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Determinants of International Labor Migration to Korea

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EXECUTIVE SUMMARY

Since the 1990s Korea has emerged as one of the major migration destinations in Asia. This paper represents one of the first attempts to examine the determinants of bilateral labor migration to Korea across source countries and over time. We analyze the effects of economic, demographic, and policy factors. We also examine the role played by trade between Korea and origin countries. The results suggest that economic fundamentals, including income level in Korea, as well as demographic factors both in origin countries and Korea, play an important role, while different patterns are observed for skilled and unskilled migrant workers. We also found that trade is an important predictor of the size and composition of foreign migrant population in Korea. We speculate that trade influences migration to Korea through the information effect and foreign labor policy channel.

Keywords: international labor migration, determinants, skilled and unskilled labor

JEL Classification: F22, J61, F1

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I. Introduction

Once a country of emigration, Korea has been transformed into a major migration destination in Asia over the past two decades. The size of its foreign population increased from one hundred thousand in 1993 to 1.6 million in 2013, which accounts for three percent of the total population (Korea Immigration Service 2013; Korea National Statistics Office 2003). Compared to the US or the UK, which have a long history of immigration and a wide range of source countries, international migration to Korea is a recent phenomenon that goes back only about two decades, and its sources are heavily concentrated in a small number of Asian countries. In terms of institutional features, Korea maintains a relatively restrictive migration policy by international standards, where permanent residency and family reunification account for a minimal part of both the routes of entry and migrant integration.

A common view is that migration to Korea has increased dramatically as a result of Korea's economic development and demographic changes. Yet beyond this general perception, very few empirical studies have attempted to explain what exactly drives international migration to Korea and why migration is concentrated into certain countries. In fact, as far as we know, no empirical study has been conducted to quantitatively analyze the bilateral patterns of migration to Korea. Among other reasons, this is largely due to the unavailability of data. The Korea Immigration Service (KIS), a government agency under the Ministry of Justice tasked to oversee inbound migration, publishes yearly international migration statistics. The raw data, however, require significant cleaning and processing to support effective statistical analysis.

In this paper, we use newly created panel data on bilateral migrant stock in Korea constructed from the KIS data. This paper may be the first attempt to provide econometric estimates of the determinants of bilateral migration to Korea using cross-section and time-series data. We consider various economic, demographic, and policy factors to explain variation in bilateral patterns, and we give special attention to the role of trade in addition to these usual factors that affect supply and demand of foreign labor.

This paper is organized as follows. Section 2 reviews the literature on determinants of international migration. Section 3 reviews the trends and policy of international labor migration to Korea, and we pay special attention to the source-area composition and examine whether bilateral trade relations are linked to migration patterns. Section 4 discusses the Korea migration data and model, describes the data used, and addresses some econometrics issues. Section 5 presents the main empirical results, and section 6 concludes.

II. Literature on Determinants of International Migration

The model of international migration includes a wide array of economic and policy factors that affect the cost and benefit of relocation. The most influential factor in the decision to migrate is geographic differences in wages or income levels between the origin and destination, factoring in migration costs (Sjaastad 1962; Borjas 1987). The relative income of the potential migrant in the source country compared to in the destination captures the differences in returns to human capital. Migration costs are usually captured by geographic distance, often accompanied by cultural and linguistic distances. Here migration costs include not only transportation, but ex-post costs involving job search and settlement. An important factor in this regard is the assistance of previous migrants from the same source country, otherwise known as migrant network effects, because previous migration lowers migration costs significantly by reducing information and adaptation costs. In addition to income (or wage) levels in the source and destination countries, distance variables, and migrant networks, other factors, including income distribution, human capital, unemployment, demographic factors, and macroeconomic conditions for both origin and host countries also matter (Clark *et al.* 2002; Karras and Chiswick 1999; Mayda 2010; Mitchell *et al.* 2011).

Migration policy also plays an important role in shaping migration patterns because it significantly affects the migration costs borne by potential migrants. Hatton (2004) and Mayda (2010) empirically find that economic and demographic forces are less significant when strict immigration policies are instituted in host

countries. Numerical restrictions (quotas), visa requirements, and strong immigration enforcement indicate a more restrictive immigration policy.

Our work is related to previous studies that analyze bilateral migration patterns of the US, the UK, and other Organization for Economic Cooperation and Development (OECD) countries. Different studies emphasize different explanatory variables, although the main findings are largely consistent with the standard migration model. Clark *et al.* (2007) use panel data on bilateral immigration rates to the US across source countries for 1971-1998. In addition to the strong impact of relative and absolute income, migration networks, distance, and common language, the authors also find that inequality has nonlinear effects depending on the levels of inequality in the source country relative to the US. The findings also suggest that the effects of these economic variables are conditional on US immigration policies, including various quota systems. They also point to the effect of heterogeneity, indicating that the effects of economic variables differ by source regions.

Karemera *et al.* (2000) develop a modified gravity model to examine migration flows to Canada and the US over the period of 1976-1986. They too examine economic and demographic factors in the origin and destination countries and find evidence in support of the importance of the population of origin countries and the income of destination countries. In addition to immigration policy at the destination, the authors shed light on how the barriers to emigration in the origin country matter.

Hatton (2005) explains international migration to the UK across source countries and for the period of 1976-2000. The findings indicate that relative income and unemployment in the UK have a large effect, yet increasing inequality in the UK is the key variable that explains the rise in immigration to the UK over the

years. In addition, they found that a more permissive immigration policy raised the immigration level especially in the 1990s. In their analysis of the drivers of migration flows to the UK, Mitchell *et al.* (2010) also consider the income levels of alternative destinations, since migrants usually choose a specific destination from multiple candidates.

