with professional visas who have undergone the selection process have a higher return to education than workers of other visa types.

3.4. Data and Methodology

3.4.1. Data and Variables

This paper uses the internal database of the Ministry of Justice. This data is from a survey on foreign workers conducted annually by the government across the country. All the subjects of the survey are foreigners 15 years of age or older who are registered. wages, working hours), etc. Considering that border control and economic stagnation caused by the COVID-19 pandemic had a significant impact on the foreign labor market, this study tried to exclude the impact of exogenous shocks caused by COVID-19 with analyzing 2019 data.

The subject of this study is a sample (N=7,817) of (1) foreign wage workers and (2) non-international students among the 2019 data. Excluding international students. This is because most students are engaged in part-time jobs for a short period of time as there are restrictions on the number of working hours per week. Therefore, the subject of analysis is limited to foreign wage workers excluding foreign students (D-2, D-4, H-1 visa holders) and other miscellaneous visa types including maritime workers (E-10 visa), refugee admission applicants, or other temporary residents (G-1 visa).

3.4.2. Methodology

(a) Calculation of rate of return to education

To estimate the rate of return to education of foreigners, a Mincer-type wage estimation function is used, which includes log wages as dependent variables, age, employment experience in Korea, education variables, and other control variables. Equation (1) to calculate the return to education of all foreigners is as follows.

$$ln(W_i) = \beta_0 + \beta_1 \times AGE_i + \beta_2 \times AGE^2{}_i + \beta_3 \times EXPERIENCE_i + \beta_4 \times EXPERIENCE^2{}_i + \beta_5 \times YEARS\ OF\ EDUCATION_i + \boldsymbol{B}_j \times \boldsymbol{X}_{ij} + \upsilon_i \quad (1)$$

Other control variables include sex, working hours, marital status, firm size, and workplace locations. When calculating educational premia, the number of years of education is replaced by the education level dummy variable.

(b) Hypothesis Testing: Regression Models

Based on the above formula (1), in order to test Hypothesis 1, sub-group analysis is conducted for each group, and the coefficient of years of education variable and the coefficient of education level dummy variable are compared by each group.

$$ln(W_i) = \beta_0 + \beta_1 \times AGE_i + \beta_2 \times AGE^2{}_i + \beta_3 \times EXPERIENCE_i + \beta_4 \times EXPERIENCE^2{}_i + \beta_5 \times YEARS\ OF\ EDUCATION_i + \beta_6 \times VISA\ TYPE_i + \boldsymbol{B}_j \times \boldsymbol{X}_{ij} + \upsilon_I \quad (2)$$

Similarly, to test Hypothesis 2, equation (2) above with the visa type dummy variable is used to check whether there is a significant difference in the rate of return to education by visa type. In this analysis, Korean Chinese is analyzed together with other non-OECD nationals as there is no Korean Chinese sample with professional visas.

From the results of testing Hypothesis 1 and 2, it is possible to further examine the current structure of the foreign labor market and discuss the feasibility of selective immigration policy focused on immigrants' educational attainment.

(c) Variables Structure

The variables used in the analysis are shown in table 5. The hourly wage, the dependent variable is calculated as {(average monthly wage × 12 months) ÷ (working hours per week × 52 weeks)}. In addition, the number of years of schooling which is a core explanatory variable is calculated from the education level: 'no education=0, elementary school=6, middle school=9, high school=12, junior college=14, university=16, graduate school (master)=18 graduate school (doctor). = 22'. (Hahn et al., 2014; Yoon, 2019)

In previous studies, the length of stay of foreign workers was used as an explanatory variable. However, as explained above, under the current work visa system, most foreign workers have confirmed employment or are engaged in economic activities as soon as they enter the country, so it can be inferred that the length of stay and work experience are highly correlated. In fact, as a result of the variable correlation analysis, it was found that the experience in Korea variable and the length of stay in Korea variable showed a very high correlation. (Pearson

correlation: more than 0.6) Therefore, the latter variable was excluded from the model.

The visa status variable was recategorized into five different groups, focusing on whether the selection process is applied. Particularly, a comparative analysis is conducted between two groups: the professional visa holders who are subject to the screening process in terms of educational level, the non-professionals including low-skilled overseas Korean workers, and the marriage migrants, who are not subject to such screening process.

