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【要旨】

This paper examines the short-run and long-run impacts of immigrants on local amenities in South Korea using data on 229 municipalities from 2010 to 2019. Specifically, this paper attempts to investigate the differential effects of ethnic Korean and non-ethnic-Korean immigrants by exploiting the unique case of ethnic return migration in Korea. The results suggest that ethnic Korean immigrants have a negative effect on cultural facilities in the long run, while non-Korean immigrants have no effect on local amenities. It is also found that an inflow of ethnic Korean immigrants does not significantly affect the inflow of native Koreans, while 10 additional non-Korean immigrants lead to a net inflow of one to two native Koreans into the municipality.

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Differential Impacts of Ethnic Korean and Non-Korean Immigrants on Local Amenities in South Korea*

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August 2025

Abstract

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Key Words: immigration, amenities, South Korea
JEL Codes: F22, J15, J61, R23

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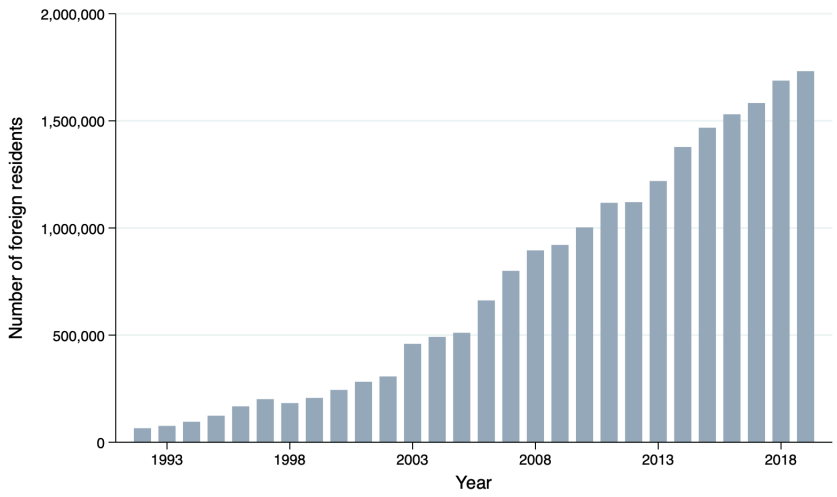
1. Introduction

Immigration has become one of the important challenges faced by an increasing number of countries in recent years. The labor shortage is one of the many reasons that has been driving such a global trend. South Korea is not an exception to this trend, as the number of immigrants in the country has also been increasing, especially since the 2000s (Figure 1). Although Korea is not a traditionally immigrant-receiving country like the U.S. or Canada, the fact that the immigrant populations in the country have been growing recently leaves much room for investigation.

Figure 1: Number of foreign residents in South Korea



Notes: The figure shows the number of long-term foreign residents in South Korea, including ethnic Koreans from all origin countries. Long-term foreign residents are defined as those whose periods of stay are more than 90 days. The data are from the Statistics of Registered Foreigners and the Status of Overseas Koreans' Report of Domestic Residence of the Ministry of Justice.

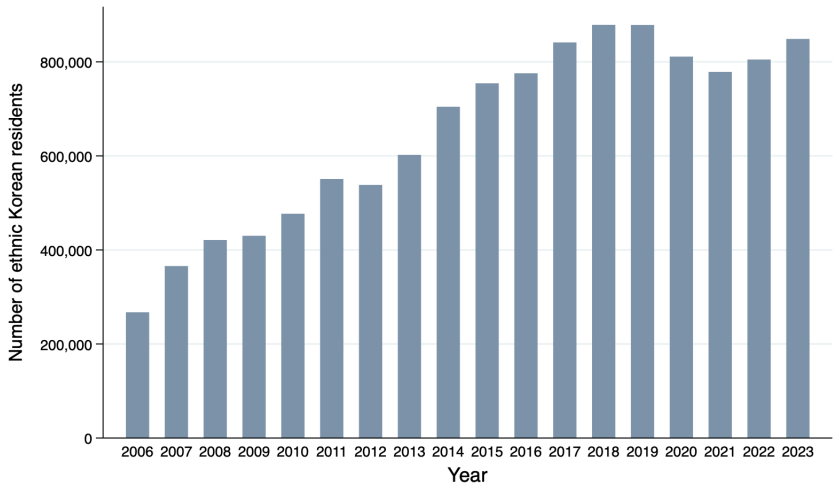
As shown in Figure 2, one striking feature of the immigration cases in South Korea is that a great number of the immigrants are ethnically Korean (Han et al., 2022). These ethnic Koreans (or overseas Koreans) commonly refer to the descendants of the individuals (and individuals themselves) who once held Korean nationality but had emigrated from the country. In 1999, the Korean government launched a new visa program, called the overseas Korean

visa (F-4), to encourage the resettlement of ethnic Koreans in hopes of a faster economic recovery after the Korean Financial Crisis of 1997 (Kim, n.d.). Initially, however, the eligible individuals for the F-4 visa only included those who emigrated after the year 1948, leaving out a large majority of ethnic Koreans in China and the Commonwealth of Independent States (CIS) that mostly emigrated in the early 20th century (Kim, n.d.). Although this restriction on the emigration period was later repealed in 2003, ethnic Koreans from China and the CIS region were still excluded from eligibility by the Korean government due to concerns about their potential adverse effects on the Korean labor market (Han et al., 2022). In 2008, after a number of amendments, the eligibility for the F-4 status was finally expanded to include the ethnic Koreans from the respective regions (Han et al., 2022). This policy change eventually led to a huge inflow of ethnic Koreans from these regions into the country.

In immigration literature, one area that is often visited is the labor market effects of immigrants on the host country. For example, while some studies find that immigration hurts native wages (Borjas, 2003; Dustmann et al., 2017), others reveal that immigration has either no effect (Edo, 2015) or a positive effect on native wages (Kim et al., 2022). The focus of this paper, however, lies on the amenity effects of immigrants, a topic that is less commonly examined in the literature. Here, amenities refer to any features of a neighborhood that make the neighborhood a more attractive place to live. These could include natural amenities (e.g., level of pollution), public amenities (e.g., schools, roads, or transportation), or cultural amenities (e.g., recreational activities). The motivation to explore such an area especially comes from the findings by Kim et al. (2022) that low-skilled immigration has negative effects on a set of local amenities in the South Korean context. The local amenities visited by these authors mostly consist of social infrastructure, such as daycare facilities, senior centers, and cultural facilities, which are considered as the essentials that determine the quality of life of individuals. There also exist other papers that analyze the impacts of immigrants on other types of neighborhood amenities. For instance, Price and Feldmeyer (2012) document that immigrants do not affect the level of air pollution in the U.S. context. Other papers on the U.S. have also revealed that low-skilled immigrants have positive effects on the likelihood of elderly natives aging in place (Butcher et al., 2022; Huh et al., 2024) and the quality of care at nursing homes

(Furtado and Ortega, 2023). Spenkuch (2014) finds that a higher share of immigrants has led to an increase in property crime rates but has had no effect on violent crime rates at the county level.

Figure 2: Number of total ethnic Korean residents



Notes: The figure shows the number of short-term and long-term ethnic Korean residents from all origin countries. The data are from the Yearbook of Korea Immigration Statistics of the Ministry of Justice.

This paper looks into the short-run and long-run effects of immigration on local amenities in South Korea using a panel dataset of 229 municipalities between 2010 and 2019. In general, population growth in a neighborhood drives an increase in amenities due to increased demand. However, the findings of this paper suggest that while immigrants do not significantly affect local amenities in the short run, they lead to a lower number of cultural facilities in the long run. This paper further investigates whether these effects differ between ethnic Korean and non-Korean immigrants. While this paper does not necessarily hold a stance, one reason as to why one might be interested in the difference in the effects between the two groups of immigrants may include the shared characteristics between ethnic Koreans and native Koreans in terms of language, cultural practices, and, due to shared ancestry, physical characteristics. As an example, Brunner and Kuhn (2018) also examine the differential voting behaviors of natives towards immigration policies in the Swiss context by using the

local shares of immigrants that are "culturally different" and "culturally similar." This paper attempts to take a similar approach by comparing how the effects of ethnic Koreans (who are culturally similar to natives) and non-Korean immigrants (who are culturally different) differ on local amenities.

The similarities between ethnic Koreans and native Koreans may allow ethnic Koreans to have comparative advantages over non-Korean immigrants in "blending in" to Korean society upon arrival, such as by having greater access to more diverse job opportunities compared to non-Korean immigrants (Youn and Jin, 2011). If, for example, the decline in local amenities in immigration-affected neighborhoods is driven by native flight or avoidance due to social or economic factors, then native Koreans may respond differently to ethnic Korean and non-Korean immigrants. Since ethnic Koreans 'resemble' native Koreans, they may not trigger a native flight response in the same way that non-Korean immigrants might. A similar finding has also been revealed by Brunner and Kuhn (2018) in the Swiss context that natives tend to be more anti-immigration if the local share of culturally different immigrants is higher, whereas the share of culturally similar immigrants has no effect on natives' voting behaviors. If this is the case, one would expect ethnic Korean immigrants to have little to no effect on local amenities, whereas non-Korean immigrants may lead to native outflows and, hence, changes in amenities. For ethnic Korean immigrants, this paper specifically focuses on Korean Chinese populations (also known as *Joseonjok*), since (1) an overwhelming majority of ethnic Korean residents in Korea come from China (Figure 3) and (2) the data on Korean Chinese are most abundantly available compared to ethnic Koreans of other nationalities (e.g., *Goryeoin*).

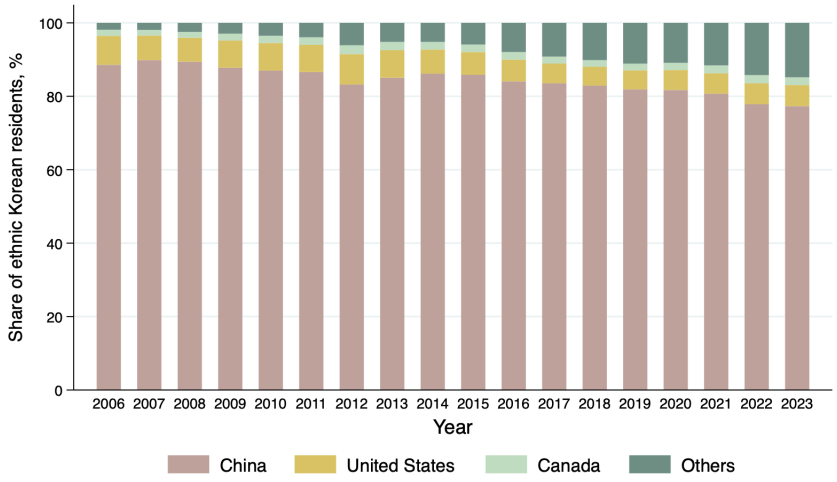
For such an approach (i.e., comparing the differential amenity effects of ethnic Korean and non-Korean immigrants) to be feasible, however, there must also exist clear differences between these two types of immigrants. In fact, the differences between ethnic Korean and non-Korean immigrants, beyond just their culture and ethnicity, have been documented several times in the *Survey on Immigrants' Living Conditions and Labour Force*, which is an annual survey jointly conducted by the Ministry of Justice and Statistics Korea on a sample of 20,000 immigrant residents and 5,000 naturalized citizens in Korea. For example, the 2024

survey reveals that ethnic Korean residents are, on average, older than non-Korean immigrant residents. While this survey does not report every result by respondents' nationalities, it does publish the results by respondents' residence status (i.e., type of visa). Since those who can apply for the H-2 (work and visit) and F-4 (overseas Korean) visas only include ethnic Koreans residing overseas, this paper assumes that the respondents of the survey on both the H-2 and F-4 visas roughly represent the ethnic Korean demographics in Korea. Non-professional foreign workers (E-9) and professional foreign workers (E-1, E-2, ..., E-7), on the other hand, are assumed to approximately represent the non-Korean immigrant population in Korea, based on the finding of the survey that none of the Korean Chinese respondents are holding the above visas as of 2024.

Besides the average age, it has also been found that the share of high school graduates is the highest for both ethnic Korean and non-professional non-Korean immigrant workers, while the majority of professional non-Korean immigrant workers have had some college education and above (Statistics Korea, 2024a). When it comes to residential locations, it is found that almost 80% of ethnic Korean immigrants (both those on H-2 and F-4) stay in the Seoul Metropolitan Area, which includes Seoul Metropolitan City, Gyeonggi Province, and Incheon Metropolitan City. While a large number of non-Korean immigrant workers also reside in the Seoul Metropolitan Area, the share of Seoul residents has been small (0.6% for non-professional workers and 16.3% for professional workers), as most of them are concentrated in Gyeonggi Province. The most popular reasons for staying in their current residential locations have also varied across the types of immigrants: Family-related reasons for ethnic Korean immigrants and job-related reasons for non-Korean immigrants. Regarding the labor force participation rate, the share of employed non-Korean immigrants has been significantly higher than the share of employed ethnic Korean immigrants. Not only that, but ethnic Korean immigrants have also accounted for 25.1% of the unemployed immigrant population, as well as 26.3% of the economically inactive immigrant population. While the mining and manufacturing industries have been popular industries of work for both ethnic and non-Korean immigrants, the average monthly income has been higher for ethnic Korean workers than non-Korean workers. Lastly, the self-evaluated level of Korean proficiency has been higher

among ethnic Korean immigrants (3.8 for H-2 holders and 4.2 for F-4 holders out of 5) than non-Korean immigrants (2.8 for both professional and non-professional workers). This paper thus believes that such differences between ethnic Korean and non-Korean populations in Korea, as well as the resemblance between ethnic Korean and native Korean populations, allow this paper to delve into the differential effects of these immigrants on amenities in local Korean municipalities.

Figure 3: Share of total ethnic Korean residents by nationality



Notes: The figure shows the share of short-term and long-term ethnic Korean residents by nationality. The data are from the Yearbook of Korea Immigration Statistics of the Ministry of Justice.

When the amenity effects are differentially estimated, however, the results seem to suggest that ethnic Korean immigrants are the main drivers of the long-run negative effects of total immigrants on local cultural facilities. Non-Korean immigrants, on the other hand, do not exert statistically significant effects on local amenities in the long run. A decreasing number of local infrastructure could be attributed to a number of factors. One is that the demand for the infrastructure declines due to a decrease in neighborhood populations in general. In fact, several studies have found that an immigration inflow into a neighborhood affects the mobility patterns of natives. While some papers find no significant effect of immigrants on population mobility (Edo, 2020; Peri and Zaiour, 2023), others report that immigrants could

either attract native workers (Hong and McLaren, 2015) or repel natives from the region. This native flight response may be dominated by either a greater out-migration of natives (Crowder et al., 2011; Accetturo et al., 2014; Hall and Crowder, 2014) or a reduced in-migration of natives (Beine and Coulombe, 2018; Amior, 2021). Some papers expand on this approach by analyzing whether different types of natives respond differentially to immigration inflows. The studies on South Korea demonstrate that immigrants tend to attract natives for work-related reasons but repel natives for non-work-related reasons (Han et al., 2022; Kim et al., 2022). The papers on Italy, on the other hand, focus on the educational attainment of natives and discover that immigrants attract high-skilled natives but not low-skilled natives (Mocetti and Porello, 2010; Basile et al., 2021). It should, however, be noted that the shutdown of local infrastructure may also be caused by other factors, such as the rising costs of maintenance or the cutback of government budgets if the infrastructure is publicly funded. The question of identifying the mechanisms behind the decreasing number of cultural facilities in response to ethnic Korean immigrants is, therefore, left for future research.