Rotte and Vogler (1998) examine migration flows from least developing countries to Germany and find income differentials, political situation of the origin country, and migration networks have a significant impact on the inflows. Their work is noteworthy for including trade relations between Germany and origin countries as one of the determinants of migration, although the effects of trade appear heterogeneous across different geographic regions. In their analysis of the effects of macroeconomic conditions on the net immigration to Germany during 1964-1988, Karras and Chiswick (1999) find that year-to-year changes in migrant flows are affected by cyclical economic conditions; that is, growth rates in the destination country and long-run trends are determined by income convergence in standards of living.

Mayda (2010) studies the determinants of bilateral migration to multiple destination countries. In her analysis of panel data of 14 OECD countries for 26 years, she finds that income, distance, common language, and demographic factors are important determinants, yet their effects are strongly conditioned by immigration policies at the destination. In a more general treatment of the topic, Freeman (2006) suggests that immigration will increase due to aging populations and low birthrates in developed countries, income disparities, and increased education in developing countries.

In their recent study of bilateral migration flows from 120 sending countries to 15 OECD countries over the period 1980-2006, Ortega and Peri (2013) also

find that destination income levels and immigration policies are highly important in determining migration flows. They report that the effects of destination income and immigration policies differ for migration within the European Union (EU) and migration from outside the EU. Their analysis is particularly aided by a new panel dataset containing information on the restrictiveness of immigration policies for main destinations.

III. International Labor Migration to Korea

1. Trends and Characteristics

International migration to Korea has evolved separately in three main categories. There is migration of unskilled laborers, marriage-related migration, and ethnic (mostly Korean-Chinese) return migration.¹ Most international marriages in Korea are commercialized by for-profit marriage brokers. The marriage patterns have been dominated by brides from developing countries marrying grooms in the rural sector of Korean society. The prominence of marriage migration is a unique characteristic of international migration to Korea, although large-scale inflows of foreign spouses are also observed in the other Asian countries such as Japan, Taiwan, and Singapore.

Ethnic Korean return migration is a cross-cutting category that encompasses both labor and marriage migration. Yet, because of its sheer size and sociological complexity, it is often discussed as a separate category by policymakers and scholars. Ethnic Korean migrants, mostly descendants of Koreans who moved to or were taken to China and former Soviet countries during the Japanese colonial rule, have been admitted to Korea under special arrangements in large numbers since the end of the Cold War. Because they come from developing countries

¹ It should be also pointed out that our definition of labor migrants differs from the official statistics. The Ministry of Justice includes both long-term and short-term workers in its statistics. To maintain consistency with the dataset we use in our empirical analysis, we only include long-term work permit holders as labor migrants in our descriptive statistics.

with lower human capital and lower social privilege than Korea, most of them are channeled into Korea as unskilled migrant workers or foreign spouses.

Finally, labor migrants to Korea, estimated at 790,000, made up three percent of the country's total labor force of 26.3 million workers in 2013 (Korea Immigration Service 2013; Korea Statistics Office 2003). In 1995, there were only approximately 50,000 labor migrants. The 2012 Foreign Labor Force Survey reports that 74 percent of total foreign residents participate in the labor market, and the unemployment rate is about 4 percent. Table 1 shows the trends in labor migration to Korea for the past two decades.

The first feature of labor migration to Korea is that it is strictly bounded by time and employment contract. It is a contract-based temporary migration with little or no possibility for gaining permanent residency or citizenship. Most countries in the world require employment visas based on skills for labor migration, yet the family reunion policy usually allows foreigners to enter the country who may be unqualified to be admitted otherwise. Combined with permanent residency,

Table 1. Trends in Labor Migration to Korea, 1995-2010

	1995 Year		2000		2005		2010	
	Numbers	%	Numbers	%	Numbers	%	Numbers	%
Labor migrants	50,930	46%	122,498	58%	248,026	51%	528,952	58%
Skilled	8,214	7%	15,582	7%	23,504	5%	42,485	5%
Unskilled	42,716	39%	106,916	51%	224,522	46%	486,467	53%
Others	59,098	54%	87,751	42%	237,118	49%	389,965	42%
Total migrants	110,028	100%	210,249	100%	485,144	100%	918,917	100%

Note: Only foreign residents staying longer than three months on any type of employment visa are considered. Figures are based on authors' calculation and thus different from the KIS official reports. Certain employment visa categories, including seafarers, are not included.

Source: Korea Immigration Service, Statistical Yearbook, various years.

this contributes to the increase in the permanent foreign labor force by allowing unskilled migrants to bypass skill requirements or other restrictions.² In contrast, Korea's highly restrictive family reunion policy does not allow such type of migration.

The second feature of labor migration to Korea is that the flows are overwhelmingly dominated by unskilled workers. Although unskilled migration outnumbers skilled migration worldwide, the proportion of unskilled migrants is exceptionally high in Korea. Only 9 percent of total labor migrants are in the "skilled" category, and about half of them were language instructors (mostly English) in 2010 (Table 1).

2. Labor Migration Policy

Like many other destination countries, Korea takes a two-track approach to foreign labor. The government seeks and welcomes skilled workers, such as computer scientists and software engineers, by offering incentives and relaxing immigration regulations. In contrast, unskilled migrants are subject to a restrictive system of admission and residence.