In the case of permanent residents and equivalents, in the case of the OECD or non-OECD, high-skilled workers such as professional visa holders consist of the majority as former professional visa or investor visa holders are readily applying for permanent residency. However, in the case of Korean Chinese, not only professional workers but also mid to low-skilled workers are included in this category, as many Korean Chinese have benefited from eased requirements. Therefore, it is difficult to define this group's characteristics uniformly.

As in previous studies, this study also uses sex, marital status, workplace locations (divided into 5 region groups), and firm size (divided into 7 groups) variables as control variables as well as age and experience variables, which are the basic control variables of Mincer regression model. The key statistics of each categorical variable and continuous variable by country of origin (OECD, non-OECD, and Korean Chinese) are explained in the table below.

Table 5 (1): Key descriptive statistics

Variables	Category	OECD N=480	Non-OECD N=4,366	Korean Chinese N=3,016	Total N=7,862
Sex	**Male**	268 (55.8%)	3,236 (74.1%)	1,823 (60.4%)	5,327 (67.8%)
	Female	212 (44.2%)	1,130 (25.9%)	1,193 (39.6%)	2,535 (32.2%)
Marriage	**Married**	257 (53.5%)	2,612 (59.8%)	2,156 (71.5%)	5,025 (63.9%)
	Not married	223 (46.5%)	1,754 (40.2%)	860 (28.5%)	2,837 (36.1%)
Education level	**None-elementary**	-	227 (5.2%)	289 (9.6%)	516 (6.6%)
	Secondary	-	2,449 (56.1%)	2,256 (74.8%)	4,705 (59.8%)
	Undergraduate	308 (64.2%)	1,476 (33.8%)	438 (14.5%)	2,222 (28.3%)
	Graduate	172 (35.8%)	214 (4.9%)	33 (1.1%)	419 (5.3%)
Visa Status	**Professional visas**	186 (38.8%)	275 (6.3%)	-	461 (5.9%)
	Non-professionals	-	2,882 (66.0%)	1,067 (35.4%)	3,949 (50.2%)
	Permanent resident and equivalent	160 (33.3%)	458 (10.5%)	1,796 (59.5%)	2,414 (30.7%)
	Marriage migrants	90 (18.8%)	560 (12.8%)	110 (3.6%)	760 (9.7%)
	Others	44 (9.2%)	191 (4.4%)	43 (1.4%)	278 (3.5%)
Regions	**Seoul**	106 (22.1%)	147 (3.4%)	729 (24.2%)	982 (12.5%)
	Incheon and Gyeonggi	87 (18.1%)	982 (22.5%)	1,090 (36.1%)	2,159 (27.5%)
	Other Metropolitan Cities	144 (30.0%)	859 (19.7%)	362 (12.0%)	1,365 (17.4%)
	Other regions	143 (29.8%)	2,378 (54.5%)	835 (27.7%)	3,356 (42.7%)
Firm Size	**0-9**	98 (20.4%)	1,301 (29.8%)	1,240 (41.1%)	2,639 (33.6%)
	10-29	118 (24.6%)	1,441 (33.0%)	863 (28.6%)	2,422 (30.8%)
	30-49	51 (10.6%)	619 (14.2%)	255 (8.5%)	925 (11.8%)

50-99	62 (12.9%)	594 (13.6%)	339 (11.2%)	995 (12.7%)
100-299	70 (14.6%)	290 (6.6%)	259 (8.6%)	619 (7.9%)
300-499	20 (4.2%)	41 (0.9%)	30 (1.0%)	91 (1.2%)
500+	61 (12.7%)	80 (1.8%)	30 (1.0%)	171 (2.2%)

Data are presented as n (%). P-values <0.001 for all categories.

Variables	**OECD** **N=480**	**Non-OECD** **N=4,366**	**Korean Chinese** **N=3,016**	**Total** **N=7,862**
Age	40.7 (11.8)	33.5 (8.2)	48.0 (11.3)	39.5 (12.0)
Hourly Wage (1,000 Korean Won)	23.3 (16.1)	11.2 (4.2)	11.7 (5.0)	12.1 (6.6)
Work hours (Per week)	36.3 (11.8)	46.9 (9.9)	46.5 (12.2)	46.1 (11.2)
Experience years	4.9 (5.1)	2.4 (2.8)	4.8 (4.5)	3.5 (3.9)
Education years	16.9 (1.9)	12.5 (3.1)	11.2 (2.7)	12.3 (3.2)

Data are presented as mean (SD).