By analyzing the differential impacts of ethnic Korean and non-Korean immigrants on local amenities using the unique case of ethnic return migration in South Korea, this paper contributes to the strand of literature on the impact of immigrants on a host country's local socioeconomic outcomes. Further, this paper contributes to the nascent body of immigration literature focused on countries that are not traditionally immigrant-receiving. Lastly, this paper also attempts to contribute to the literature on the effects of immigrants on native internal mobility by exploring whether the mobility response of native Koreans differs by type of immigrants (ethnically Korean or not). The findings suggest that non-Korean immigrants attract natives into the municipality, but ethnic Korean immigrants do not.

The rest of the paper is structured as follows. Section 2 describes the empirical approach of this paper. Sections 3 and 4 give an overview of the historical background and data, respectively. Section 5 presents the regression results. Section 6 provides a discussion on potential mechanisms behind the observed results. Section 7 concludes the paper.

2. Empirical approach

This paper begins by analyzing the amenity effects of total immigrants (including both ethnic Koreans and non-Koreans) to reinforce the findings by Kim et al. (2022). Then, the paper proceeds to identify whether there exists any heterogeneity between the effects of ethnic Koreans and non-Korean immigrants. The baseline specification of this paper is described below, following Kim et al. (2022).

$$\Delta \ln y_{c,t} = \alpha_0 + \alpha_1 \Delta Mig_{c,t} + \alpha_2 X_{c,t-1} + \gamma_c + \delta_t + \epsilon_{c,t} \tag{1}$$

$$\Delta \ln y_{c,t} = \beta_0 + \beta_1 \Delta Mig^{KOR}_{c,t} + \beta_2 \Delta Mig^{OTH}_{c,t} + \beta_3 X_{c,t-1} + \gamma_c + \delta_t + \epsilon_{c,t} \tag{2}$$

where $\Delta \ln y_{c,t}$ indicates the log changes in the local amenity measures of municipality c in year t. There are eight amenity measures taken into account: (1) Daycare facilities, (2) elementary schools, (3) senior centers, (4) private tutoring facilities, (5) social welfare facilities, (6) cultural facilities, (7) waste emission, and (8) traffic culture index. This list of local amenities is largely inspired by Kim et al. (2022). The definitions of the respective amenities are reported in Table 1.

The explanatory variable $\Delta Mig_{c,t}$ in equation (1) measures the change in the number of total immigrants in municipality c, relative to the municipality-level population in year $t-1$. This paper defines "immigrants" as individuals of non-Korean nationality whose periods of stay in Korea exceed 90 days ("long-term foreign residents"). The immigration variables in equation (2) are defined in the same way, except that $\Delta Mig^{KOR}_{c,t}$ only measures each municipality's exposure to ethnic Korean (Korean Chinese) immigrants, whereas $\Delta Mig^{OTH}_{c,t}$ measures the exposure to all other immigrants that are not ethnically Koreans. Formally, the variables are expressed as:

$$\Delta Mig_{c,t} = \frac{Mig_{c,t} - Mig_{c,t-1}}{Pop_{c,t-1}} \tag{3}$$

$$\Delta Mig_{c,t}^{KOR} = \frac{Mig_{c,t}^{KOR} - Mig_{c,t-1}^{KOR}}{Pop_{c,t-1}} \tag{4}$$

$$\Delta Mig_{c,t}^{OTH} = \frac{Mig_{c,t}^{OTH} - Mig_{c,t-1}^{OTH}}{Pop_{c,t-1}} \tag{5}$$

The specifications include a vector of control variables, $X_{c,t-1}$, which includes (1) the change in the number of native residents relative to the initial population, (2) the log of initial local tax collection, (3) the log of initial population density, (4) the initial share of elderly (65+) population, (5) the initial share of urban population, and (6) the initial share of female workers. By "initial year," this paper is referring to the year $t-1$. The terms γ_c and δ_t each indicate municipality and year fixed effects, respectively. These fixed effects are included for the short-run analysis only, which is a panel regression using yearly data from 2010 to 2019. The long-run analysis, on the other hand, is a long difference regression that spans from 2010 to 2019. The error terms are denoted by $\epsilon_{c,t}$ and $\varepsilon_{c,t}$. All regressions are weighted by initial populations.

2.1. Instrumental variables

Since the geographical distribution of immigrants is often correlated with various local shocks, it is important to address the endogeneity issues in identifying the causal effects of immigrants on local amenities. This paper attempts to address such concern by constructing "shift-share" instruments, following the past literature (e.g., Card, 2009; Peri et al., 2015; Edo, 2020; Sasahara et al., 2023). The instruments are constructed as follows:

$$\Delta\widehat{Mig_{c,t}} = \frac{\sum_{e=1}^{11} \frac{Mig_{c,e,2006}}{Mig_{e,2006}} \times (Mig_{e,t} - Mig_{e,t-1})}{Pop_{c,t-1}} \tag{6}$$

$$\Delta\widehat{Mig_{c,t}^{KOR}} = \frac{\left(\frac{Mig_{c,2006}^{KOR}}{Mig_{2006}^{KOR}}\right) \times (Mig_{t}^{KOR} - Mig_{t-1}^{KOR})}{Pop_{c,t-1}} \tag{7}$$

$$\widehat{\Delta Mig_{c,t}^{OTH}} = \frac{\sum_{e=1}^{10} \frac{Mig_{c,e,2006}^{OTH}}{Mig_{e,2006}^{OTH}} \times (Mig_{e,t}^{OTH} - Mig_{e,t-1}^{OTH})}{Pop_{c,t-1}} \quad (8)$$

The first term of each instrumental variable indicates the spatial distribution of immigrants from each origin (ethnic) group e across Korean municipalities in 2006. The list of origin (ethnic) groups is shown in Table A1. The equation (6) includes the immigrants from all 11 origin (ethnic) groups, whereas the equation (7) only consists of Korean Chinese immigrants. The equation (8) includes immigrants from all origin (ethnic) groups, except for Korean Chinese immigrants. The ethnic enclaves of immigrants as of 2006 are then interacted with the national changes in the number of immigrants from each origin (ethnic) group e during the period of interest (2010-2019). To keep the consistency with the key explanatory variables, the interaction terms are further standardized by the municipality-level population measured at year $t-1$.

For the instruments to be valid, the literature states that either the "share" or the "shift" components of the instrument must be exogenous (i.e., uncorrelated with unobserved determinants of the outcome variables after controlling for other factors) (e.g., Goldsmith-Pinkham et al., 2020; Borusyak et al., 2022). This paper attempts to reduce the correlation between the "shares" and the error terms in both the short-run and long-run specifications by including various control variables that may have influenced the past settlement patterns of immigrants. The inclusion of year fixed effects in the short-run analysis further helps this paper to control for any national trends in immigration affected by relevant policies. This thus implies that the national "shifts" in the number of immigrants are also considered exogenous for the short-run analysis. Moreover, considering that the expansion of the F-4 visa program in 2008 had been a sudden policy shock, this paper argues that the subsequent inflows of Korean Chinese immigrants in the 2010-2019 period (used for the "shift" in ethnic Koreans) are also exogenous.

3. Background

In the late 1980s, South Korea experienced a large-scale labor movement (known as the Great Labor Uprising of 1987), which led to an increase in wages, especially among blue-collar jobs. The overall improvement in quality of life then eventually led to severe labor shortages in the relevant sectors (Yoon, 2008). As a result, in 1991, the Korean government embarked on a new program to bring foreign workers into the country, called the Industrial Trainee System. Initially, only foreign-invested enterprises were eligible to participate in the system, but it was later expanded in 1993 so that other SMEs could also participate (Yoon, 2008). This policy shock led to a gradual increase in foreign residents in the country until the Korean Financial Crisis of 1997. While the number of immigrants in Korea declined during the financial crisis, the number started to rise again, along with the economic recovery.

One of the interesting features of immigrants in South Korea is that a large number of them are found to be ethnic Koreans. Behind this trend exist the Korean government's endeavors to enhance the economic recovery after the Korean Financial Crisis, by bringing back overseas (ethnic) Koreans into the country. To do so, the Korean government introduced the overseas Korean visa (F-4) program in 1999, which grants eligible individuals essentially semi-permanent residential rights in Korea (Kim et al., 2022). While the length of stay is determined up to two years upon issuance, it can be easily renewed unless the individual has any history of default or infringement. Those with F-4 status can also engage in various economic activities with some restrictions on manual labor or illegal activities.

The F-4 visa program was initiated by the enactment of the Act on the Immigration and Legal Status of Overseas Koreans. During the early days, however, those who had emigrated from Korea before 1948 were excluded from eligibility. This led to the exclusion of ethnic Koreans in China and the CIS region, since a lot of them had emigrated in the early 20th century. In 2003, this restriction was removed, but ethnic Koreans from the respective regions were still left ineligible due to the concerns by the Korean government on their potential effects on the Korean labor market (Han et al., 2022). Their eligibility to apply for the F-4 visa was finally provided in 2008, after a series of policy changes (Han et al., 2022). In addition

to this visa program, several other efforts were also made by the Korean government, such as the implementation of the Exceptionally Permissible Employment Permit System in 2002. This system allowed ethnic Koreans who had been invited by their relatives residing in South Korea to work in various service industries on an H-2 visa (Ryu, n.d.). These efforts have collectively contributed to the subsequent inflows of ethnic Korean immigrants in the 2000s.

4. Data

This paper conducts empirical analyses on a total of 229 municipalities in South Korea. These municipalities belong to the second-level administrative division in Korea and are identified as either a city (*Si*), county (*Gun*), or district (*Gu*). For simplicity, this paper refers to relevant geographical units as "municipalities." The focus of this paper is on long-term foreign residents (immigrants) in each municipality whose periods of stay are more than 90 days.

This paper obtains most of the immigration data from the Statistics of Registered Foreigners by the Ministry of Justice. This dataset records the number of long-term foreign residents in each municipality. However, the dataset does not include information on ethnic Korean (Korean Chinese) residents in F-4 status. Therefore, additional data on the Status of Overseas Koreans' Report of Domestic Residence from the Ministry of Justice are collected to supplement the immigration dataset.

The data on the eight amenity measures come from a variety of sources. The data on the number of daycare facilities and senior centers come from the Ministry of Health and Welfare. For education-related amenities (i.e., the number of elementary schools and private tutoring facilities), the data are acquired from the Korean Educational Development Institute. The data on social welfare facilities, cultural facilities, waste emission, and traffic culture index are each collected from the Ministry of the Interior and Safety, the Ministry of Culture, Sports and Tourism, the Ministry of Environment, and the Ministry of Land, Infrastructure and Transport, respectively. The traffic culture index, as suggested by its name, evaluates how safe and secure the traffic culture of a municipality is, based on the 18 indicators. The index is published every year in all 229 municipalities across Korea.

Lastly, this paper also collects data on various control variables from multiple sources. The number of native Korean residents (excluding those residing abroad) and the elderly population comes from the Ministry of the Interior and Safety. The data on urban population and municipality area are obtained from Korea Land and Geospatial Informatix Corporation. Using the data on the total population (that includes both immigrants and natives) and municipality area (in square kilometers), population densities are computed. The data on the number of female workers come from the Ministry of Employment and Labor. To control for the income level across municipalities, the data on local tax collection from each local government are also taken into account.

4.1. Descriptive statistics

Figure 4 illustrates the spatial distribution of immigration inflow from 2010 to 2019. The variable displayed in the map is the change in the number of immigrants (both ethnic Koreans and non-Korean immigrants) in each Korean municipality between 2010 and 2019, relative to the municipality population in 2010. It shows that over the 2010-2019 period, there have been large inflows of immigrants into the Seoul Metropolitan Area (which includes the capital city) as well as the Busan-Gyeongnam Area (which includes the second largest city of South Korea, Busan). Interestingly, slight inflows of immigrants are also observed along the coast. Figure 5 depicts the geographical distribution of ethnic Korean (Korean Chinese) and non-Korean immigrants separately during the same period. While the Seoul Metropolitan Area and Busan-Gyeongnam Area are still the two popular destinations for both immigrant groups, it seems that ethnic Korean immigrants tend to be more concentrated around the Seoul Metropolitan Area than non-Korean immigrants, who are also found to settle around the southwestern coastal areas. Table 2 reports the aggregate immigration shocks ($\Sigma_{t\in T}\Delta Mig_{c,t}$, $\Sigma_{t\in T}\Delta Mig^{KOR}_{c,t}$, and $\Sigma_{t\in T}\Delta Mig^{OTH}_{c,t}$) for each municipality in descending order from 2010 to 2019. The cells shaded in light gray indicate municipalities in the Seoul Metropolitan Area (Gyeonggi Province and Incheon Metropolitan City), whereas the cells shaded in gray indicate municipalities in Seoul Metropolitan City. This once again shows that, compared to

Table 1: List of local (dis)amenities

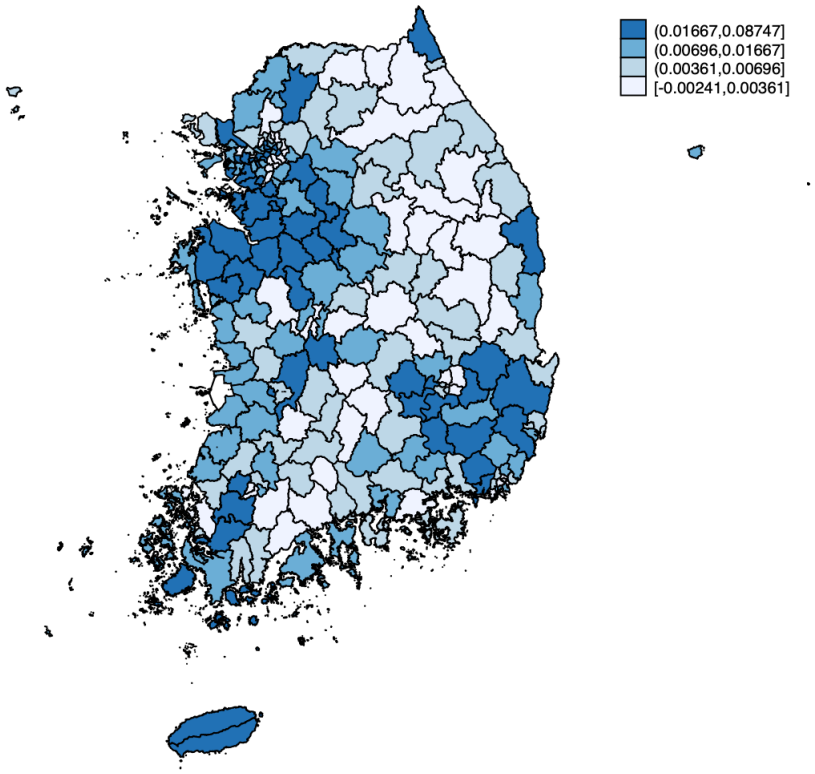
(Dis)amenities	Definition
Daycare facilities	Daycare facilities of all kinds (public, private, corporate, etc.)
Elementary schools	Elementary schools of all kinds (public and private)
Senior centers	Leisure and welfare facilities for the elderly
Private tutoring facilities	Facilities that offer tutoring services to groups of learners, exceeding a minimum number set by Presidential Decree, for more than 30 days
Social welfare facilities	Facilities that offer welfare services (e.g., protection, life guidance, rehabilitation, and leisure activities) to improve the quality of life for vulnerable groups in the community
Cultural facilities	Cultural facilities of all kinds (library, museum, art gallery, theaters, etc.)
Waste emission	Municipal solid waste (kg/day)
Traffic culture index	An index that scores driver and pedestrian behavior out of 100, based on 18 indicators across three categories: Driving habits, pedestrian behavior, and traffic safety

Notes: The table defines each amenity variable used in this paper. Each definition comes from the Ministry of Health and Welfare (daycare facilities and senior centers), Korean Educational Development Institute (elementary schools and private tutoring facilities), Ministry of the Interior and Safety (social welfare facilities), Ministry of Culture, Sports and Tourism (cultural facilities), Ministry of Environment (waste emission), and the Ministry of Land, Infrastructure and Transport (traffic culture index).

non-Korean immigrants, ethnic Korean immigrants are slightly more clustered around the Seoul Metropolitan Area.