The foreign labor policy of Korea has not changed significantly since its inward labor migration began in the early 1990s. Throughout the years, unskilled foreign workers have been allowed to stay in the country based on a work contract for a terminal period of time. The main goal of the labor migration program was to alleviate the labor shortage in manufacturing small and medium enterprises (SMEs). The recruitment of unskilled foreign labor later expanded to

² It is worth noting that family reunification accounted for 63.4 percent of total US immigration in 2001 (McKay 2003, <http://www.migrationinformation.org/feature/display.cfm?ID=122>).

agriculture, the fishing industry, and construction. The trends have been a rapid increase in labor migration, expansion of sectors for foreign labor employment, and expansion of migrant workers' rights.

Throughout the process, two distinct labor import programs have been in place. In 1993, the Industrial and Technical Training Program (ITTP), modeled after a Japanese foreign labor program, was introduced. The most important characteristic of this scheme was that labor migrants were treated and paid as "trainees" and not "workers." Combined with harsh employment conditions, ITTP created a serious illegal immigration problem. The rampant illegal employment and rights abuse of foreign workers eventually led to the end of the ITTP. ITTP was gradually replaced by the Employment Permit System (EPS) starting from 2004, and EPS became the sole institutional mechanism recruiting foreign unskilled workers in 2007. The most important features of this new system include the exclusion of private recruitment agencies and the expansion of the labor rights of foreign workers, including a minimum wage and severance pay arrangements. EPS in 2007 incorporated a special program for ethnic Korean unskilled workers from China and other regions under the Visit and Employment Program.

Under the EPS, foreign unskilled workers are only admitted from 15 countries with which the Korean government signed an MOU for labor import. Every year, the Korean government decides on the total number of foreign unskilled workers to be admitted for that year and allocates quotas among the 15 countries.³ Sending-country governments process the applications according to the agreement with the Korean government, and successful applicants are given employment

³ They are Bangladesh, Cambodia, China, East Timor, Indonesia, Kyrgyzstan, Mongolia, Myanmar, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, Uzbekistan, and Vietnam.

contracts and subsequently admitted to Korea. Table 2 shows the annual number of foreign workers admitted under EPS from 2004 to 2012 by the country of origin. Since Korea admits only a fraction of potential migrant workers seeking to work in Korea, the number of arrivals more or less reflects the national quotas granted that year. Admission quotas are far from evenly distributed and are concentrated into a few countries. For instance, in 2010, the top five countries of Vietnam, Sri Lanka, Indonesia, Uzbekistan, and the Philippines accounted for 63 percent of total annual quotas (Table 2).

Table 2. Foreign Workers Admitted Under EPS by Country of Origin, 2004-2012

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total	3,167	31,659	28,976	33,687	75,024	63,323	40,457	49,210	51,730
Vietnam	704	8,619	5,712	11,507	19,707	13,497	9,328	12,574	6,853
Philippines	832	5,308	8,434	5,928	6,289	9,282	3,165	3,131	2,844
Thailand	558	5,964	6,746	5,798	9,287	9,957	2,977	4,078	5,031
Mongolia	500	4,433	4,703	2,642	4,775	4,032	2,157	1,075	2,528
Indonesia	359	4,361	1,215	4,343	12,304	4,981	4,383	6,322	6,110
Sri Lanka	214	2,974	2,166	2,194	7,163	4,244	4,498	5,340	4,069
China	-	-	-	403	1,833	4,281	708	755	139
Uzbekistan	-	-	-	275	4,492	2,779	4,045	2,700	3,973
Pakistan	-	-	-	365	2,355	1,628	1,014	441	679
Cambodia	-	-	-	198	2,793	2,524	2,297	4,959	8,047
Nepal	-	-	-	34	2,014	2,445	2,264	3,713	5,876
Myanmar	-	-	-	-	67	2,037	218	1,956	3,557
Kyrgyzstan	-	-	-	-	451	181	313	300	240
Bangladesh	-	-	-	-	1,494	1,361	2,750	1,681	1,299
East Timor	-	-	-	-	-	94	340	185	485

Source: Korea National Indicators, Korea National Statistics Office (<http://www.index.go.kr>).

Korea is unique in the sense that the government annually distributes pre-determined worker quotas to its labor cooperation partner countries.⁴ In most countries, the overall size of the new intake of unskilled migration is decided by domestic factors, including macroeconomic conditions, labor shortage assessments, employment levels, and other factors, such as ceilings on visas for employment, diversity, and refugee status (Clark *et al.* 2009). What is unique about the Korean system is that these underlying market factors are channeled through an explicit government decision-making process.

Every year, the Foreign Labor Policy Committee first decides the sectors in which migrant workers are allowed to work and the total number of new foreign workers to be admitted, based on labor shortages in the specific sectors as well as the macroeconomic conditions of the Korean economy, most notably the unemployment rate. Then it proceeds to distribute quotas among individual countries. The distribution decision is based on the following three factors: (1) employer preferences for the nationality of the potential migrant worker, (2) foreign policy considerations, and (3) the size of the illegal migrant population from the country. For the most part, employer preferences are granted the most importance partly because there is little pre-migration information about foreign workers' skill levels under the EPS. This leads to employers using nationality as a proxy for skill levels and work ethic (Hur, 2012). Foreign policy considerations also come into play when Korea needs to strengthen bilateral cooperation with the partner country, which is equivalent to granting the partner country preferential access to the labor

⁴ This should not be confused with the national origin quota system maintained by the US and Canada before their major immigration reforms in the 1960s and 1970s. In these systems, the eastern and western hemispheres were treated differently, yet there were no bilateral quotas for individual countries.

market, though on a small scale. The final factor to affect bilateral migration quotas is the number of existing illegal migrants.⁵ Korea has substantially higher rates of illegal migration than Japan (3 percent) and even the US (10 percent).⁶ In 2011, 38 percent of unskilled foreign workers on an E-9 visa overstayed upon the termination of their term. Yet policy responses to illegal migration have been timid, mainly because of the political pressure from the SMEs and agricultural sector. It is only as recently as 2012 when the Korean government took illegal migration seriously enough concerning the new quota distribution and reduced the permits to Vietnamese workers by 85 percent (Table 2).