Table 5 (1) shows the key characteristics of variables by origin group. First, the proportion of male workers is about 68%. Among workers from OECD countries, the proportion of female workers is relatively high with a figure of 43.7%. The proportion of workers with spouses is 64% for all workers, but for Korean Chinese group, the proportion of workers with spouses is 72%, which is higher than the average.

Next, there is a notable difference in the level of education across origin groups. About 33% of workers from OECD countries received graduate education. With regard to Korean Chinese, the level of education is lower than that of workers from non-OECD countries. Specifically, approximately 60% of non-OECD workers are below secondary education level while 85% of Korean Chinese workers.

About 36% of workers from OECD countries are professional visa holders, while there is no Korean Chinese, and only 6% of non-OECD nationals are professional holders. Meanwhile, the proportion of permanent residents or equivalent is relatively high for Korean Chinese.

The average age of all workers is 39.5 years old, while the average age of workers from non-OECD countries is relatively low at 33 years old, and Korean Chinese is the highest at 48 years old. The average hourly wage is around 24,000 won for workers from OECD, while the average wage for non-OECD and Korean Chinese groups is around 11,000 Korean Won. The weekly working hours are the smallest at 36 hours for workers from OECD countries, and the rest of the group is similar at 46 hours per week.

Regarding average years of experience in Korea, OECD nationals and Korean Chinese show more than 5 years of experience while one of the non-OECD group is about 2.5 years. Since most workers from non-OECD countries are EPS workers who are allowed to stay temporarily, not on a permanent basis. the average year of education is 12 years, and workers from OECD countries are about 17 years, while Korean Chinese is the lowest, about 11 years.

There is a difference in the size of the residential area and the number of workers by country of origin. 70% of workers from OECD and 80% of Korean Chinese live in Seoul and the metropolitan area while only 50% of workers from non-OECD live in this area. Meanwhile, the Korean Chinese has the highest proportion of working at small businesses with less than 10 employees at 22%, while more than 20% of OECD workers are employed at large companies.

Table 5 (2): Descriptive statistics by visa type

(a) OECD

Variables	Professional visas N=186	Permanent resident & equivalents N=160	Marriage migrants N=90	Others N=44	Total N=480
Age	33.7 (9.6)	44.8 (12.1)	45.6 (9.1)	45.5 (10.0)	40.7 (11.8)
Hourly Wage (1,000 Korean Won)	19.9 (13.8)	25.5 (15.8)	19.8 (13.3)	36.6 (23.3)	23.3 (16.1)
Work hours (Per week)	37.1 (9.5)	36.1 (13.4)	32.7 (13.2)	40.5 (8.9)	36.3 (11.8)
Experience years	2.8 (3.3)	5.7 (5.0)	8.1 (6.1)	4.2 (4.9)	4.9 (5.1)
Education years	16.8 (1.4)	17.3 (2.2)	16.4 (2.2)	16.7 (1.4)	16.9 (1.9)

(b) Non-OECD (including Korean Chinese)

Variables	Professional visas N=461	Non-professionals N=3,949	Permanent resident & equivalents N=2,414	Marriage migrants N=760	Others N=278	Total N=7,862
Age	33.6 (8.0)	35.7 (10.3)	46.5 (12.5)	39.8 (9.9)	41.9 (11.3)	39.5 (12.0)
Hourly Wage (1,000 Korean Won)	15.5 (10.7)	11.1 (3.2)	12.7 (7.6)	11.8 (7.2)	16.6 (14.4)	12.1 (6.6)
Work hours (Per week)	43.0 (12.2)	48.1 (9.6)	45.5 (11.9)	41.2 (13.5)	42.0 (12.2)	46.1 (11.2)
Experience years	2.6 (3.1)	2.7 (3.0)	4.8 (4.5)	4.2 (4.8)	3.3 (4.0)	3.5 (3.9)
Education years	15.6 (3.8)	11.8 (2.6)	12.3 (3.3)	12.3 (3.5)	13.4 (4.5)	12.3 (3.2)

Data are presented as mean (SD).