Figure A1 compares the age demographics of immigrants and natives in the 2010-2019 period. It shows that on average, immigrant residents in South Korea are relatively younger than the native residents, as around 60% of the immigrants are in their 20s and 30s throughout the period. This also suggests that immigrants in Korea are mainly those of working age. Moreover, as shown in Figure A2, there exists a slightly higher share of male immigrants than

Figure 4: Geographical allocation of immigrants in South Korea



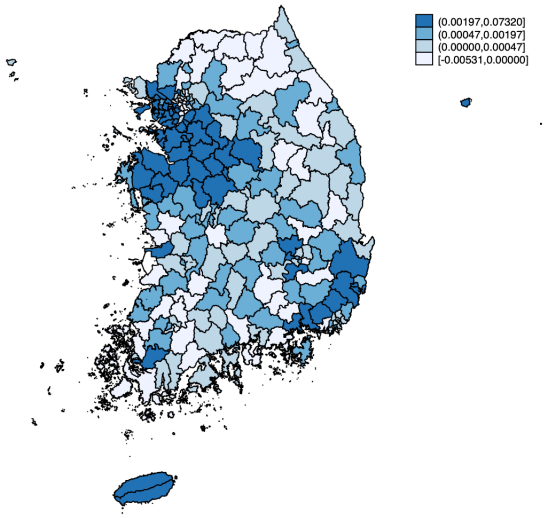
Notes: The figure illustrates the changes in the number of long-term foreign residents (including ethnic Koreans from all origin countries) between 2010 and 2019, relative to the population in 2010. The data are from the Statistics of Registered Foreigners and the Status of Overseas Koreans' Report of Domestic Residence of the Ministry of Justice.

female immigrants in Korea. Lastly, Figure A3 presents the level of educational attainment of immigrants and natives. The displayed variable is the share of individuals with some college education and above. In general, native Koreans are more highly educated than immigrants (i.e., immigration in Korea can be described as low-skilled immigration).

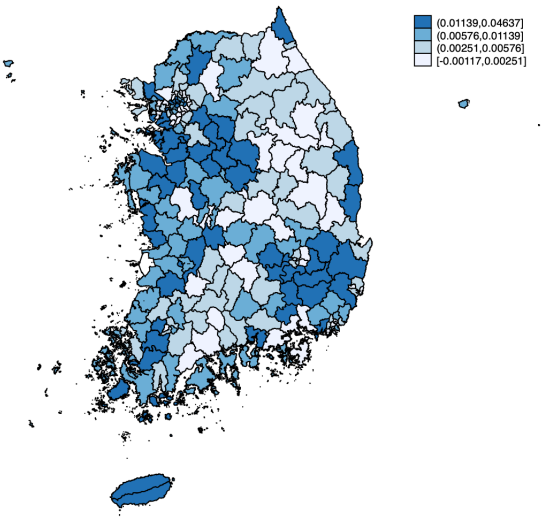
Table 3 presents summary statistics of the variables used in the empirical analyses. Panel A reports summary statistics of amenity variables. Between 2010 and 2019, the average changes in the number of daycare facilities per person and private tutoring facilities per person have been negative. This phenomenon may be correlated with the declining birth rates of the country. Panel B summarizes the key explanatory variables, whereas Panel C summarizes the shift-share instrumental variables. While the average growth in immigrant popula-

Figure 5: Geographical allocation of ethnic Korean and non-Korean immigrants

Panel A: Ethnic Korean (Korean Chinese) immigrants



Panel B: Non-Korean immigrants



Notes: Panel A (Panel B) illustrates the changes in the number of long-term Korean Chinese (non-Korean) immigrant residents between 2010 and 2019, relative to the population in 2010. The data are from the Statistics of Registered Foreigners and the Status of Overseas Koreans' Report of Domestic Residence of the Ministry of Justice.

tions has generally been positive throughout the period, the size of the growth remains small. Panel D shows summary statistics of the control variables. Additional summary statistics are presented in Table A2.

4.2. First-stage results

Table 4 presents the first-stage regression results on Δln(daycare facilities per person) for the short-run specification that includes controls, municipality fixed effect, and year fixed effect. Column (1) regresses ΔMig on $\Delta\widehat{Mig}$. Columns (2) and (4) each run regressions of ΔMig^{KOR} and ΔMig^{OTH} on $\Delta\widehat{Mig^{KOR}}$ and $\Delta\widehat{Mig^{OTH}}$, respectively, whereas columns (3) and (5) include both instruments simultaneously. The literature often suggests that instruments are considered weak if the first-stage F-statistic is lower than 10 (Staiger and Stock, 1997). Columns (1), (2), and (4) each display high first-stage F-statistics of 79.76, 111.76, and 60.2, respectively, indicating the validity of the instruments.

Table 2: Summary of municipality-level immigration shocks

	Total immigrants $\Sigma_{t\in T}\Delta Mig_{c,t}$		Ethnic Korean immigrants $\Sigma_{t\in T}\Delta Mig^{KOR}_{c,t}$		Non-Korean immigrants $\Sigma_{t\in T}\Delta Mig^{OTH}_{c,t}$	
1	Siheung-si	0.0843	Siheung-si	0.0705	Seogwipo-si	0.0431
2	Jincheon-gun	0.0693	Osan-si	0.0468	Eumseong-gun	0.0418
3	Eumseong-gun	0.0674	Guro-gu	0.0392	Jindo-gun	0.0375
4	Ansan-si	0.0608	Geumcheon-gu	0.0388	Jincheon-gun	0.0349
5	Asan-si	0.0589	Ansan-si	0.0336	Wando-gun	0.0307
114	Jangheung-gun	0.0069	Goheung-gun	0.0005	Yangpyeong-gun	0.0055
115	Mokpo-si	0.0068	Saha-gu	0.0005	Dalseo-gu	0.0055
225	Seocho-gu	-0.0009	Hongcheon-gun	-0.0029	Gangnam-gu	-0.0004
226	Yanggu-gun	-0.0012	Cheorwon-gun	-0.0032	Dong-gu, Incheon	-0.0004
227	Danyang-gun	-0.0014	Yongsan-gu	-0.0038	Gwacheon-si	-0.0008
228	Gwacheon-si	-0.0019	Yanggu-gun	-0.0051	Gongju-si	-0.0008
229	Gangnam-gu	-0.0024	Jongno-gu	-0.0054	Danyang-gun	-0.0012

Notes: The table shows the sum of immigration shock variables for total immigrants ($\Sigma_{t\in T}\Delta Mig_{c,t}$), ethnic Korean immigrants ($\Sigma_{t\in T}\Delta Mig^{KOR}_{c,t}$), and non-Korean immigrants ($\Sigma_{t\in T}\Delta Mig^{OTH}_{c,t}$), in the 2010-2019 period for the top five, median, and bottom five municipalities. The unit of the variables is the change in the number of immigrants from each group relative to the initial municipality-level population. The cells shaded in light gray and gray each indicate municipalities in the Seoul Metropolitan Area (Gyeonggi Province and Incheon Metropolitan City) and Seoul Metropolitan City, respectively.

Moreover, the coefficients in the respective columns are all highly statistically significant at the 1% level and have magnitudes close to or slightly greater than one. This indicates that the instruments have a high predictive power of actual immigration inflows. The coefficients of opposite signs on $\Delta\widehat{Mig^{KOR}}$ and $\Delta\widehat{Mig^{OTH}}$ in columns (3) and (5) also suggest that the variations in each endogenous variable are mainly explained by its respective instrument, with limited influence from the other instrument. The instruments in the long-run specification are also found to be sufficiently strong (as shown in Table 5), although the first-stage F-statistics and the coefficients are slightly smaller. The first-stage results for both short-run and long-run specifications stay consistent across the dependent variables. The first-stage fits are reported in Figures A4 (short-run) and A5 (long-run).

Table 3: Summary statistics

	Obs.	Mean	St. Dev.	Min	Max
Panel A: Dependent Variables					
Δ ln(daycare facilities per person)	2,061	-0.002	0.060	-0.684	0.349
Δ ln(elementary schools per person)	2,061	0.0002	0.026	-0.251	0.181
Δ ln(senior centers per person)	2,061	0.009	0.113	-1.365	1.376
Δ ln(private tutoring facilities per person)	2,059	-0.005	0.180	-2.462	2.378
Δ ln(social welfare facilities per person)	2,061	0.032	0.172	-2.623	1.872
Δ ln(cultural facilities per person)	2,061	0.047	0.108	-0.476	1.042
Δ ln(waste emission per person)	2,061	0.018	0.204	-2.041	2.204
Δ ln(traffic culture index)	2,022	0.002	0.092	-0.571	0.550
Panel B: Explanatory Variables					
ΔMig	2,061	0.001	0.002	-0.019	0.019
ΔMig^{KOR}	2,061	0.0003	0.002	-0.011	0.018
ΔMig^{OTH}	2,061	0.001	0.002	-0.018	0.014
Panel C: Instrumental Variables					
$\Delta\widehat{Mig}$	2,061	0.001	0.002	-0.003	0.016
$\Delta\widehat{Mig^{KOR}}$	2,061	0.0005	0.001	-0.004	0.015
$\Delta\widehat{Mig^{OTH}}$	2,061	0.001	0.001	-0.0001	0.008
Panel D: Control Variables					
$\Delta Native$	2,061	0.001	0.025	-0.102	0.359
Initial ln(local tax collection)	2,061	11.718	1.243	8.376	14.987
Initial ln(population density)	2,061	6.484	2.145	2.967	10.268
Initial share of elderly population	2,061	0.178	0.078	0.053	0.389
Initial share of urban population	2,061	0.738	0.274	0.000	1.000
Initial share of female workers	2,061	0.413	0.067	0.197	0.595

Notes: Author's own calculation.

5. Results

5.1. Short-run analysis

Table A3 reports the OLS results in the short run. The 2SLS results are presented in Table 6. Panel A shows the effects of total immigrants, whereas Panel B shows the differential effects of ethnic Koreans and non-Korean immigrants. The coefficients on $\Delta Native$, defined as the change in the number of native residents in a municipality relative to the initial population,

Table 4: First-stage regression results (short-run)

	ΔMig	ΔMig^{KOR}		ΔMig^{OTH}	
	(1)	(2)	(3)	(4)	(5)
$\Delta\widehat{Mig}$	1.20***				
	(0.13)				
$\Delta\widehat{Mig^{KOR}}$		1.31***	1.31***		-0.07***
		(0.12)	(0.12)		(0.02)
$\Delta\widehat{Mig^{OTH}}$			-0.20	0.86***	0.88***
			(0.18)	(0.11)	(0.11)
F-statistic on excluded instruments	79.76	111.76	57.02	60.2	43.62
Observations	2,061	2,061	2,061	2,061	2,061
R-squared	0.49	0.73	0.74	0.09	0.09

Notes: The table shows the first-stage regression results on Δln(daycare facilities per person). The first-stage results stay consistent across the dependent variables. All regressions include controls, municipality fixed effect, and year fixed effect. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

Table 5: First-stage regression results (long-run)

	ΔMig	ΔMig^{KOR}		ΔMig^{OTH}	
	(1)	(2)	(3)	(4)	(5)
$\Delta\widehat{Mig}$	0.87***				
	(0.18)				
$\Delta\widehat{Mig^{KOR}}$		0.87***	0.84***		0.27***
		(0.15)	(0.14)		(0.07)
$\Delta\widehat{Mig^{OTH}}$			0.19	0.43***	0.39***
			(0.22)	(0.09)	(0.09)
F-statistic on excluded instruments	22.54	33.15	19.16	21.31	21.29
Observations	229	229	229	229	229
R-squared	0.42	0.35	0.36	0.35	0.39

Notes: The table shows the first-stage regression results on Δln(daycare facilities per person). The first-stage results stay consistent across the dependent variables. All regressions include controls and are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

are reported alongside for comparison purposes.

Columns (1)-(7) of Tables A3 and 6 regress the log changes in amenities per person on

immigration variables. The purpose of this approach is to examine how much of the amenities that can be enjoyed by one person have changed in response to immigration. If the amount of amenities that can be enjoyed by one person had decreased, one may be able to argue that such a change signals a "downgrade" of the quality of respective amenities. Since the traffic culture index is calculated based on the performance of the municipality residents, this paper assumes that any changes in the municipality population have already been reflected in the index.

In the short run, a one-percent increase in total immigrants relative to the initial population is found to be associated with a 1.3% decrease in daycare facilities per person, a 1.9% decrease in elementary schools per person, and a 3.8% decrease in senior centers per person (Panel A). Similar estimates are observed for ethnic Koreans but not for non-Korean immigrants (Panel B). It is, however, important to note that local amenities per person can be affected by both (1) changes in the absolute number of amenities and (2) changes in the local population. Considering that the short-run analysis of this paper investigates a year-on-year change, a one-year window may not be enough time frame for social infrastructure (e.g., schools) to adjust to immigration. Hence, these results may be mere short-lived effects due to a sudden expansion of local populations. This can also explain the negative effects of native Koreans on local amenities in the short run, as reported in both Panels A and B.