3. Source Area Composition and Trade Links

Finally, an important feature of labor migration to Korea is its source area composition. The source country distribution is heavily skewed toward Asia. Table 2 shows the overall distribution over time. In 2010, Asian labor migrants accounted for 88 percent, with 57 percent from Northeast Asia (including China and Japan), 27 percent from Southeast Asia, and 4 percent from South Asia. The overrepresentation of Asia among the foreign workers has not changed over the past twenty years, suggesting that Korea has consistently drawn its labor migrants from the region.

Why does Korea draw more labor migrants from Asia than other regions? The geographical proximity and high variance in economic development in Asia

⁵ The majority of cases of undocumented workers in Korea are overstay or unauthorized employment. Since South Korea is geographically distant from most of its migrant sending countries and does not have shared borders, illegal border-crossing is rare. As a result, undocumented migrants are mostly those who have overstayed their visa or become employed in the black market.

⁶ Yomiuri Shimbun 2012; Batalova and Lee 2013.

Table 3. Source Area Composition of Labor Migrant Stock in Korea, 1995-2010
(Absolute Numbers and Percent of Total from Each Source)

Region of Origin	1995		2000		2005		2010	
	#	%	#	%	#	%	#	%
Europe	950	2	3,145	3	3,976	2	6,609	1
Russia CIS	845	2	5,616	5	22,993	9	32,130	6
Americas								
North America	5,140	10	5,834	5	9,759	4	19,402	4
Latin America & Caribbean	198	0	175	0	389	0	293	0
Asia	43,305	85	106,574	87	207,704	84	467,310	88
Northeast Asia	18,783	37	44,228	36	80,211	32	301,012	57
Southeast Asia	18,546	36	47,608	39	97,313	39	144,027	27
South Asia	5,976	12	14,738	12	30,180	12	22,271	4
Middle East & North Africa	242	0	102	0	982	0	300	0
Sub-Saharan Africa	69	0	192	0	851	0	1,572	0
Oceania	179	0	852	1	1,355	1	1,317	0
Others	2	0	8	0	17	0	9	0
Total	50,930	100	122,498	100	248,026	100	528,952	100

Note: Northeast Asia includes Hong Kong, Macau, and Taiwan. Regional classification differs from the KIS statistical yearbooks.

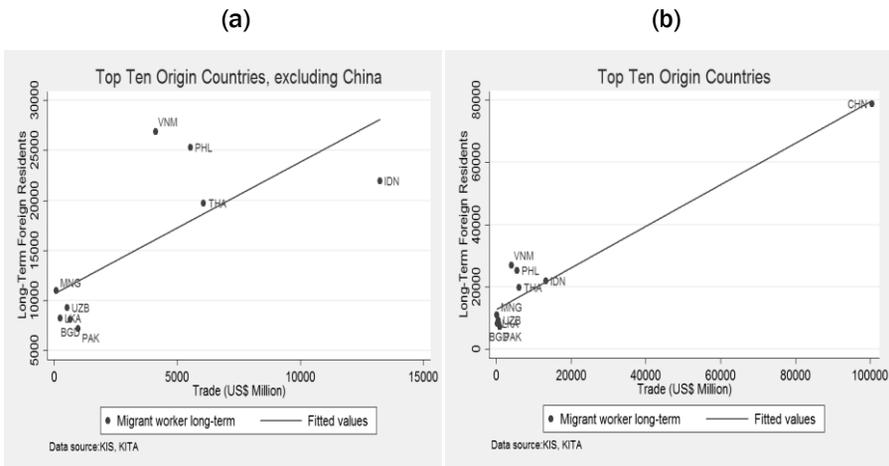
Source: Korea Immigration Service, Statistical Yearbooks, Various Years.

may be some of the reasons, yet geography and economic gaps may not provide the whole story. In addition, not bordering any of the origin countries and with no colonial relationships, Korea is not particularly positioned to attract migrants from specific cultural or historical backgrounds. The high concentration of migrants from Asia immediately raises the question as to whether this is related to Korea's close *economic* engagement with the region.

Table 3 shows Korea’s trade relations with the world. The share of the Asian region in total volume of trade with Korea has been large. In 2010, trade volume between Korea and Asian countries accounted for about 48 percent of Korea’s total trade. Figure 1a shows the positive correlation between the number of migrants from the source country and trade volume between the source country and Korea. Similar patterns are observed when we exclude China, which is a predominant source of migrants and also the largest trading partner of Korea (Figure 1b). Likewise, Korea is an important trading partner for China and Southeast Asia. For Vietnam, which is an important source country for international labor migration to Korea, trade with Korea accounts for 8 percent of the total trade Vietnam conducted in 2010 (ASEANstats).