Table 5 (2) above shows the characteristics of key variables by visa type. The wage level of OECD workers with professional visas is lower than that of permanent residents or other long-term visa holders and is similar to that of marriage migrants. The average age of these professional visa holders is about 34 years old, 10 years younger than other visa types, and their work experience in

Korea is the lowest at 2.8 years. The number of years of education ranges from a minimum of 16.4 years to a maximum of 17.3 years, showing no significant difference by visa type. Meanwhile, non-OECD workers with professional visas are the youngest, earn the highest, and have the highest education period at 15.6 years compared to other visa types.

Chapter 4. Analysis Results

4.1. Comparison of Education Effects by Origin Group

Table 6 below shows the result of regression analysis to show the different rates of return to education by origin group. For all foreign workers, an increase of one education year leads to approximately a 1.4% increase in their hourly wages. This rate is relatively low compared to the return to education of native Korean workers, 5% (Kim, 2015). This is mainly due to the fact that most foreign workers in Korea are low-skilled and low-educated from non-OECD countries including Korean Chinese. Overall, the wage level of foreign workers from OECD countries is 51% higher than one of the non-OECD workers and Korean Chinese workers' wage level is also 6% higher than the level of non-OECD workers.

The rate of return to education varies across different origin groups. The rate of return to education of foreign workers from OECD countries is 5.7%, whereas non-OECD workers' rate is 1.4% and the rate of Korean Chinese is only 1.1% respectively. That is, 1 additional year of education is associated with a wage increase of 1.78 million Korean Won for OECD workers (946 * 36.25 hours * 52 weeks), whereas 0.51 million Korean Won for non-OECD workers (209 * 46.88 hours * 52 weeks) and only 0.30 million Korean Won for Korean Chinese (124* 46.52 hours * 52 weeks). The analysis with the interaction term (Years of Education × Origin Groups) confirms that workers from OECD countries show a significantly higher rates compared to other groups while there is no statistical difference between Korean Chinese and non-OECD workers (Compared to non-OECD group: (i) OECD 0.047 (0.017) p=0.009, (ii) Korean Chinese -0.0048 (0.0038) p=0.208).

Table 6. Rate of return to education by origin group

	(1) Total	(2) OECD	(3) Non-OECD	(4) Korean Chinese
Age	.02***	.047*	.014***	.025***
	(.003)	(.026)	(.005)	(.005)
Age^2	-.002***	-.005	-.002***	-.003***
	(0)	(.003)	(.001)	(.001)
Experience in Korea	.013***	.019	.016***	.01**
	(.003)	(.019)	(.004)	(.004)
Experience in Korea^2	-.002	-.013	0	0
	(.002)	(.009)	(.003)	(.003)
Education Years	.014***	.057***	.014***	.011***
	(.002)	(.019)	(.002)	(.003)
Non-OECD		-	-	-
		-	-	-
OECD	.514***	-	-	-
	(.031)	-	-	-
Korean Chinese	.064***			
	(.013)			
Male				
Female	-.223***	-.235***	-.169***	-.261***
	(.01)	(.06)	(.015)	(.015)
Married				
Not married	-.008	-.02	-.003	-.01
	(.01)	(.066)	(.012)	(.018)
Constant	1.739***	.715	1.859***	1.788***
	(.065)	(.511)	(.096)	(.129)
Observations	7817	479	4347	2991
R-squared	.323	.321	.226	.232

Standard errors are in parentheses. Probability weights applied. Sex, Marriage, Region, and Firm Size variables are controlled.
**** p<.01, ** p<.05, * p<.1*

Table 7. Education premium by origin group

	(1) Total	(2) OECD	(3) Non-OECD	(4) Korean Chinese
Age	.024***	.033	.014***	.026***
	(.003)	(.02)	(.005)	(.005)
Age^2	-.003***	-.003	-.002***	-.003***
	(0)	(.002)	(.001)	(.001)
Experience in Korea	.017***	.014	.016***	.01**
	(.003)	(.017)	(.004)	(.004)
Experience in Korea^2	-.002	-.011	0	0
	(.002)	(.009)	(.003)	(.003)
Non-Elementary				
Secondary	.034*		.021	.035
	(.02)		(.021)	(.028)
Undergraduate	.125***		.061***	.083**
	(.022)		(.022)	(.035)
Graduate	.408***	.197***	.206***	.394***
	(.041)	(.071)	(.047)	(.099)
Constant	1.801***	1.698***	1.996***	1.847***
	(.065)	(.493)	(.095)	(.123)
Obs	7817	479	4347	2991
R-squared	.262	.313	.224	.238