To demonstrate whether immigration has an actual negative impact on local amenities in the short run, Table 7 re-runs the 2SLS regressions using the log changes in the absolute number of amenities. The OLS results are presented in Table A4. It would only make sense to reach the aforementioned conclusion if the coefficients in Tables 6 and 7 both stay consistently negative and statistically significant. However, the estimates become statistically insignificant once the alternative dependent variables are used, in contrast to the coefficients on $\Delta Native$. This suggests that the negative effects of immigrants in the short run are simply driven by increased populations in the municipality. While the effect of non-Korean immigrants on the number of social welfare facilities remains positive, the large magnitude of the coefficient suggests that this result should also be interpreted with caution. Figure A6, which illustrates the sum of yearly log changes in social welfare facilities from 2010 to 2019, shows

that there has been a notable regional variation. While some areas (e.g., Seoul Metropolitan Area and Busan-Gyeongnam Area) experience substantial increases in social welfare infrastructure, others show little to no change. This heterogeneity thus suggests that the observed overall effect may have been driven by the clusters of non-Korean immigrant populations in specific regions rather than a uniform nationwide trend.

Table 6: Short-run impact of immigrants on local amenities per person (2SLS)

Panel A: Total Immigrants								
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig	-1.29*	-1.88***	-3.84*	0.17	-1.12	-1.22	1.11	-0.42
	(0.678)	(0.618)	(2.143)	(1.414)	(3.171)	(1.549)	(3.799)	(1.342)
$\Delta Native$	0.01	-0.46***	-0.16	-0.80***	-0.61***	-0.94***	-0.64	0.03
	(0.086)	(0.058)	(0.272)	(0.195)	(0.214)	(0.181)	(0.492)	(0.106)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061	2,022
C.-D. Wald *F*-statistic	1057.239	1057.239	1057.239	1056.090	1057.239	1057.239	1057.239	1036.143
K.-P. rk Wald *F*-statistic	79.764	79.764	79.764	79.767	79.764	79.764	79.764	79.579
Panel B: Ethnic Koreans and Non-Koreans								
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig^{KOR}	-1.22*	-1.89***	-3.72*	0.22	-1.77	-1.03	1.13	-0.52
	(0.627)	(0.620)	(1.959)	(1.279)	(3.291)	(1.497)	(3.805)	(1.372)
ΔMig^{OTH}	-5.95	-1.54	-11.30	-2.78	42.91**	-13.88	-0.22	6.15
	(4.473)	(2.553)	(17.608)	(14.381)	(21.816)	(10.730)	(19.999)	(6.130)
$\Delta Native$	0.03	-0.46***	-0.12	-0.78***	-0.88***	-0.87***	-0.63	-0.01
	(0.093)	(0.057)	(0.270)	(0.229)	(0.255)	(0.194)	(0.503)	(0.108)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061	2,022
C.-D. Wald *F*-statistic	35.820	35.820	35.820	35.776	35.820	35.820	35.820	34.823
K.-P. rk Wald *F*-statistic	31.351	31.351	31.351	31.347	31.351	31.351	31.351	30.671

Notes: This table focuses on the number of amenities per person, except for column (8). All regressions include controls, municipality fixed effect, and year fixed effect. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

5.2. Long-run analysis

To analyze how the amenity effects of immigrants change over a longer time window, this paper further conducts a long-difference regression between 2010 and 2019. The OLS results are presented in Tables A5 and A6, whereas the 2SLS results are shown in Tables 8 and 9.

Table 7: Short-run impact of immigrants on the total number of local amenities (2SLS)

Panel A: Total Immigrants							
	Δln(daycare facilities)	Δln(elementary schools)	Δln(senior centers)	Δln(private tutoring facilities)	Δln(welfare facilities)	Δln(cultural facilities)	Δln(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig	-0.30	-0.89	-2.85	1.17	-0.12	-0.22	2.10
	(0.679)	(0.617)	(2.147)	(1.415)	(3.172)	(1.547)	(3.798)
$\Delta Native$	0.95***	0.48***	0.78***	0.15	0.33	-0.001	0.30
	(0.093)	(0.054)	(0.268)	(0.189)	(0.216)	(0.175)	(0.508)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061
C.-D. Wald F-statistic	1057.239	1057.239	1057.239	1056.090	1057.239	1057.239	1057.239
K.-P. rk Wald F-statistic	79.764	79.764	79.764	79.767	79.764	79.764	79.764
Panel B: Ethnic Koreans and Non-Koreans							
	Δln(daycare facilities)	Δln(elementary schools)	Δln(senior centers)	Δln(private tutoring facilities)	Δln(welfare facilities)	Δln(cultural facilities)	Δln(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig^{KOR}	-0.23	-0.89	-2.73	1.21	-0.78	-0.03	2.12
	(0.627)	(0.619)	(1.964)	(1.279)	(3.293)	(1.496)	(3.801)
ΔMig^{OTH}	-4.92	-0.51	-10.26	-1.75	43.94**	-12.85	0.81
	(4.464)	(2.537)	(17.616)	(14.393)	(21.802)	(10.731)	(20.002)
$\Delta Native$	0.98***	0.48***	0.82***	0.16	0.06	0.08	0.31
	(0.099)	(0.053)	(0.264)	(0.225)	(0.256)	(0.189)	(0.518)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061
C.-D. Wald F-statistic	35.820	35.820	35.820	35.776	35.864	35.820	35.820
K.-P. rk Wald F-statistic	31.351	31.351	31.351	31.347	31.351	31.351	31.351

Notes: This table focuses on the absolute number of amenities. All regressions include controls, municipality fixed effect, and year fixed effect. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

Similar to the short-run analysis, this paper looks into the long-run estimates on both the number of amenities per person and the absolute number of amenities. The results in Table 8 suggest that in the long run, total immigration inflows are associated with a decrease in the densities of daycare facilities, elementary schools, private tutoring facilities, and cultural facilities. However, Table 9 shows that it is only the cultural facilities that have experienced an actual decrease in number in response to immigration. The analysis further reveals that this negative impact on local cultural facilities seems to be driven by ethnic Korean immigrants (Panel B of Tables 8 and 9), while non-Korean immigrants do not seem to have significant effects on local amenities in the long run. Additionally, it is also found that the inflows of ethnic-Korean immigrants have led to a lower number of private tutoring facilities in the

municipality.

Table 8: Long-run impact of immigrants on local amenities per person (2SLS)

Panel A: Total Immigrants								
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig	-3.19**	-2.12***	-0.85	-2.28*	2.87	-6.05**	3.31	-0.58
	(1.558)	(0.761)	(0.649)	(1.183)	(2.987)	(2.506)	(2.721)	(0.698)
$\Delta Native$	0.23***	-0.23**	-0.61***	0.26***	-0.54***	-0.12	-0.11	0.02
	(0.068)	(0.093)	(0.023)	(0.082)	(0.121)	(0.118)	(0.141)	(0.022)
Observations	229	229	229	229	229	229	229	224
C.-D. Wald F-statistic	91.072	91.072	91.072	91.072	91.072	91.072	91.072	88.991
K.-P. rk Wald F-statistic	22.541	22.541	22.541	22.541	22.541	22.541	22.541	22.408
Panel B: Ethnic Koreans and Non-Koreans								
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig^{KOR}	6.05	0.45	0.17	-8.17**	-10.71	-17.52***	-5.16	-1.39
	(4.753)	(1.547)	(2.071)	(3.611)	(7.487)	(5.154)	(6.398)	(1.897)
ΔMig^{OTH}	-17.27*	-6.24*	-2.49	6.02	23.29	9.85	16.30	0.51
	(9.089)	(3.224)	(2.768)	(6.339)	(16.772)	(12.452)	(11.433)	(2.790)
$\Delta Native$	0.40***	-0.18*	-0.59***	0.16	-0.79***	-0.33	-0.26	0.001
	(0.148)	(0.108)	(0.032)	(0.102)	(0.250)	(0.219)	(0.210)	(0.036)
Observations	229	229	229	229	229	229	229	224
C.-D. Wald F-statistic	7.357	7.357	7.357	7.357	7.357	7.357	7.357	7.154
K.-P. rk Wald F-statistic	3.845	3.845	3.845	3.845	3.845	3.845	3.845	3.801

Notes: This table focuses on the number of amenities per person, except for column (8). All regressions include controls. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

5.3. Native mobility

Despite the statistical insignificance, the coefficients of non-Korean immigrants are found to be less negative than those of ethnic Koreans on some of the amenities (e.g., private tutoring facilities, welfare facilities, cultural facilities, and traffic culture) in the long run. This suggests that non-Korean immigrants may have less adverse effects on these amenities than ethnic Koreans do in the long run, which is counterintuitive, considering the comparative advantages held by ethnic Koreans in social integration. The finding that ethnic Koreans do not yield similar effects to those of native Koreans despite their shared characteristics is also counterintuitive. One potential explanation for such results may be due to the difference in

Table 9: Long-run impact of immigrants on the total number of local amenities (2SLS)

Panel A: Total Immigrants							
	Δln(daycare facilities)	Δln(elementary schools)	Δln(senior centers)	Δln(private tutoring facilities)	Δln(welfare facilities)	Δln(cultural facilities)	Δln(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig	-1.61	-0.54	0.72	-0.71	4.44	-4.48*	4.88*
	(1.736)	(0.532)	(0.841)	(1.322)	(3.040)	(2.349)	(2.674)
$\Delta Native$	0.84***	0.39***	0.004	0.88***	0.07	0.49***	0.51***
	(0.136)	(0.026)	(0.112)	(0.171)	(0.128)	(0.110)	(0.097)
Observations	229	229	229	229	229	229	229
C.-D. Wald F-statistic	91.072	91.072	91.072	91.072	91.072	91.072	91.072
K.-P. rk Wald F-statistic	22.541	22.541	22.541	22.541	22.541	22.541	22.541
Panel B: Ethnic Koreans and Non-Koreans							
	Δln(daycare facilities)	Δln(elementary schools)	Δln(senior centers)	Δln(private tutoring facilities)	Δln(welfare facilities)	Δln(cultural facilities)	Δln(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig^{KOR}	6.17	0.58	0.30	-8.04*	-10.58	-17.39***	-5.03
	(4.505)	(1.387)	(2.622)	(4.129)	(7.932)	(5.386)	(6.623)
ΔMig^{OTH}	-13.32	-2.29	1.46	9.97	27.24	13.80	20.25*
	(8.889)	(2.166)	(4.018)	(7.802)	(17.712)	(13.105)	(11.349)
$\Delta Native$	0.99***	0.41***	-0.004	0.75***	-0.20	0.26	0.33**
	(0.214)	(0.036)	(0.137)	(0.199)	(0.243)	(0.201)	(0.147)
Observations	229	229	229	229	229	229	229
C.-D. Wald F-statistic	7.357	7.357	7.357	7.357	7.357	7.357	7.357
K.-P. rk Wald F-statistic	3.845	3.845	3.845	3.845	3.845	3.845	3.845

Notes: This table focuses on the absolute number of amenities. All regressions include controls. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

native Koreans' mobility response towards ethnic Koreans (Korean Chinese) and non-Korean immigrants. This paper thus investigates whether native Koreans differentially respond to the inflows of ethnic Koreans and non-Korean immigrants in the long run by using the Internal Migration Statistics provided by Statistics Korea. This dataset counts how many native Koreans have moved in and out of a municipality based on their move-in registration, which must be completed upon moving. While foreign residents in South Korea should also report their new place of residence once they move, the relevant administrative process for foreigners differs from that for natives. Hence, the Internal Migration Statistics do not include the number of foreign residents who have moved in or out of a municipality.

In analyzing the native mobility response, this paper uses three dependent variables: (1)

The number of natives who moved in, (2) the number of natives who moved out, and (3) the net number of natives who moved in (i.e., native in-migration – native out-migration). These native migration variables are then standardized by the population in 2010 for consistency with the immigration variables. The regressions also include additional control variables: (1) the log change in employment between 2010 and 2019 and (2) the log of the apartment price index in 2010. The 2SLS results are separately presented for total immigrants (Table 10) and for ethnic Korean and non-Korean immigrants (Table 11). Since a lot of municipalities have missing data on the apartment price index, this control is only included in columns (2), (4), and (6). The OLS results are documented in Tables A7 and A8.

Table 10 reveals that in the long run, immigrants tend to attract natives into the municipality: An inflow of 10 additional immigrants has led to an inflow of 6 natives (net inflow of 3-4 natives). This finding is consistent with some of the past literature (e.g., Hong and McLaren, 2015). From Table 11, however, it is found that such inflow of natives is mostly driven by non-Korean immigrants. While 10 additional non-Korean immigrants have led to an inflow of 3 natives (net inflow of 1-2 natives), the effects of ethnic Korean immigrants on native mobility are generally negative and statistically insignificant. The findings that native Koreans tend to respond more positively towards the inflow of non-Korean immigrants rather than that of ethnic Korean immigrants, thus, potentially explain the less adverse effects of non-Korean immigrants on some of the local amenities.

5.4. Robustness checks

5.4.1. Exclusion of Chinese immigrants

In fact, in addition to the large number of Korean Chinese immigrants residing in Korea, a high share of non-Korean immigrants are known to be Chinese nationals as well. Hence, there also exists a possibility where the above results may have been mainly driven by Chinese immigrants in local communities. To find out whether such is the case, this paper further conducts additional analyses using alternative immigration variables that do not include Chinese immigrants. The methodology stays consistent as in previous sections.