In trade literature, migration is explained as the movement of a production factor. In the framework of the traditional Heckscher-Ohlin international trade

Figure 1. Correlations Between Trade and Migration to Korea, 2005



$r=0.96^{***}$

$r=0.71^{**}$

Table 4. Korea's Trade Concentration by Region, 1995-2010
(Percent of Total From Each Source)

Trade Region	1995		2000		2005		2010	
	(US\$ Million)	%	(US\$ Million)	%	(US\$ Million)	%	(US\$ Million)	(%)
Asia	109,473	42	138,052	41	252,788	46	425,857	48
Northeast Asia	77,796	30	95,571	29	190,600	35	308,155	35
Southeast Asia	28,116	11	38,309	12	53,522	10	97,296	11
South Asia	3,561	1	4,173	1	8,666	2	20,406	2
Others	150,704	58	194,696	59	292,869	54	465,739	52
Total	260,177	100	332,749	100	545,657	100	891,596	100

Source: Korea International Trade Association.

model, trade of goods and factor mobility are substitutes based on the comparative advantage of relative factor abundance. However, Markusen (1983) shows that trade and migration may be complements, if the underlying assumptions such as identical technologies and constant returns of scale of the H-O model are relaxed. Considering the H-O model with migration costs and financing constraints, Schiff (1994) shows that trade liberalization is likely to result in an increase in migration in the long run. Assume that country S is labor abundant and protects the capital-intensive sector. The wage-rental ratio in country S is relatively lower than that of country N, which is capital abundant. Due to the wage differential between two countries, there exists an incentive to migrate from country S to country N. Trade liberalization of the capital-intensive sector in country S raises the wage-rental ratio. This reduces the wage differential of the two countries and results in a decrease in migration. However, if trade liberalization raises the wage enough to pay for migration costs, and the cost of migration is less than

the wage gap of the two countries, then migration increases, and this raises the stock of migrants in country N.

In the present study, we do not intend to investigate the relationship between migration and trade within the framework of factor mobility. Rather, keeping the theoretical consideration of the relationship between migration and trade in mind, the simple effect of trade volume on migration will be analyzed. We speculate that there are two channels that may link trade to migration in the case of Korea. First, trade may facilitate bilateral migration through information and policy channels. Our reasoning is that trade disseminates information about Korea, making Korea more attractive for employment than if little had been known about it. Rotte and Vogler (1998) tested the hypothesis that more economic contacts lead to an increase in migration through improving information flow and lowering migration cost.⁷ The authors included the volume of trade as one of their explanatory variables in the analysis of the determinants of migration from developing countries to Germany and found that there is a positive effect of trade on migration from the Asian region. Second, policy considerations related to trade also come into play because the Korean government has a strong incentive to make concessions to its important trading partners. Being an export-oriented economy, it needs to maintain a good relationship with trading partners. Furthermore, destination countries often sign a bilateral labor migration

⁷ The authors argue that economic development accelerates emigration by reducing financial restrictions to migration, and trade and FDI are the major instruments for fostering economic advance in developing countries. Their paper includes a survey of literature on the relationship between migration and trade with a focus on the complementarities. For the empirical analysis, the authors considered the volume of trade as evidence of the economic link between the sending country and Germany and noted that it is not for the assessment of the substitute or complementary relationship of trade and migration.

agreement admitting unskilled workers to leverage concessions on market access in origin countries (Gordon 2010). By the same logic, the Korean government may grant special access to its own labor market to strengthen the trade relations with the partner country.

IV. Data and Model

1. Data

Annual bilateral stock data on labor migrants are from the Statistical Yearbooks on Immigration Control published by the Korea Immigration Service (KIS) of the Ministry of Justice. The coverage of national origin and visa category is complete in the KIS data. In KIS, migrants are divided into two groups: “short-term” foreign residents, allowed to stay up to three months, and “long-term” residents, who stay longer than three months.⁸ In our analysis, we only use data on long-term residents because staying longer than three months would have a greater impact on Korea’s domestic labor market and the larger society.

In our analysis, we focus on those migrants admitted for employment purposes, regardless of their post-migration participation in the Korean labor market. It is true that migrants on spouse, student, or tourist visas do work in Korea. A 2012 National Statistics Office survey reports that 74 percent of migrants in Korea participate in the labor market, many of whom include marriage migrants and foreign students (NSO 2012). Nevertheless, the KIS database only contains the visa status of migrants and has no labor market information. This also means that sectoral disaggregation is impossible in our analysis. Since the KIS database is the only data source currently available to construct bilateral panel data, our

⁸ The international convention is usually a year, substantially longer than the Korean cut-off line.

analysis is restricted to the foreign residents on employment visas, regardless of their actual labor market participation, which leads to underestimation of the foreign labor force in Korea.⁹ To construct a labor migrant variable, we summed up the following visa categories from the KIS data: skilled migrants (E1 to E7, excluding E6), unskilled migrant workers (D3, E8, E9, and H2) and entertainment visa holders (E6).¹⁰

Finally, our data contain annual information on the bilateral international labor migrant population in Korea. The decision to use migrant stock rather than flow for analysis is based on the fact that constructing bilateral migration flows from the KIS database is technically difficult at the moment.