Standard errors are in parentheses. Probability weights applied. Sex, Marriage, Region, and Firm Size variables are controlled.
**** p<.01, ** p<.05, * p<.1*

Table 7 describes the different scales of education premium across the origin groups. For all foreign workers, an education premium is observed for all levels of education with a significance level of 5%. Notably, the graduate degree holders' hourly wage is on average 25% higher than undergraduate degree holders. For foreign workers from the OECD workers, the graduate degree holders' hourly wage is about 19% higher than undergraduate degree holders. The impact of undergraduate education is relatively low for workers of non-OECD countries as well as Korean

Chinese, but non-OECD workers show much lower education premia from a college education. Particularly, the hourly wage of Korean Chinese workers with a graduate degree is 29% higher than undergraduate degree holders, which implies that graduate degree holders are enjoying relevant advantages from their educational investment in the labor market.

The hourly wage of female workers is 20% lower than one of the male workers and this tendency is shown for all subgroups. However, there is no statistically significant difference between married workers and non-married workers. Although the age and experience variables are positively associated with wage increases in general, this is not the case for foreign workers from OECD countries.

While OECD workers do not show wage increases from experiences in Korea, non-OECD workers and Korean Chinese show a significant positive relationship between experiences and their wages. Also, only non-OECD workers and Korean Chinese show an increase in wages along with age increase, while a less significant relationship is found for OECD workers.

In sum, it is confirmed that the education effects are varying by the origin of immigrant workers. OECD workers show a significantly higher rate of return to education compared to non-OECD workers and Korean Chinese workers, which supports Hypothesis 1.

4.2. Comparison of Education Effects by Visa Type

Table 8 below shows the difference in the rate of return to education by visa group. First of all, the return to education of the professional visas group is 3.9%, which is much higher than that of permanent residents, marriage migrants, or non-professionals, which are only 1% to 1.6%, mainly supporting Hypothesis 2 that the educational effect will be higher in the case of the visa group that has been under the selection process according to the level of education.

In the case of other long-term visas, they showed the highest level of return to education of 4.2%. As most of these long-term visa holders are F-2 or D-type visa holders including intra-company transferees or investors who are often engaged in professional or high-wage sectors. While some of these visa holders are not subject to the selection process considering education level, they are sponsored by major companies or verified with their financial capabilities, which accounts for their relatively higher level of return to education.

The level of return to education of permanent residents is only 1.6% which is similar to marriage migrants and not comparable to professional visa holders or other long-term visa holders, which means that their wages are not attributed to education. Meanwhile, across all visa groups, the average wages of OECD workers are 31% to 57% higher than the average wages of non-OECD workers. This gap between origin groups is the lowest in the professional visa group. This result can be understood as the difference according to education level becoming more noticeable through the selective process, while the difference between groups of origin becomes relatively reduced.

Table 8. Rate of return to education by visa type

	Total	(1) Professional visas	(2) Permanent residents & equivalent	(3) Other long-term visas	(4) Marriage migrants	(5) Non-professionals
Age	.023***	.028	.025***	.036	.027*	.013***
	(.003)	(.017)	(.006)	(.032)	(.014)	(.004)
Age^2	-.003***	-.003	-.003***	-.003	-.004**	-.002***
	(0)	(.002)	(.001)	(.004)	(.002)	(.001)
Experience in Korea	.015***	.041***	.012**	.021	.019*	.012***
	(.003)	(.014)	(.005)	(.022)	(.01)	(.004)
Experience in Korea^2	-.002	-.02**	0	-.012	-.006	0
	(.002)	(.009)	(.003)	(.012)	(.005)	(.004)
Education Years	.013***	.039***	.016***	.042***	.012*	.001
	(.002)	(.006)	(.004)	(.111)	(.035)	(.002)
Non-OECD						
OECD	.484***	.315***	.509***	.574***	.386***	-
	(.032)	(.051)	(.057)	(.108)	(.097)	-
Constant	1.752***	1.016***	1.746***	1.024	1.892***	2.073***
	(.064)	(.337)	(.14)	(.726)	(.299)	(.092)
Observations	7817	460	2393	276	754	3934
R-squared	.317	.586	.348	.488	.392	.175