Table 10: Long-run impact of total immigrants on native mobility (2SLS)

	Native In-migration		Native Out-migration		Native Net-migration	
	(1)	(2)	(3)	(4)	(5)	(6)
ΔMig	0.61	0.68*	0.20	0.28	0.41**	0.39*
	(0.401)	(0.400)	(0.242)	(0.233)	(0.202)	(0.205)
Initial ln(local tax collection)	0.004	0.01	0.001	0.004	0.003	0.003
	(0.005)	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)
Initial ln(population density)	-0.001	-0.004	0.001	-0.001	-0.002*	-0.003*
	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)
Initial share of elderly population	-0.12	0.05	-0.15**	-0.02	0.03	0.07
	(0.107)	(0.136)	(0.068)	(0.088)	(0.053)	(0.075)
Initial share of urban population	0.06**	0.07	0.03*	0.04	0.03*	0.03
	(0.030)	(0.045)	(0.019)	(0.028)	(0.015)	(0.025)
Initial share of female workers	-0.08	-0.06	-0.04	-0.03	-0.04	-0.04
	(0.064)	(0.066)	(0.042)	(0.041)	(0.031)	(0.034)
Δ ln(employment)	0.19***	0.14***	0.12***	0.08***	0.07***	0.07***
	(0.063)	(0.032)	(0.043)	(0.018)	(0.022)	(0.018)
Initial ln(apartment price index)		0.02		0.004		0.02*
		(0.015)		(0.010)		(0.011)
Observations	229	122	229	122	229	122
C.-D. Wald F-statistic	100.558	75.442	100.558	75.442	100.558	75.442
K.-P. rk Wald F-statistic	25.662	30.433	25.662	30.433	25.662	30.433

Notes: The dependent variables are the number of natives who moved in, the number of natives who moved out, and the net number of natives who moved in, each relative to the initial population. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

The short-run OLS results for amenities per person and total number of amenities are each reported in Tables A9 and A10. Tables 12 and 13, on the other hand, present the 2SLS results for the short-run specification. The 2SLS results reveal that the signs and the magnitudes of the coefficients stay relatively consistent as Tables 6 and 7, which report the results from the main analyses. Even in the case where Chinese immigrants are excluded from the regression, immigrants in the short run do not seem to largely affect local amenities. This paper still observes a positive impact of non-Korean and non-Chinese immigrants on social welfare facilities.

Similarly, the long-run 2SLS results also stay consistent as the main analyses (Tables 14 and 15). In general, non-Chinese immigrants (including ethnic Korean immigrants) have

Table 11: Long-run impact of ethnic Korean and non-Korean immigrants on native mobility (2SLS)

	Native In-migration		Native Out-migration		Native Net-migration	
	(1)	(2)	(3)	(4)	(5)	(6)
ΔMig^{KOR}	-0.44	-1.08	0.05	-0.34	-0.49	-0.74
	(0.722)	(0.711)	(0.622)	(0.543)	(0.386)	(0.507)
ΔMig^{OTH}	2.14	3.86**	0.45	1.43	1.69*	2.44*
	(1.457)	(1.773)	(0.906)	(0.935)	(0.900)	(1.290)
Initial ln(local tax collection)	0.004	0.005	0.001	0.003	0.002	0.002
	(0.005)	(0.006)	(0.003)	(0.003)	(0.003)	(0.003)
Initial ln(population density)	0.0003	-0.002	0.001	-0.001	-0.001	-0.002
	(0.003)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)
Initial share of elderly population	-0.21*	-0.40	-0.17**	-0.18	-0.04	-0.22
	(0.121)	(0.250)	(0.079)	(0.146)	(0.071)	(0.185)
Initial share of urban population	0.05*	0.08	0.03*	0.04	0.02	0.04
	(0.029)	(0.055)	(0.017)	(0.030)	(0.017)	(0.035)
Initial share of female workers	-0.09	-0.05	-0.04	-0.02	-0.05	-0.03
	(0.061)	(0.061)	(0.041)	(0.038)	(0.032)	(0.035)
Δ ln(employment)	0.18***	0.12***	0.12**	0.07***	0.06***	0.05**
	(0.065)	(0.034)	(0.046)	(0.019)	(0.022)	(0.020)
Initial ln(apartment price index)		0.02		0.002		0.02
		(0.018)		(0.011)		(0.011)
Observations	229	122	229	122	229	122
C.-D. Wald F-statistic	9.220	4.078	9.220	4.078	9.220	4.078
K.-P. rk Wald F-statistic	5.051	2.835	5.051	2.835	5.051	2.835

Notes: The dependent variables are the number of natives who moved in, the number of natives who moved out, and the net number of natives who moved in, each relative to the initial population. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

negative effects on local cultural facilities in the long run. Ethnic Korean immigrants seem to be the main driver of such results. Non-Korean and non-Chinese immigrants, on the other hand, do not significantly affect local amenities in the long run. When Chinese immigrants are excluded from the mobility analyses, again, the results remain consistent with the main results. It is still found that non-Korean and non-Chinese immigrants overall attract natives into the municipality. Ethnic Korean immigrants, on the other hand, are not found to trigger further inflows of natives. These results suggest the overall robustness of the main findings of this paper.

Table 12: Short-run impact of immigrants (excl. Chinese) on local amenities per person (2SLS)

Panel A: Total Immigrants (excl. Chinese)								
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig	-1.30*	-1.84***	-3.62*	0.38	-1.50	-1.23	0.78	-0.47
	(0.663)	(0.610)	(2.104)	(1.393)	(3.136)	(1.547)	(3.629)	(1.326)
$\Delta Native$	0.01	-0.46***	-0.17	-0.80***	-0.61***	-0.94***	-0.64	0.03
	(0.086)	(0.057)	(0.270)	(0.195)	(0.214)	(0.181)	(0.492)	(0.106)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061	2,022
C.-D. Wald F-statistic	1235.924	1235.924	1235.924	1234.620	1235.924	1235.924	1235.924	1211.325
K.-P. rk Wald F-statistic	85.285	85.285	85.285	85.292	85.285	85.285	85.285	85.084
Panel B: Ethnic Koreans and Non-Koreans (excl. Chinese)								
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig^{KOR}	-1.18*	-1.85***	-3.53*	0.35	-2.29	-0.93	0.95	-0.59
	(0.608)	(0.613)	(1.887)	(1.252)	(3.295)	(1.538)	(3.749)	(1.359)
ΔMig^{OTH}	-7.22	-0.98	-7.96	1.56	41.06*	-17.27	-8.44	6.19
	(4.400)	(2.948)	(20.971)	(16.941)	(24.057)	(12.051)	(20.229)	(6.587)
$\Delta Native$	0.04	-0.47***	-0.15	-0.80***	-0.84***	-0.86***	-0.59	-0.01
	(0.092)	(0.057)	(0.262)	(0.235)	(0.248)	(0.200)	(0.509)	(0.108)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061	2,022
C.-D. Wald F-statistic	37.500	37.500	37.500	37.457	37.500	37.500	37.500	36.376
K.-P. rk Wald F-statistic	27.262	27.262	27.262	27.259	27.262	27.262	27.262	26.554

Notes: This table focuses on the number of amenities per person, except for column (8). All regressions include controls, municipality fixed effect, and year fixed effect. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

5.5. Additional analyses: Immigration and local labor market outcomes

This section presents additional analyses of the impacts of ethnic Korean and non-Korean immigrants on local employment in the long run. To empirically assess how these immigrants affect the local level of employment in the 2010-2019 period, this paper collects further data from the Census on Establishments by the Ministry of Employment and Labor. This dataset documents the total number of employees across local establishments at the municipality level. The dataset also provides information by industry. The number of civil servants, self-employed, and unpaid workers is excluded from the dataset.

Table 13: Short-run impact of immigrants (excl. Chinese) on the total number of local amenities (2SLS)

Panel A: Total Immigrants (excl. Chinese)							
	Δln(daycare facilities)	Δln(elementary schools)	Δln(senior centers)	Δln(private tutoring facilities)	Δln(welfare facilities)	Δln(cultural facilities)	Δln(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig	-0.31	-0.85	-2.63	1.36	-0.51	-0.25	1.77
	(0.665)	(0.608)	(2.106)	(1.393)	(3.138)	(1.543)	(3.626)
$\Delta Native$	0.95***	0.48***	0.77***	0.14	0.33	-0.00	0.30
	(0.093)	(0.054)	(0.267)	(0.190)	(0.216)	(0.175)	(0.507)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061
C.-D. Wald F-statistic	1235.924	1235.924	1235.924	1234.620	1235.924	1235.924	1235.924
K.-P. rk Wald F-statistic	85.285	85.285	85.285	85.292	83.533	85.285	85.285
Panel B: Ethnic Koreans and Non-Koreans (excl. Chinese)							
	Δln(daycare facilities)	Δln(elementary schools)	Δln(senior centers)	Δln(private tutoring facilities)	Δln(welfare facilities)	Δln(cultural facilities)	Δln(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig^{KOR}	-0.20	-0.87	-2.55	1.33	-1.31	0.05	1.93
	(0.608)	(0.611)	(1.892)	(1.252)	(3.299)	(1.535)	(3.742)
ΔMig^{OTH}	-6.15	0.09	-6.89	2.63	42.13*	-16.20	-7.37
	(4.393)	(2.935)	(20.964)	(16.956)	(24.045)	(12.036)	(20.226)
$\Delta Native$	0.98***	0.48***	0.79***	0.14	0.10	0.08	0.36
	(0.099)	(0.054)	(0.258)	(0.231)	(0.248)	(0.195)	(0.524)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061
C.-D. Wald F-statistic	37.500	37.500	37.500	37.457	35.864	37.500	37.500
K.-P. rk Wald F-statistic	27.262	27.262	27.262	27.259	27.262	27.262	27.262

Notes: This table focuses on the absolute number of amenities. All regressions include controls, municipality fixed effect, and year fixed effect. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

5.5.1. Local employment by gender

Table 18 reports the long-run impact of ethnic Korean and non-Korean immigrants on local employment by gender. Columns (1)-(3) present OLS results, whereas columns (4)-(6) show 2SLS results. The dependent variables are log changes in total employment, log changes in female employment, and log changes in male employment, respectively. The regressions consist of the same set of control variables as the main analysis. The results, however, seem to suggest that immigrants do not significantly affect local employment in the long run, although positive coefficients are observed for ethnic Korean immigrants, in contrast to the negative

Table 14: Long-run impact of immigrants (excl. Chinese) on local amenities per person (2SLS)

Panel A: Total Immigrants (excl. Chinese)								
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig	-3.62**	-2.48***	-1.03	-2.80*	3.55	-7.20**	3.85	-0.75
	(1.824)	(0.911)	(0.795)	(1.451)	(3.547)	(3.051)	(3.216)	(0.830)
$\Delta Native$	0.23***	-0.23**	-0.61***	0.26***	-0.55***	-0.12	-0.11	0.02
	(0.068)	(0.093)	(0.024)	(0.084)	(0.121)	(0.120)	(0.142)	(0.022)
Observations	229	229	229	229	229	229	229	224
C.-D. Wald F-statistic	74.750	74.750	74.750	74.750	74.750	74.750	74.750	72.881
K.-P. rk Wald F-statistic	18.749	18.749	18.749	18.749	18.749	18.749	18.749	18.584
Panel B: Ethnic Koreans and Non-Koreans (excl. Chinese)								
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig^{KOR}	0.89	-1.39	-0.54	-6.32***	-3.93	-14.54***	-0.35	-1.19
	(2.864)	(0.902)	(1.485)	(2.276)	(3.969)	(3.301)	(3.892)	(1.366)
ΔMig^{OTH}	-14.89**	-5.58*	-2.40	4.66	21.64	7.99	14.44	0.12
	(6.996)	(2.912)	(2.387)	(5.119)	(14.092)	(9.937)	(9.675)	(2.379)
$\Delta Native$	0.33***	-0.20**	-0.60***	0.19**	-0.72***	-0.28*	-0.20	0.01
	(0.107)	(0.101)	(0.025)	(0.085)	(0.190)	(0.169)	(0.178)	(0.027)
Observations	229	229	229	229	229	229	229	224
C.-D. Wald F-statistic	15.405	15.405	15.405	15.405	15.405	15.405	15.405	14.973
K.-P. rk Wald F-statistic	7.958	7.958	7.958	7.958	7.958	7.958	7.958	7.834

Notes: This table focuses on the number of amenities per person, except for column (8). All regressions include controls. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

coefficients of non-Korean immigrants. Between female and male workers, the coefficients of male immigrant workers are found to be more positive and insignificant than those of female immigrant workers.

While there could be several potential mechanisms behind such insignificant results, one may be due to the gradual assimilation of these immigrants over the period. Moreover, it should also be noted that this analysis uses data on total local employment, which include the employment statistics of both natives and immigrants. Hence, while native employment itself may be negatively affected by immigration, as is the case in some of the previous literature (e.g., Dustmann et al., 2017; Edo, 2015), the effect of immigration on the employment of the overall population seems to be insignificant in this paper.

Table 15: Long-run impact of immigrants (excl. Chinese) on the total number of local amenities (2SLS)

Panel A: Total Immigrants (excl. Chinese)							
	Δln(daycare facilities)	Δln(elementary schools)	Δln(senior centers)	Δln(private tutoring facilities)	Δln(welfare facilities)	Δln(cultural facilities)	Δln(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig	-1.76	-0.61	0.84	-0.93	5.42	-5.34*	5.71*
	(2.025)	(0.627)	(1.018)	(1.604)	(3.630)	(2.857)	(3.149)
$\Delta Native$	0.84***	0.39***	0.00	0.88***	0.07	0.49***	0.51***
	(0.136)	(0.026)	(0.111)	(0.172)	(0.127)	(0.113)	(0.097)
Observations	229	229	229	229	229	229	229
C.-D. Wald F-statistic	74.750	74.750	74.750	74.750	74.750	74.750	74.750
K.-P. rk Wald F-statistic	18.749	18.749	18.749	18.749	18.749	18.749	18.749
Panel B: Ethnic Koreans and Non-Koreans (excl. Chinese)							
	Δln(daycare facilities)	Δln(elementary schools)	Δln(senior centers)	Δln(private tutoring facilities)	Δln(welfare facilities)	Δln(cultural facilities)	Δln(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig^{KOR}	2.17	-0.11	0.74	-5.04**	-2.65	-13.26***	0.93
	(2.833)	(0.932)	(1.702)	(2.390)	(4.085)	(3.170)	(3.988)
ΔMig^{OTH}	-11.23	-1.91	1.27	8.32	25.30*	11.65	18.11*
	(7.122)	(1.953)	(3.543)	(6.289)	(14.743)	(10.234)	(9.273)
$\Delta Native$	0.93***	0.40***	0.00	0.79***	-0.12	0.32**	0.40***
	(0.181)	(0.030)	(0.127)	(0.181)	(0.177)	(0.144)	(0.110)
Observations	229	229	229	229	229	229	229
C.-D. Wald F-statistic	15.405	15.405	15.405	15.405	15.405	15.405	15.405
K.-P. rk Wald F-statistic	7.958	7.958	7.958	7.958	7.958	7.958	7.958

Notes: This table focuses on the absolute number of amenities. All regressions include controls. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

5.5.2. Local employment by sector

This section analyzes the effects of ethnic Korean and non-Korean immigrants on primary, secondary, and tertiary sector employment. This paper categorizes the industries that appear in the Census on Establishments dataset into three sectors as follows. The primary sector includes agriculture, forestry, fishing, and mining industries, whereas the secondary sector consists of manufacturing, construction, and public utilities (e.g., electricity) industries. Lastly, the tertiary sector refers to various service industries. Table 19 provides a more detailed list of the industries that belong to each sector. The regression results are presented in Table 20.