2. Empirical Model

Drawing on the literature and our observations, we estimate the following model:

$$\begin{aligned} Mig_{i,t} = & \beta_0 + \beta_1 income_{i,t-1} + \beta_2 income_{korea,t-1} + \beta_3 distance_{i,t-1} + \beta_4 popul_{i,t-1} + \beta_5 youth_{i,t-1} \\ & + \beta_6 aging_{korea,t-1} + \beta_7 unempl_{korea,t-1} + \beta_8 trade_{i,t-1} + \delta_i I_i + \delta_t I_t \\ & + \epsilon_{i,t} \end{aligned} \quad (1)$$

where the left-hand-side variable is foreign residents in Korea from country i in year t . This migration measure differs from what was used in some of the previ-

⁹ The annual Foreign Labor Force Survey administered by the national statistics agency of Korea contains detailed labor market information including wages and types of employment. Yet it is fairly recent (it began in 2012) and thus significantly limited in the period it covers.

¹⁰ See Appendix for details.

ous studies by Clark *et al.* (2007) and Mayda (2010), where the authors use bilateral emigration rates (bilateral emigration flows over the source country population). Considering Korea's relatively less prominent position as a global migration destination, the ease of interpretation, and policy implications for Korea, it would be of value to know how many migrants are in Korea as an absolute number rather than at what propensity they come. Therefore, we use the absolute number of migrants, not migration rates and include the source country population as a control variable. To capture the income gaps between origin country and Korea, we include per capita GDP, measured in current US dollars, for origin countries as well as Korea. Relative income difference between the source and the destination country strongly influences the decision to migrate.

Geographic distance is a major obstacle to migration and captures migration costs. The variable for distance is a (log) geographic distance between the source country and Korea drawn from the Centre d'Etudes Prospectives et d'Informations Internationales. The model includes two age-related variables. First, the variable measuring the proportion of the population aged 15-29 from the origin country captures the age structure of the source country more likely to send out migrants. Since younger migrants have higher present values of income gains at destination, the large size of the young population can indicate the aggregate propensity for emigration of the country. On the other hand, the demographic transformation at the destination, especially an aging population and low fertility rates, is a powerful pull factor. The variable of Korea age dependency measures the proportion of those over age 64 to the working age population.

An important factor tied to domestic politics is the Korean unemployment rate. Along with income levels, the unemployment rate influences the probability of securing employment and gaining wages at the destination. In the case of un-

skilled migration, the Korean government considers the unemployment rate for the overall level of new admissions. Common border, common language, and colonial ties are not considered because they are not relevant to the migration experience when Korea is the destination. The years of schooling series developed by Barro and Lee, the inflation levels in Korea and the origin countries, and unemployment rates in the origin countries proved to be insignificant in the regressions, and so these are omitted from the results presented in the next section. Migrant networks, or preexisting migrants, significantly reduce migration costs by providing information about the migration process and employment opportunities at the destination and reduce psychological costs of relocation. Yet precisely because previous migrant stock is such a powerful predictor of current migration, it tends to absorb most of the explanatory power of other variables; therefore, it is not included in our model.

The most important change, although limited, in labor migration policy was introduced in 2004 when EPS replaced the ITTS. The policy change was not as significant as the US Immigration reforms in 1965 or 1981, which considerably increased the migration inflows and shifted the type and origin country composition of migrants. In fact, the key features of labor migration to Korea have barely changed over the past two decades. Table A1 in Appendix presents policy changes over the foreign labor force for 1993-2012. Year dummies for 2003 and 2004 capture the EPS introduction and migration amnesty that preceded it. From 1993 to 2012, there were two global economic crises. The first was the 1997 Asian Financial Crisis, which severely affected the Korean economy. The second crisis was the Global Economic Recession of 2008, which Korea weathered relatively well. Economic shocks of these years are included as dummy variables for 1999 and 2009.

The most interesting explanatory variables for our purposes are the next two sets of variables related to trade: trade volume and trade surplus for Korea in relation to the source country. Except for migration and trade variables, all data are drawn from the World Development Indicators published by the World Bank. Obviously, there are concerns about reverse causality and endogeneity. Time-variant third factors may drive contemporaneous trade and migration. We do not think migration to Korea drives trade, as found in some of the recent migration literature, for the following reasons. First, migration to Korea came much later than trade concentration in Asia. Second, the trade-facilitating role of migration heavily relies on skilled migrants or immigrant entrepreneurs (Gould 1994), which Korea simply lacks at the moment.

V. Empirical Results

We estimate our migration model on panel data for migration to Korea by place of origin for 138 countries from 1993 to 2011. The left-hand-side variable is the annual labor migrant stock by country of origin transformed into natural logs. The right-hand-side variables are also transformed by taking natural logs, except for the share of young population in the origin country, old age dependency of Korea, unemployment of Korea, and dummy variables. Our estimating method is fixed effects regression. The estimates of random effects are rejected against the alternative of fixed effects. The variable distance is thus eliminated in all specifications. All the independent variables except distance and dummy variables are entered with a one-year lag.

Table 5 presents the results. Model 1 is the baseline model without the trade variable. Model 2 includes bilateral trade volume, and Model 3 uses trade surplus for Korea. Models 4 and 5 re-estimate the model separately for skilled and unskilled migrants for robustness checks. The results for trade remain largely unchanged, although there are differences in income, demographic variables, and employment reflecting that skilled migration responds to different factors than unskilled migration. We use employment visa categories as a proxy for skill levels. Although educational attainment is usually used to measure skill levels in the literature, the KIS data only collect the visa type of foreign residents.