Standard errors are in parentheses. Probability weights applied. Sex, Marriage, Region, and Firm Size variables are controlled.
**** p<.01, ** p<.05, * p<.1*

Table 9. Education premium by visa type

	Total	(1) Professional visas	(2) Permanent residents & equivalent	(3) Other long-term visas	(4) Marriage migrants	(5) Non-professionals
Age	.023***	.035*	.026***	.036	.027*	.013***
	(.003)	(.018)	(.006)	(.032)	(.014)	(.004)
Age^2	-.003***	-.004*	-.003***	-.003	-.004**	-.002***
	(0)	(.002)	(.001)	(.004)	(.002)	(.001)
Experience in Korea	.015***	.042***	.01**	.026	.019*	.011**
	(.003)	(.014)	(.005)	(.023)	(.01)	(.004)
Experience in Korea^2	-.002	-.02**	0	-.014	-.006	0
	(.002)	(.009)	(.003)	(.012)	(.005)	(.004)
Non-Elementary						
Secondary	.03	-.045	.024	.224**	.01	.031
	(.02)	(.091)	(.037)	(.095)	(.058)	(.028)
Undergraduate	.063***	.221**	.091**	.303**	.086	.026
	(.021)	(.1)	(.042)	(.127)	(.062)	(.029)
Graduate	.253***	.369***	.299***	.504***	-.001	.054
	(.039)	(.102)	(.075)	(.127)	(.153)	(.061)
Non-OECD						
OECD	.473***	.284***	.476***	.627***	.397***	-
	(.032)	(.06)	(.058)	(.114)	(.1)	-
Constant	1.879***	1.302***	1.888***	1.327*	2.005***	2.063***
	(.063)	(.371)	(.134)	(.705)	(.3)	(.089)
Observations	7817	460	2393	276	754	3934
R-squared	.32	.595	.353	.48	.392	.176

Standard errors are in parentheses. Probability weights applied. Sex, Marriage, Region, and Firm Size variables are controlled.
**** p<.01, ** p<.05, * p<.1*

Table 9 above shows the education premium by education level. First, in the case of marriage immigrants or non-professional workers who are not subject to the selective immigration process, even if they have completed college or graduate school education, no wage premium is observed. On the other hand, significant wage premiums are observed in the case of other visa groups, especially those with graduate level education show significantly high wage premiums compared to immigrants with low education levels.

In conclusion, Hypothesis 2 is supported in that the rate of return to education for workers with professional visas is relatively high. The educational effect of marriage migrants or non-professionals lacking the selection process was low, and permanent residents also showed a similarly low rate of return to these non-selected groups.

Chapter 5. Conclusion

5.1. Key Findings and Policy Implications

This study aimed to analyze the wage structure of domestic foreign workers to verify whether different educational effects are confirmed for each origin group, as well as analyzing whether higher educational effect exists if foreign workers are screened through the selective imaging process. First, there is a clear difference in educational effect according to the group of countries of origin, as the rate of return to education of foreign workers from OECD countries with the highest wage levels is significantly higher than that of the non-OECD and Korean Chinese groups.

In the case of Korean Chinese, the average wage level is slightly higher than that of non-OECD, but this is not attributed to the educational effect. The rate of return is similar to those from non-OECD countries, and the increase in the number of years of education per year was only 1.1%.

Workers with professional visas show significantly higher level of rate of return to education compared to other non-selected visa groups. On the other hand, no significant rate of return to education is observed for both marriage migrants and non-professional workers and permanent residents also show relatively low level of return to education.

This study has various policy implications to improve our employment visa policy framework. First, Workers from OECD countries show much higher labor market performance than those from non-OECD countries, and education

effects are significantly higher. OECD workers entering without the selection process also show better performance, which means that more flexible approaches are required to promote their entry rather than requiring uniform requirements.

Contradicting the Korean government's consistent policy goal of attracting talented people to supplement the labor market, most foreign workers today are low-wage and non-professional. Particularly, marriage immigrants and non-professional workers entering from developing countries through zero-requirement entry routes account for the dominant majority of total immigration influx, with a considerable amount of budget and policy resources being spent on these non-selected groups, including financial assistance to subsidize marriage migrants under the Multicultural Families Support Act.