Table 16: Long-run impact of total immigrants (excl. Chinese) on native mobility (2SLS)

	Native In-migration		Native Out-migration		Native Net-migration	
	(1)	(2)	(3)	(4)	(5)	(6)
ΔMig	0.72	0.80*	0.24	0.34	0.48**	0.46*
	(0.474)	(0.470)	(0.290)	(0.277)	(0.236)	(0.238)
Initial ln(local tax collection)	0.00	0.01	0.00	0.00	0.00	0.00
	(0.005)	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)
Initial ln(population density)	-0.00	-0.00	0.00	-0.00	-0.00	-0.00*
	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)
Initial share of elderly population	-0.10	0.08	-0.14**	-0.00	0.05	0.08
	(0.109)	(0.137)	(0.070)	(0.090)	(0.054)	(0.076)
Initial share of urban population	0.07**	0.07	0.03*	0.04	0.03**	0.03
	(0.031)	(0.048)	(0.019)	(0.029)	(0.016)	(0.026)
Initial share of female workers	-0.08	-0.06	-0.04	-0.02	-0.04	-0.04
	(0.066)	(0.067)	(0.043)	(0.042)	(0.031)	(0.034)
Δ ln(employment)	0.19***	0.14***	0.12***	0.08***	0.07***	0.06***
	(0.064)	(0.033)	(0.043)	(0.018)	(0.022)	(0.018)
Initial ln(apartment price index)		0.03*		0.00		0.02*
		(0.015)		(0.010)		(0.011)
Observations	229	122	229	122	229	122
C.-D. Wald F-statistic	82.532	61.795	82.532	61.795	82.532	61.795
K.-P. rk Wald F-statistic	21.146	23.711	21.146	23.711	21.146	23.711

Notes: The dependent variables are the number of natives who moved in, the number of natives who moved out, and the net number of natives who moved in, each relative to the initial population. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

Column (4) reveals that in the long run, a one-percent increase in ethnic Korean immigrants relative to the initial population is associated with a 51% increase in primary sector employment in the municipality. While this coefficient may appear large, it is important to note that the average change in ethnic Korean population relative to the initial municipality population in Korea is approximately 0.03% (Table 3). Using a back-of-the-envelope calculation, this suggests that, on average, an increase in ethnic Korean immigrants that is equivalent to 0.03% of the initial population in Korea is associated with roughly a 1.5% increase in local primary sector employment. Their effect on secondary and tertiary sector employment, however, is found to be statistically insignificant (with negative coefficients). Similarly, the effect of non-Korean immigrant workers on local employment also seems to be insignificant

Table 17: Long-run impact of ethnic Korean and non-Korean immigrants (excl. Chinese) on native mobility (2SLS)

	Native In-migration		Native Out-migration		Native Net-migration	
	(1)	(2)	(3)	(4)	(5)	(6)
ΔMig^{KOR}	0.18	-0.03	0.18	0.04	0.00	-0.07
	(0.508)	(0.489)	(0.450)	(0.380)	(0.239)	(0.281)
ΔMig^{OTH}	2.03	3.38**	0.43	1.28	1.59**	2.10**
	(1.351)	(1.404)	(0.848)	(0.796)	(0.783)	(0.963)
Initial ln(local tax collection)	0.00	0.01	0.00	0.00	0.00	0.00
	(0.005)	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)
Initial ln(population density)	0.00	-0.00	0.00	-0.00	-0.00	-0.00
	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)
Initial share of elderly population	-0.13	-0.16	-0.15**	-0.09	0.02	-0.07
	(0.104)	(0.157)	(0.069)	(0.108)	(0.055)	(0.101)
Initial share of urban population	0.07**	0.10*	0.03*	0.05	0.03**	0.05
	(0.031)	(0.055)	(0.019)	(0.032)	(0.016)	(0.032)
Initial share of female workers	-0.07	-0.05	-0.04	-0.02	-0.04	-0.03
	(0.065)	(0.062)	(0.043)	(0.040)	(0.031)	(0.033)
Δ ln(employment)	0.18***	0.12***	0.12**	0.07***	0.06***	0.05***
	(0.067)	(0.032)	(0.046)	(0.018)	(0.023)	(0.018)
Initial ln(apartment price index)		0.03		0.00		0.02**
		(0.016)		(0.011)		(0.011)
Observations	229	122	229	122	229	122
C.-D. Wald F-statistic	17.867	9.763	17.867	9.763	17.867	9.763
K.-P. rk Wald F-statistic	9.744	6.313	9.744	6.313	9.744	6.313

Notes: The dependent variables are the number of natives who moved in, the number of natives who moved out, and the net number of natives who moved in, each relative to the initial population. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

across sectors, with negative coefficients on the primary and secondary sectors and a positive coefficient on the tertiary sector.

5.5.3. Local employment within secondary sector

Since South Korea's economy heavily relies on manufacturing industries, this paper further investigates how ethnic Korean and non-Korean immigrants affect local employment within the secondary sector, which includes manufacturing, construction, and public utilities industries. The results reported in Table 21 suggest that both ethnic Korean and non-Korean

Table 18: Long-run impact of ethnic Korean and non-Korean immigrants on local employment by gender

	OLS			2SLS		
	Total	Female	Male	Total	Female	Male
	(1)	(2)	(3)	(4)	(5)	(6)
ΔMig^{KOR}	0.64	0.36	0.87	1.11	0.63	1.26
	(0.710)	(0.658)	(0.806)	(2.114)	(2.057)	(2.310)
ΔMig^{OTH}	1.15	-0.23	1.98	-3.27	-3.43	-2.89
	(1.678)	(1.600)	(1.802)	(4.301)	(4.125)	(4.656)
$\Delta Native$	0.47***	0.54***	0.43***	0.54***	0.59***	0.50***
	(0.086)	(0.094)	(0.085)	(0.131)	(0.136)	(0.131)
Initial ln(local tax collection)	0.01	-0.01	0.01	0.01	-0.004	0.02
	(0.018)	(0.017)	(0.020)	(0.018)	(0.016)	(0.020)
Initial ln(population density)	-0.02*	-0.00	-0.03***	-0.02*	-0.00	-0.03***
	(0.010)	(0.010)	(0.011)	(0.010)	(0.010)	(0.011)
Initial share of elderly population	0.08	0.28	-0.05	0.25	0.40	0.14
	(0.423)	(0.406)	(0.460)	(0.503)	(0.484)	(0.541)
Initial share of urban population	-0.13	-0.08	-0.14	-0.14	-0.09	-0.15
	(0.086)	(0.075)	(0.099)	(0.087)	(0.075)	(0.100)
Initial share of female workers	0.56***	-0.05	0.78***	0.50***	-0.10	0.70***
	(0.169)	(0.158)	(0.192)	(0.174)	(0.160)	(0.197)
Observations	229	229	229	229	229	229
C.-D. Wald F-statistic				7.357	7.357	7.357
K.-P. rk Wald F-statistic				3.845	3.845	3.845

Notes: The dependent variables are log changes in total employment, log changes in female employment, and log changes in male employment. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

immigrant workers still have no statistically significant effects on local employment across the secondary industries. One interesting finding, however, is that the effects of ethnic Korean and non-Korean immigrants are of opposite signs. While ethnic Korean workers have positive insignificant effects on manufacturing and public utilities employment, they have negative insignificant effects on construction employment. In contrast, non-Korean workers have positive insignificant employment effects on construction but not on manufacturing and public utilities.

These additional analyses have examined the differential impacts of ethnic Korean and non-Korean immigrants on local employment in Korea. Overall, this paper finds that both

Table 19: List of primary, secondary, and tertiary industries

Panel A: Primary Sector
Agriculture
Fishing
Forestry
Mining and quarrying
Panel B: Secondary Sector
Construction
Electricity, gas, steam and air conditioning supply
Manufacturing
Panel C: Tertiary Sector
Accommodation and food service activities
Arts, sports and recreation-related services
Business facilities management and business support services; Rental and leasing activities
Financial and insurance activities
Human health and social work activities
Information and communication
Membership organizations, repair and other personal services
Professional, scientific and technical activities
Public administration and defence; Compulsory social security
Real estate activities
Transportation and storage
Water supply; Sewage, waste management, materials recovery
Wholesale and retail trade

Notes: The table categorizes the industries that appear in the employment data between 2010 and 2019 into primary, secondary, and tertiary sectors.

ethnic Korean and non-Korean immigrants do not seem to have a significant effect on local employment in the long run. It is the ethnic Korean immigration alone that has had a positive effect on primary sector employment. The limitation of these analyses, however, is that the data used in the analyses are at the establishment level. This implies that individuals with two jobs at the same time, for example, may have been double-counted in the dataset, which may lead to inflated results. These results, therefore, would need to be confirmed in future research using alternative datasets such as the household-level survey data.

Table 20: Long-run impact of ethnic Korean and non-Korean immigrants on local employment by sector

	OLS			2SLS		
	Primary (1)	Secondary (2)	Tertiary (3)	Primary (4)	Secondary (5)	Tertiary (6)
ΔMig^{KOR}	18.14***	-4.14	0.81	51.23*	-0.46	-2.38
	(6.470)	(3.305)	(0.577)	(26.588)	(13.295)	(2.409)
ΔMig^{OTH}	7.76	15.34	0.57	-40.31	-4.15	4.05
	(9.945)	(13.760)	(1.420)	(53.829)	(28.817)	(4.894)
$\Delta Native$	-0.21	0.11	0.59***	0.27	0.39	0.55***
	(0.318)	(0.365)	(0.096)	(0.642)	(0.568)	(0.121)
Initial ln(local tax collection)	0.12	-0.06	0.00	0.15	-0.05	0.00
	(0.145)	(0.063)	(0.018)	(0.154)	(0.069)	(0.019)
Initial ln(population density)	-0.12	-0.22***	-0.01	-0.20	-0.22***	-0.00
	(0.103)	(0.067)	(0.009)	(0.134)	(0.077)	(0.009)
Initial share of elderly population	0.26	-4.46**	-0.33	2.15	-3.62	-0.61
	(3.045)	(2.132)	(0.398)	(3.741)	(2.429)	(0.545)
Initial share of urban population	-0.25	0.93	-0.25***	-0.21	0.90	-0.28***
	(0.675)	(0.630)	(0.084)	(0.808)	(0.648)	(0.095)
Initial share of female workers	1.96	1.04	-0.02	2.57*	0.84	-0.09
	(1.285)	(1.272)	(0.166)	(1.449)	(1.228)	(0.170)
Observations	196	229	229	196	229	229
C.-D. Wald F-statistic				6.707	7.357	7.357
K.-P. rk Wald F-statistic				3.879	3.845	3.845

Notes: The dependent variables are log changes in primary sector employment, log changes in secondary sector employment, and log changes in tertiary sector employment. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

6. Discussion: Potential mechanisms

Several explanations may exist regarding the overall negative impacts of immigrants on local cultural facilities in the long run. When the number of local amenities (i.e., social infrastructure, such as schools, in this paper) declines, there could be two potential scenarios. One is that the local population declines, leading to a lower number of consumers. In this case, the municipality may decide to close down the excess facilities to avoid high maintenance costs. If, for example, natives are more likely to avoid immigrant communities, then an immigration inflow may lead to further outflows or reduced inflows of natives into the municipality. If the

Table 21: Long-run impact of ethnic Korean and non-Korean immigrants on secondary sector employment

	OLS			2SLS		
	Manufacturing (1)	Construction (2)	Utility (3)	Manufacturing (4)	Construction (5)	Utility (6)
ΔMig^{KOR}	-7.24	4.91	5.76	1.79	-9.39	28.36
	(4.443)	(3.386)	(7.295)	(14.477)	(15.906)	(23.147)
ΔMig^{OTH}	21.61	15.82	7.42	-9.72	17.95	-11.05
	(17.596)	(15.316)	(6.155)	(33.546)	(29.772)	(38.693)
$\Delta Native$	0.15	-0.10	0.76***	0.59	-0.07	0.94
	(0.419)	(0.359)	(0.223)	(0.707)	(0.539)	(0.594)
Initial ln(local tax collection)	-0.05	-0.06	-0.22***	-0.04	-0.06	-0.21**
	(0.076)	(0.073)	(0.081)	(0.080)	(0.079)	(0.083)
Initial ln(population density)	-0.24***	-0.25***	-0.07	-0.25***	-0.22**	-0.11*
	(0.066)	(0.085)	(0.058)	(0.080)	(0.091)	(0.060)
Initial share of elderly population	-4.59*	-6.31***	-0.51	-3.09	-7.09**	0.92
	(2.651)	(2.170)	(2.512)	(2.628)	(2.779)	(3.358)
Initial share of urban population	1.04	0.89	0.96*	1.02	0.73	1.15*
	(0.650)	(0.757)	(0.584)	(0.684)	(0.757)	(0.644)
Initial share of female workers	0.26	2.94**	-1.35	0.07	2.38*	-0.61
	(1.464)	(1.463)	(1.059)	(1.387)	(1.412)	(1.016)
Observations	229	229	215	229	229	215
C.-D. Wald F-statistic				7.357	7.357	6.953
K.-P. rk Wald F-statistic				3.845	3.845	3.702

Notes: The dependent variables are log changes in manufacturing employment, log changes in construction employment, and log changes in public utility employment. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

size of the native outflow is greater than that of the immigration inflow, the overall decreased local population may lead to the above scenario where the absolute number of local amenities decreases. However, in the native mobility analysis, this paper finds that immigrants tend to attract natives into the municipality. Hence, the above scenario is not likely to be the case in this paper.

Alternatively, despite the immigration-induced population growth, the local amenities may still be negatively affected due to various reasons, such as the local government expenditure. Indeed, Alesina et al. (1999) have demonstrated in the U.S. context that the ethnic diversity of a neighborhood is negatively associated with the local government's spending on productive public goods, such as education and roads, due to the population's polarized pref-

erences. Choi and Lee (2024) further extend this approach by investigating the fiscal impact of ethnic distance between new immigrants and existing residents in the U.S. As in Alesina et al. (1999), the authors find an overall negative relationship, and that the effects vary across spending categories: While the local government spending on public goods directly related to residents' well-being (such as education and welfare) has decreased, the spending on areas related to public order rather increased (Choi and Lee, 2024). These findings from the past literature may thus be able to partially explain the negative effect of immigration on cultural facilities in the long run, since the definition of "cultural facilities" in this paper also includes those running on government budget (e.g., public libraries and museums).