Table 5. Determinants of Bilateral Labor Migration to Korea
(Dependent Variable: Log Labor Migrant Stock)

	(1)	(2)	(3)	(4)	(5)
DV: Foreign worker population				DV: Skilled	DV: Unskilled
Origin income	-0.07 (-0.55)	-0.29** (-2.10)	0.02 (0.09)	0.09 (0.78)	-0.14 (-0.92)
Korea income	1.06*** (2.66)	0.99** (2.44)	1.14** (2.21)	0.01 (0.04)	1.48*** (3.28)
Population	0.81** (2.13)	0.63 (1.63)	1.50** (2.16)	0.04 (0.12)	-0.04 (-0.09)
Origin population 15-29	10.29*** (5.71)	10.39*** (5.45)	12.62*** (4.66)	3.75** (2.42)	14.40*** (6.84)
Korea old age dependency	-0.06 (-0.19)	0.05 (0.14)	0.17 (0.38)	-0.51* (-1.78)	1.24*** (3.19)
Korea unemployment	0.03 (0.81)	0.03 (0.62)	0.05 (0.96)	-0.06 (-1.62)	0.14*** (3.00)
Trade		0.20*** (4.27)		0.13*** (3.35)	0.14*** (2.70)
Trade surplus			0.10** (2.20)		
Trend	0.07 (0.43)	0.01 (0.07)	-0.07 (-0.37)	0.31** (2.43)	-0.60*** (-3.43)
1997 Asian Financial Crisis	0.02 (0.18)	0.01 (0.07)	-0.04 (-0.21)	0.09 (0.86)	0.08 (0.53)
2004 EPS Reform	0.44*** (4.03)	0.48*** (4.32)	0.60*** (4.36)	-0.22** (-2.47)	1.25*** (10.26)
2008 Great Recession	-0.13 (-1.04)	-0.14 (-1.12)	-0.18 (-1.12)	0.01 (0.13)	-0.30** (-2.17)
Constant	-23.87*** (-3.41)	20.16*** (-2.84)	-40.07*** (-3.28)	0.17 (0.03)	-25.50*** (-3.25)
Observations	2,196	2,100	1,488	2,100	2,100
R-squared	0.17	0.17	0.17	0.17	0.17
Number of countries	138	137	125	137	137

Note: all the variables except origin population 15-29, Korea old age dependency, Korea unemployment, and year dummies are transformed into natural logs. t-statistics and z-statistics are in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Economic Opportunities

The income level of the origin country is insignificant except in Model 2. When trade volume is included, origin income is negatively associated with that country's labor migrant population in Korea. According to the estimate in Model 2, a one percent increase in the origin country income leads to a 0.3% decrease in the number of its citizens on labor visas residing in Korea. In contrast, the in-

come level of Korea is consistently significant and positively associated with the foreign labor migrant population except for the skilled workers. The asymmetry here is similar to the work of Mayda (2010), where she found that the income at destination—the per-worker GDP at 14 OECD destination countries (not including Korea)—has a positive and consistent impact on emigration rates, while the impact of the income in the origin country tends to be small and insignificant.

In Model 2, a one percent increase in Korean income raised the bilateral migrant population by one percent. The magnitude is much larger for unskilled migrant workers, where the same process leads to a 1.5 percent increase. It may indicate that skilled migrants are more sensitive to sectoral reward gaps between origin and destination countries when considered with other factors, whereas unskilled migrants are largely driven by simple income differences.

Korean Domestic Factors

The impact of demographic transformation, which includes decreasing fertility rate and increasing life expectancy, is inconsistent, with the coefficients significant only in skill-differentiated Models 4 and 5. Again, skilled migration appears to have a different relationship with Korea's population aging from unskilled migration, which requires further investigation. In Model 5, population aging has a strong impact on migration, implying that a one percent increase in the proportion of the older population over the working-age population led to a 1.2 percent increase in the bilateral resident stock.

Unemployment is probably the most important domestic economic factor to influence migration. The Korean unemployment rate is not significant, except with unskilled migrants (Model 5), and has a positive impact. These results are

not intuitive and probably cannot be directly interpreted. They may indicate that a labor shortage that pulls migrant workers into Korea is sector-specific and requires a disaggregated approach by industry.

Other Source Country Factors

The effect of the coefficient of population is largely positive, as expected. The proportion of the population aged 15-29 has a large and significant impact. The coefficients are significant throughout the models. According to the estimate in Model 2, a one percent increase in the young population share increases migration to Korea from that source country by 10 percent.

Trade Links to Korea

Now we move to the variable of primary interest: trade relations with the source country. For all specifications of trade variables, including trade volume and Korean trade surplus, bilateral trade significantly predicts the size of its migrant population in Korea (Models 2 through 5). The coefficient implies that a one percent increase in trade volume between Korea and the origin country leads to a 0.2 percent increase in its migrant population in Korea (Model 2). Trade surplus has a smaller effect, whereby a one percent increase in Korea's trade surplus leads to a 0.1 percent increase in the migrant population from that country (Model 3).

Policy Shifts and External Shocks

Finally, year dummies appear to have varying effects, among which the introduction of EPS in 2004 consistently had a positive effect across models. This indicates that the resumption of labor migration with the beginning of 2004 ad-

mitted a large number of migrants, and this has contributed to a sharp increase in the migrant population in Korea.