In this regard, further application of the selective immigration policy should be considered, especially to immigrants from non-OECD nations, to promote the entry of competent immigrants expected to perform better in the labor market and to promote the entry of immigrants with higher level of human capital who are advantageous for social integration (OECD 2018).

Finally, it is necessary to establish panel data to analyze immigrants' long-term labor market performance. Longitudinal data will allow policymakers and researchers to grasp the picture of the socioeconomic effects of immigration inflow. If immigration policies can be established based on this analysis, more objective information on immigration can be provided to the public to promote understanding of immigration issues and government policies.

5.2. Limitation of Research

This study has several limitations. First, this study is limited in its analysis in that it is a study using single-year cross-sectional data. Foreign studies used longitudinal survey data on immigrants such as the Longitudinal Survey of Immigrants to Australia (LSIA), or the Longitudinal Survey of Immigrants to Canada (LSIC). However, there is no available panel data in relation to immigrant economic activities in Korea. By constructing and using panel data, the dynamics of immigrant economic activities can be analyzed in more detail, so that education effects can be estimated more accurately. (Hsiao 2022) It can also be used to analyze changes in labor market performance due to the increase in foreign workers' stay period and accumulation of work experience, or to analyze the probability of foreign workers' survival in the labor market.

Second, this study used education training and education level as major explanatory variables, but the data does not contain information on whether the education was conducted in Korea or in immigrants' home countries. If this characteristic can be identified clearly, it will make it possible to analyze the effect of education in Korea on the performance of the labor market. On top of that, if panel data is constructed with the variable to show the years of education in Korea, it will be possible to analyze the behavior and labor market performance of international students and to understand what kind of factors are associated with their decision to remain in Korea and access to the Korean labor market.

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국문초록

외국인근로자의 교육수준과 임금 간의 관계
- 출신국별 교육 효과의 차이를 중심으로 -

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이민자 유입이 꾸준히 증가하고 있는 가운데, 국내 외국인근로자의 대다수를 차지하는 저임금 비전문인력 대신 장기적 사회통합에 유리한 고인적자본 이민자를 유치해야 한다는 여론이 높아지고 있다. 그러나 우리나라에서는 출신국 및 교육수준에 따른 노동시장 성과 차이에 대한 심도 있는 분석과 선별적 이민정책의 효과성에 대한 논의가 부족한 것이 현실이다.

본 연구는 정부 외국인근로자 데이터를 활용, 외국인 임금근로자를 선진국(OECD), 비선진국(non-OECD), 한국계 중국인(Korean Chinese) 등 3개 출신국 집단으로 분류하여 교육투자수익률을 분석하였다. 또한 선별정책이 적용된 전문직 체류자격(비자) 소지자 집단과 다른 체류자격 소지자 그룹을 나누어 같은 분석을 실시하였다.

분석 결과, 선진국 출신 외국인근로자의 평균 임금은 다른 두 집단보다 약 50% 높았으며, 1년 교육 증가에 따른 교육투자수익률이 다른

두 집단보다 4배 이상 높았다. 비선진국 출신 외국인근로자와 한국계 중국인의 평균 교육투자수익률은 1% 수준으로 비슷한 수준이었으나, 한국계 중국인의 평균 임금이 약 6% 높았다. 체류자격별로는 선별과정을 거친 전문직 체류자격 집단의 교육 투자수익률이 결혼이민자나 고용허가제 비전문인력 체류자격 소지자 등에 비해 유의미하게 높은 것으로 나타났다. 또한 선진국 출신 외국인근로자는 모든 체류자격에서 비선진국 출신 외국인근로자에 비해 평균적으로 30~60% 높은 임금을 받는 것으로 나타났다.

이러한 결과는 선진국에서 교육을 받은 외국인근로자의 노동시장 성과가 보다 나을 것이라는 일반적 추론과 부합하며, 이민자 선별 과정에서 선진국에서의 교육 이수 경력을 긍정적 요소로 고려하는 정책 접근을 지지하는 것이라고 할 수 있다. 또한 출신국 집단을 막론하고 선별 과정을 거친 전문직 체류자격 집단의 교육 투자에 따른 노동시장 성과가 선별을 거치지 않은 집단보다 상대적으로 우수하다는 점에서, 향후 교육 수준 등을 고려한 선별적 이민정책을 보다 확대할 필요성이 있다.

주요어: 이민정책, 선별적 이민, 교육효과, 교육투자수익률

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