The findings of the above literature, however, cannot fully explain why ethnic Koreans, who are ethnically more homogeneous with native Koreans, show more negative effects on cultural facilities in the Korean context. While the underlying mechanism for such a finding is yet to be empirically identified, it should also be noted that a lot of relevant literature, including the above, is mostly focused on the U.S., and hence it may be difficult to generalize their findings in the Korean context. Moreover, since "cultural facilities" include privately owned sites as well, factors other than public spending may have also played a role. For example, although not directly related to local amenities per se, one aspect to consider would be the elasticity of substitution between immigrants and natives, which is commonly addressed in the immigration literature. While there is ongoing debate on whether immigrants and natives are perfect (Borjas et al., 2012) or imperfect substitutes (Ottaviano and Peri, 2012), one common assumption is that a higher elasticity of substitution between immigrants and natives (e.g., by being in the same skill group) leads to greater downward pressure on native wages. If such is the case, then ethnic Korean immigrant workers (who may have better language skills than non-Korean immigrant workers upon arrival) may be perceived as more immediate substitutes for native Korean workers than do non-Korean immigrant workers, assuming that these three groups of workers have similar educational attainment and work experience. Thus, this could also imply that ethnic Koreans may have a greater negative effect on native wages. Although a separate wage analysis would be needed to confirm the above hypothesis, it may have been indirectly demonstrated through the native mobility analysis, as it is found

that ethnic Koreans have overall negative insignificant effects on the mobility of native Koreans (Table 11). This "negative" reaction of native Koreans towards ethnic Koreans, thus, may be one potential explanation as to why they have more adverse effects on local cultural facilities than non-Korean immigrants.

On the other hand, regarding the elasticity of substitution between non-Korean and native Korean workers, one may expect it to be smaller than the above, given their differences in the average educational attainment. This is also shown in Figure A3, where natives are, in general, more highly educated than immigrants in Korea. Moreover, since non-Korean immigrants may have relatively lower proficiency in the Korean language upon arrival (which indicates limited communication skills), these immigrants and native Koreans, even within the same education group, may be specializing in different tasks within the low-skilled jobs. As highlighted by Ottaviano and Peri (2012), the elasticity of substitution between high-skilled and low-skilled workers tends to be small. Therefore, non-Korean and native Korean workers may be more of complements rather than substitutes. This would not only yield smaller effects on native wages but also may even create positive productivity effects (Ottaviano et al., 2013), which could potentially explain the positive mobility response of natives towards non-Korean immigrants.

Additionally, regarding the finding that native Koreans are attracted to non-Korean immigrants but not to ethnic Korean immigrants, non-economic reasons may have also played a part. In fact, despite their shared ancestry, ethnic Koreans in Korea, especially Korean Chinese, have faced several barriers to assimilation throughout history. First, as described in Section 3, from a legal perspective, Korean Chinese (and those from the CIS region) were initially restricted from the F-4 visa program before 2008, when such restrictions did not apply to ethnic Koreans from other countries like the U.S. or Japan. To compensate these immigrants, the Exceptionally Permissible Employment Permit System was introduced in 2002, but this system also had several restrictions upon implementation, such as on age (only those over 40 years old could apply) and the type of jobs individuals could hold (service industry) (Youn and Jin, 2011). Moreover, from a sociological perspective, several studies have pointed out that Korean Chinese are often perceived by native Koreans more as 'foreigners' than as

fellow Koreans and that their portrayal in the media tends to be negative (Seo, 2014; Kim, 2018). Among the various factors contributing to ongoing tensions between native and ethnic Koreans, one possible reason could be the 'dual identities' of ethnic Koreans, which contrast with Korea's long history of being an ethnically homogeneous country (Kim, 2014). The potential mechanisms behind the non-positive mobility response of native Koreans towards ethnic Koreans, therefore, may include reasons like the above.

7. Conclusion

This paper has explored the amenity effects of immigration in South Korean municipalities using the data from 2010 to 2019. This paper attempted to build a causal relationship between the variables of interest by constructing shift-share instruments based on the ethnic enclaves of immigrants. The findings suggest that while immigration does not affect local amenities by much in the short run, immigration has negative effects on cultural facilities in the long run, which seem to be mostly driven by the inflow of ethnic Koreans. Non-Korean immigrants, on the other hand, have had no significant effects on amenities in the long run. This paper also finds that native Koreans tend to be attracted to municipalities that experience an inflow of non-Korean immigrants, but no such response has been observed for the inflow of ethnic Korean immigrants. These findings have remained robust even after excluding Chinese immigrants from the key explanatory variables.

It is interesting to observe that the effects of non-Korean immigrants are mostly concentrated on the densities of daycare facilities and elementary schools, while those of ethnic Korean immigrants are concentrated on private tutoring facilities and cultural facilities. This could be coming from the difference in the compositions of ethnic Koreans, non-Koreans, and native Koreans who respond to immigration shocks (e.g., birth rate, education and income level, marital and parental status, preferences, etc.). For example, the negative effect of ethnic Korean immigrants on the local number of private tutoring facilities may be due to the declining birth rate of these immigrants. Indeed, Statistics Korea (2024b) has recently announced that the total fertility rate of female immigrants in Korea had been 0.69 as of 2023,

which is even lower than that of female natives of 0.73. Due to the limited data availability on immigrant demographics, however, it is difficult to confirm at the moment which one is the main determinant of such a difference in results. Also, while this paper finds that native Koreans tend to respond positively toward the inflows of non-Korean immigrants but not to those of ethnic Korean immigrants, these findings still cannot fully explain why the inflow of ethnic Korean immigrants leads to a lower number of local cultural facilities. Identifying the potential channels behind these results would, therefore, be left to future research.

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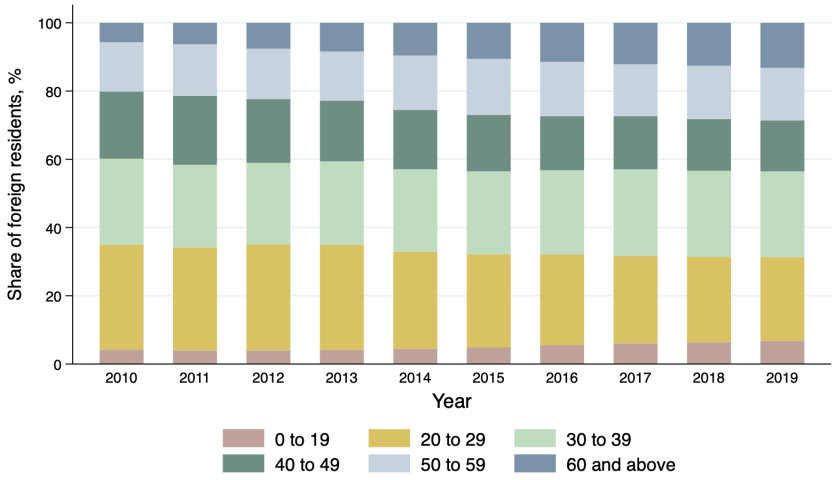
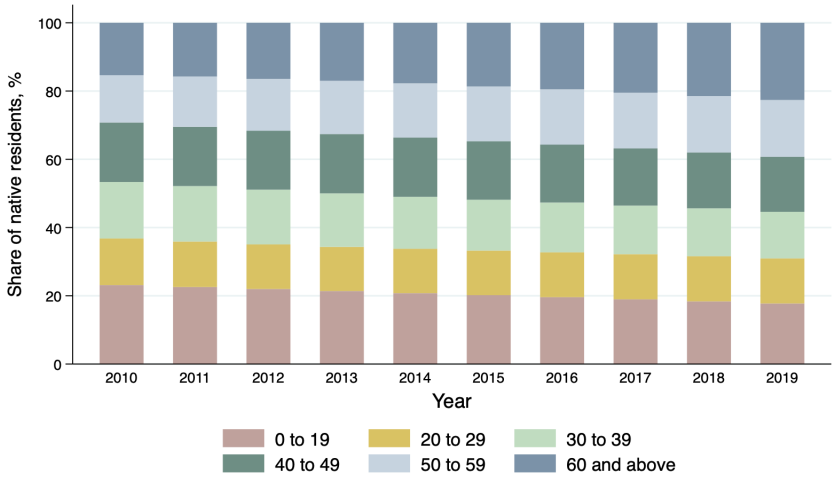
Appendix

Figure A1: Age demographics

Panel A: Foreign residents



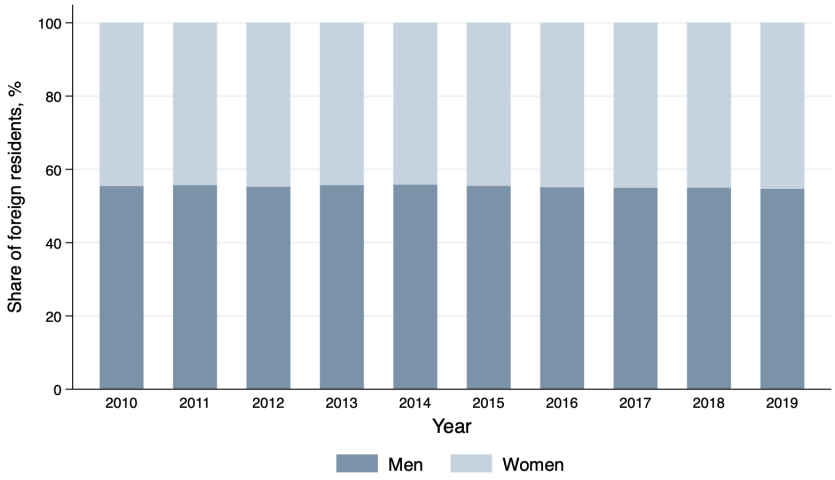
Panel B: Native residents



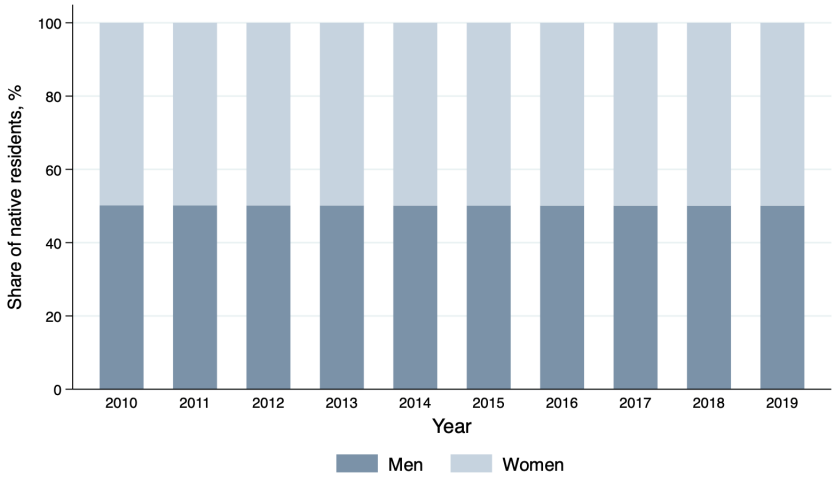
Notes: Panel A shows the share of long-term foreign residents (including ethnic Koreans from all origin countries) by age group. Panel B shows the share of native residents by age group. Native residents refer to native Koreans residing in South Korea (excluding those residing abroad). The data are from the Statistics of Registered Foreigners and the Status of Overseas Koreans' Report of Domestic Residence of the Ministry of Justice (Panel A) and the Resident Registration Demographics of the Ministry of the Interior and Safety (Panel B).

Figure A2: Gender demographics

Panel A: Foreign residents

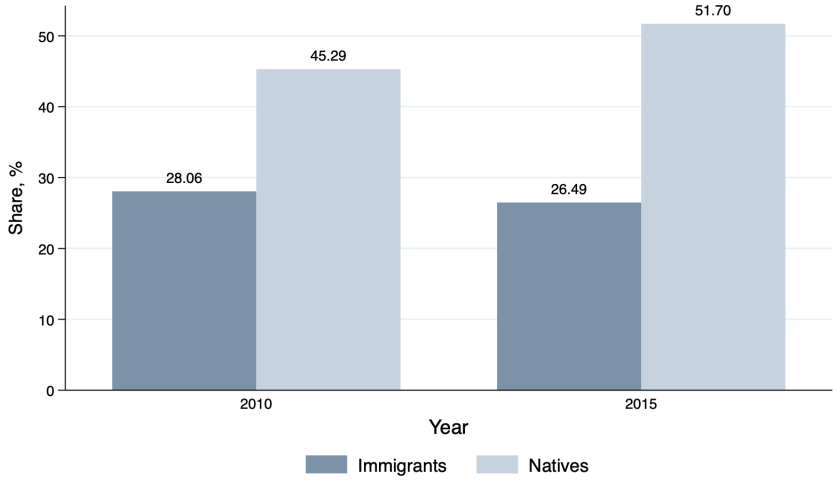


Panel B: Native residents



Notes: Panel A shows the share of long-term foreign residents (including ethnic Koreans from all origin countries) by gender. Panel B shows the share of native residents by gender. Native residents refer to native Koreans residing in South Korea (excluding those residing abroad). The data are from the Statistics of Registered Foreigners and the Status of Overseas Koreans' Report of Domestic Residence of the Ministry of Justice (Panel A) and the Resident Registration Demographics of the Ministry of the Interior and Safety (Panel B).

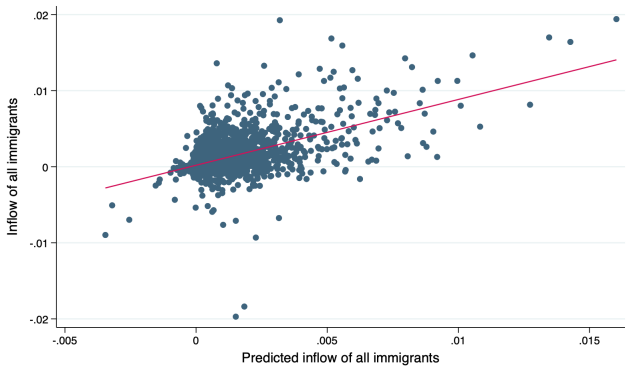
Figure A3: Educational attainment



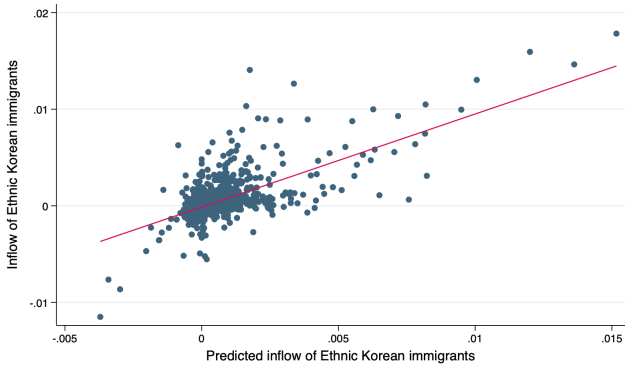
Notes: The figure shows the share of long-term foreign residents and native residents aged 25-64 with some college education and above. Native residents refer to native Koreans residing in South Korea (excluding those residing abroad). The data are from the Population and Housing Census.