Our evidence also suggests that the migration process may be clearly divided between unskilled and skilled labor migration. For unskilled labor migration, which constitutes the majority of labor migration to Korea, income level and population aging of Korea, demographic pressure in the origin country, and trade links with Korea matter. Unemployment in Korea matters as well, but in a manner contradictory to the standard migration model and common perceptions. The positive relationship between unemployment and foreign population may reflect the mismatch in the Korean labor market and uneven distribution of labor shortage among different economic sectors. It may also be the result of using migration stock data in place of flow data. Skilled migration offers different results with income level and population aging of Korea and time trend, although the rest of the findings are largely similar to those of unskilled migration.

For additional sensitivity analysis, we consider the effects of ethnic migration. We were concerned whether ethnic Korean migrants, especially from China, drive the results due to their large size. We re-estimated the models without ethnic migrants, and the results are largely similar to those reported above. For trade, we also used different specifications concerning exports and imports. The results also stayed similar to those reported.

The empirical results are largely consistent with the migration literature. Yet what is puzzling is the strong association between trade relations and the bilateral stocks of foreign residents. We speculate that trade and migration are positively associated for the following two reasons. The first channel emphasizes the supply side, whereby trade conveys information about Korea to the potential migrants in the origin countries. The second channel is Korea's foreign labor policy, which

works on the demand side. It is important to note that the Korean government annually distributes the quotas for unskilled migrants to Korea, and important trading partners, all else being equal, are likely to receive preferential treatments in the decision process.

VI. Conclusion

The present study offers findings largely consistent with those of previous research on the determinants of migration to the US, the UK, and other OECD countries. Economic fundamentals, especially income opportunities at the destination and demographic pressure in the source country, are important. The findings of previous research on other OECD countries stress economic factors as well as policy constraints. But, largely because there has been no major shift in Korea's migration policies over the past two decades, the effects of migration policies were modest. Although the admission of unskilled workers has been highly regulated by the Korean government, the policy trend has been largely expansionary over the past two decades.

The linkage between trade and migration is a curious one. As discussed earlier, this study does not attempt to inquire into whether migration and trade substitute for or complement each other within the framework of factor mobility. We only analyze the association between migration and trade with respect to Korea and offer the observations that trade, both in volume and surplus to Korea, significantly increases the size of the migrant population from the partner country. We speculate that trade leads to inbound migration through two channels. Economic ties facilitated by trade spread information about Korea, and strong trade relations encourage labor migration policymakers in Korea to award special consideration to the partner country. Substantiating these arguments should be the fo-

cus of future research. Future research should also entail two types of improvements with respect to data. First, it should use disaggregated data on migration and trade to investigate their relationship at the sector level. Second, efforts should be made to use migration flow data by origin country for improved analysis. The present study makes progress in explaining cross-country patterns of labor migration to Korea by analyzing annual data on stocks of foreign resident population by origin. As such, the findings along with the data will likely be modified and revised by future research.

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Appendix

Table A1. Timeline of Korea's Labor Migration Policy Changes

Year	Policy	Commentary
1991	JVTP	precursor to ITTP
1993	ITTP , residence up to two years	-
1994	ITTP expanded to construction, fisheries, horticulture, animal husbandry, and business agriculture	-
1996	ITTP expanded to coastal fishery	-
1997	ITTP expanded to construction	-
2003	Amnesty	-
2003	EPS enacted	-
2004	EPS into effect	EPS, residence up to three years
2006	ITTP ended	-
2007	Visit and Employment Program	-
2008	The First Basic Plan on Foreign Residents 2008-2012	-

Table A2. Employment Visa Categories

Visa	Categories
D3	Industrial Trainee
E1	University Professor
E2	Foreign Language/ English Conversation Teacher
E3	Researcher
E4	Technical Instructor
E5	Professional Consultant
E6	Entertainer
E7	Specially Designated Profession
E8	Employed Trainee
H2	Working visit

Source: Korea Immigration Service.

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국문요약

한국은 1990년대 이후 동아시아의 주요 외국인력 수용국으로 급격히 부상하였다. 이 연구에서는 한국에 대한 노동송출국의 출신국별 결정요인을 1993년부터 2011년까지 출신국별·체류자격별 한국의 국제이주 패널데이터를 이용하여 실증분석하였다. 분석 결과 인력수용국인 한국의 소득수준과 인구구조, 인력송출국의 인구구조가 중요한 역할을 하며 각 변수의 중요성은 숙련인력과 비숙련인력에 따라 다른 것으로 나타났다. 또한 이러한 변수 이외에도 양국간의 교역관계가 출신국별 한국 체류인구의 규모를 설명하는 유의미한 변수라는 결과가 도출되었다. 교역과 노동이주의 밀접한 관계는 교역을 통한 한국 관련 정보확산과 양국의 경제협력이라는 정책적 고려가 작용한 것으로 보이며 향후 보다 정밀한 후속연구가 요구된다.

핵심용어: 국제노동이주, 결정요인, 숙련노동, 비숙련노동

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Determinants of International Labor Migration to Korea

Yoon Ah Oh and Jione Jung

Since the 1990s Korea has emerged as one of the major migration destinations in Asia. This paper represents one of the first attempts to examine the determinants of bilateral labor migration to Korea across source countries and over time. We analyze the effects of economic, demographic, and policy factors. We also examine the role played by trade between Korea and origin countries. The results suggest that economic fundamentals, including income level in Korea, as well as demographic factors both in origin countries and Korea, play an important role, while different patterns are observed for skilled and unskilled migrant workers. We also found that trade is an important predictor of the size and composition of foreign migrant population in Korea. We speculate that trade influences migration to Korea through the information effect and foreign labor policy channel.

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