Figure A4: First-stage fits (short-run)

Panel A: Total immigrants



Panel B: Ethnic-Koreans



Panel C: Non-Koreans

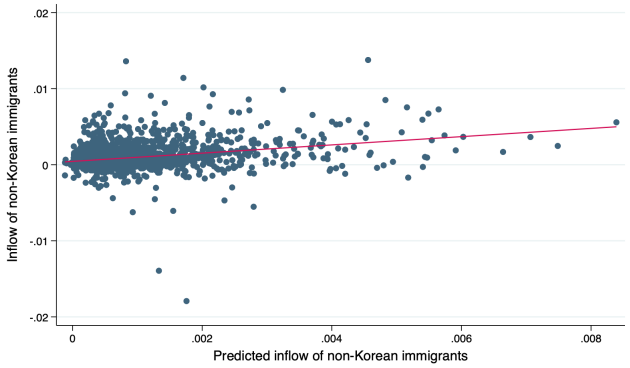
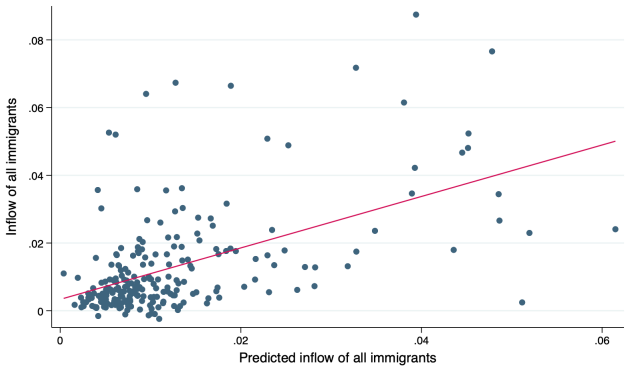
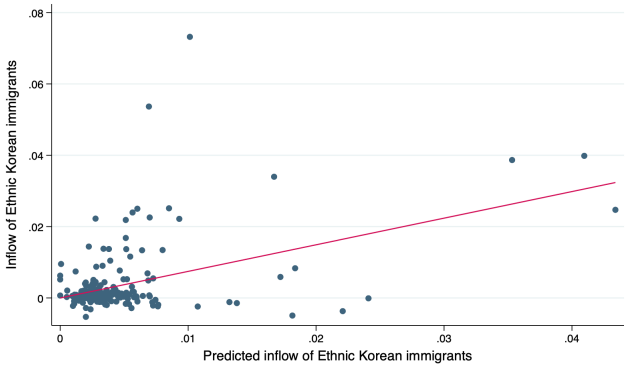


Figure A5: First-stage fits (long-run)

Panel A: Total immigrants



Panel B: Ethnic-Koreans



Panel C: Non-Koreans

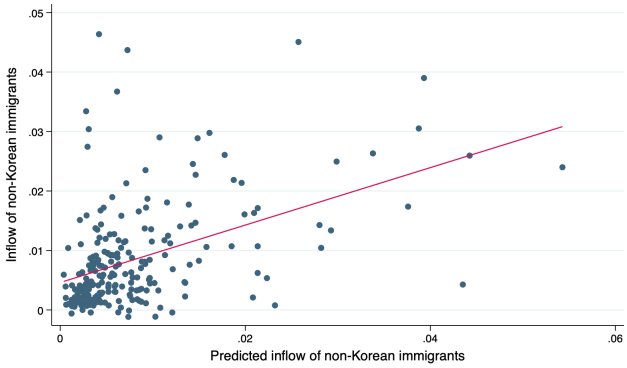
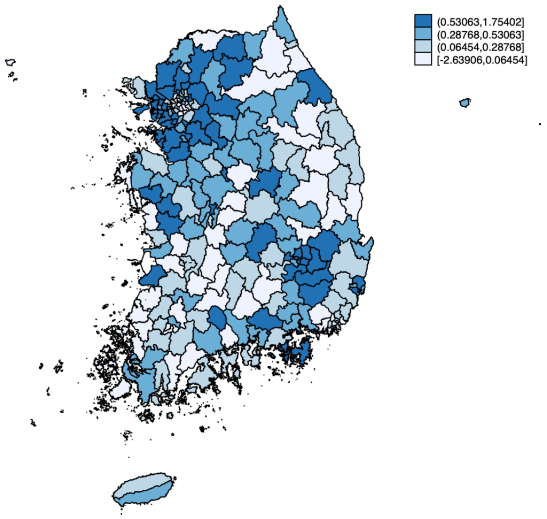
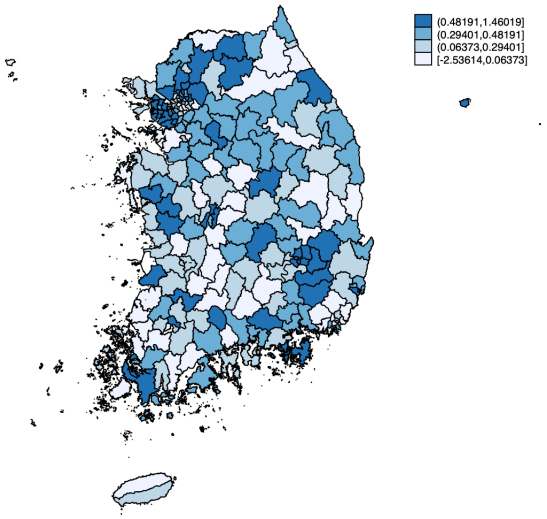


Figure A6: Geographical allocation of changes in social welfare facilities

Panel A: $\Delta \ln$(social welfare facilities)



Panel B: $\Delta \ln$(social welfare facilities per person)



Notes: Panel A (Panel B) illustrates the sum of yearly log changes in the number of social welfare facilities (per person) between 2010 and 2019. The data are from the Ministry of the Interior and Safety.

Table A1: List of origin (ethnic) groups

$\Delta\widehat{Mig}$	$\Delta\widehat{Mig^{KOR}}$	$\Delta\widehat{Mig^{OTH}}$
Korean Chinese	Korean Chinese	China
China		Taiwan
Taiwan		Japan
Japan		Mongolia
Mongolia		United States
United States		Russian Federation
Russian Federation		Southeast Asia
Southeast Asia		South Asia
South Asia		Central Asia
Central Asia		Rest of the World
Rest of the World		

Table A2: Additional summary statistics

	Obs.	Mean	St. Dev.	Min	Max
Panel A: Total Number of Amenities					
$\Delta\ln$(daycare facilities)	2,061	-0.001	0.066	-0.693	0.459
$\Delta\ln$(elementary schools)	2,061	0.002	0.025	-0.223	0.297
$\Delta\ln$(senior centers)	2,061	0.011	0.111	-1.360	1.384
$\Delta\ln$(private tutoring facilities)	2,059	-0.003	0.181	-2.457	2.383
$\Delta\ln$(social welfare facilities)	2,061	0.034	0.172	-2.639	1.872
$\Delta\ln$(cultural facilities)	2,061	0.048	0.107	-0.470	1.099
$\Delta\ln$(waste emission)	2,061	0.019	0.204	-1.796	2.281
Panel B: Native Mobility					
Native in-migration	229	0.130	0.074	0.063	0.996
Native out-migration	229	0.130	0.050	0.070	0.709
Native net-migration	229	0.000	0.029	-0.037	0.287

Table A3: Short-run impact of immigrants on local amenities per person (OLS)

Panel A: Total Immigrants								
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig	-0.94**	-1.51***	-3.54***	-1.23	-2.08	-0.59	-1.21	0.45
	(0.424)	(0.338)	(1.288)	(1.481)	(1.676)	(1.168)	(2.217)	(0.911)
$\Delta Native$	0.01	-0.46***	-0.17	-0.79***	-0.60***	-0.95***	-0.62	0.02
	(0.087)	(0.058)	(0.271)	(0.191)	(0.214)	(0.182)	(0.490)	(0.107)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061	2,022
R-squared	0.539	0.170	0.006	0.023	0.027	0.058	0.037	0.266
Panel B: Ethnic Koreans and Non-Koreans								
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig^{KOR}	-1.19**	-1.63***	-5.71**	1.35	-2.85	-0.53	-1.19	-0.03
	(0.576)	(0.497)	(2.687)	(1.110)	(2.321)	(1.550)	(3.214)	(1.202)
ΔMig^{OTH}	-0.70	-1.56***	-0.59	-4.75*	-0.22	-1.34	-2.02	1.18
	(0.712)	(0.336)	(2.404)	(2.505)	(3.014)	(1.941)	(2.796)	(1.139)
$\Delta Native$	0.00	-0.46***	-0.19	-0.77***	-0.62***	-0.94***	-0.62	0.02
	(0.087)	(0.058)	(0.274)	(0.190)	(0.212)	(0.183)	(0.493)	(0.106)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061	2,022
R-squared	0.539	0.173	0.007	0.024	0.027	0.058	0.037	0.266

Notes: This table focuses on the number of amenities per person, except for column (8). All regressions include controls, municipality fixed effect, and year fixed effect. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

Table A4: Short-run impact of immigrants on the total number of local amenities (OLS)

Panel A: Total Immigrants							
	$\Delta\ln$(daycare facilities)	$\Delta\ln$(elementary schools)	$\Delta\ln$(senior centers)	$\Delta\ln$(private tutoring facilities)	$\Delta\ln$(welfare facilities)	$\Delta\ln$(cultural facilities)	$\Delta\ln$(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig	0.04	-0.52	-2.56**	-0.25	-1.09	0.39	-0.23
	(0.423)	(0.340)	(1.293)	(1.482)	(1.674)	(1.163)	(2.217)
$\Delta Native$	0.95***	0.48***	0.78***	0.16	0.34	-0.01	0.32
	(0.094)	(0.055)	(0.267)	(0.186)	(0.216)	(0.175)	(0.505)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061
R-squared	0.595	0.158	0.010	0.014	0.026	0.042	0.032
Panel B: Ethnic Koreans and Non-Koreans							
	$\Delta\ln$(daycare facilities)	$\Delta\ln$(elementary schools)	$\Delta\ln$(senior centers)	$\Delta\ln$(private tutoring facilities)	$\Delta\ln$(welfare facilities)	$\Delta\ln$(cultural facilities)	$\Delta\ln$(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig^{KOR}	-0.20	-0.64	-4.72*	2.34**	-1.86	0.46	-0.20
	(0.578)	(0.497)	(2.691)	(1.111)	(2.324)	(1.550)	(3.214)
ΔMig^{OTH}	0.32	-0.54	0.42	-3.74	0.80	-0.33	-1.00
	(0.710)	(0.346)	(2.401)	(2.509)	(3.009)	(1.935)	(2.790)
$\Delta Native$	0.95***	0.48***	0.75***	0.18	0.32	-0.001	0.32
	(0.094)	(0.055)	(0.270)	(0.185)	(0.213)	(0.176)	(0.509)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061
R-squared	0.595	0.159	0.012	0.016	0.026	0.042	0.032

Notes: This table focuses on the absolute number of amenities. All regressions include controls, municipality fixed effect, and year fixed effect. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

Table A5: Long-run impact of immigrants on local amenities per person (OLS)

	Panel A: Total Immigrants							
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig	-1.92**	-1.01***	-0.68**	-2.69***	1.39	-3.22**	1.72	0.29
	(0.958)	(0.368)	(0.317)	(0.640)	(1.705)	(1.240)	(1.554)	(0.400)
$\Delta Native$	0.20***	-0.25***	-0.62***	0.27***	-0.51***	-0.19*	-0.07	-0.00
	(0.063)	(0.092)	(0.025)	(0.082)	(0.105)	(0.108)	(0.127)	(0.022)
Observations	229	229	229	229	229	229	229	224
R-squared	0.213	0.644	0.837	0.182	0.121	0.254	0.085	0.432
	Panel B: Ethnic Koreans and Non-Koreans							
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig^{KOR}	-1.62	-0.57	-0.58	-3.67***	2.36	-4.84***	-0.58	-0.00
	(1.236)	(0.536)	(0.594)	(0.946)	(2.092)	(1.736)	(1.781)	(0.630)
ΔMig^{OTH}	-2.61	-2.08***	-1.01*	-1.82	-0.95	-1.89	6.13*	0.95
	(1.822)	(0.698)	(0.546)	(1.352)	(4.751)	(2.230)	(3.280)	(0.708)
$\Delta Native$	0.21***	-0.24***	-0.61***	0.26***	-0.48***	-0.21*	-0.13	-0.01
	(0.067)	(0.092)	(0.026)	(0.083)	(0.107)	(0.112)	(0.139)	(0.022)
Observations	229	229	229	229	229	229	229	224
R-squared	0.211	0.651	0.837	0.187	0.122	0.263	0.096	0.435

Notes: This table focuses on the number of amenities per person, except for column (8). All regressions include controls. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

Table A6: Long-run impact of immigrants on the total number of local amenities (OLS)

Panel A: Total Immigrants							
	Δln(daycare facilities)	Δln(elementary schools)	Δln(senior centers)	Δln(private tutoring facilities)	Δln(welfare facilities)	Δln(cultural facilities)	Δln(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig	-0.79	0.13	0.46	-1.55**	2.53	-2.08*	2.86*
	(1.095)	(0.391)	(0.401)	(0.617)	(1.698)	(1.148)	(1.531)
$\Delta Native$	0.83***	0.37***	0.01	0.90***	0.11	0.44***	0.55***
	(0.126)	(0.025)	(0.108)	(0.167)	(0.117)	(0.094)	(0.088)
Observations	229	229	229	229	229	229	229
R-squared	0.493	0.718	0.054	0.463	0.159	0.165	0.306
Panel B: Ethnic Koreans and Non-Koreans							
	Δln(daycare facilities)	Δln(elementary schools)	Δln(senior centers)	Δln(private tutoring facilities)	Δln(welfare facilities)	Δln(cultural facilities)	Δln(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig^{KOR}	-0.52	0.52	0.52	-2.57***	3.46*	-3.74**	0.52
	(1.342)	(0.594)	(0.697)	(0.938)	(2.033)	(1.720)	(1.756)
ΔMig^{OTH}	-1.15	-0.62	0.46	-0.36	0.51	-0.42	7.59**
	(1.949)	(0.754)	(0.762)	(1.487)	(4.874)	(2.222)	(3.250)
$\Delta Native$	0.83***	0.38***	0.01	0.88***	0.15	0.42***	0.50***
	(0.130)	(0.024)	(0.111)	(0.169)	(0.124)	(0.094)	(0.096)
Observations	229	229	229	229	229	229	229
R-squared	0.493	0.721	0.054	0.466	0.158	0.174	0.315

Notes: This table focuses on the absolute number of amenities. All regressions include controls. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

Table A7: Long-run impact of total immigrants on native mobility (OLS)

	Native In-migration		Native Out-migration		Native Net-migration	
	(1)	(2)	(3)	(4)	(5)	(6)
ΔMig	0.40*	0.36*	0.16	0.12	0.24*	0.24*
	(0.228)	(0.218)	(0.148)	(0.130)	(0.130)	(0.139)
Initial ln(local tax collection)	0.00	0.01	0.00	0.00	0.00	0.00
	(0.005)	(0.006)	(0.003)	(0.003)	(0.003)	(0.003)
Initial ln(population density)	-0.00	-0.00	0.00	-0.00	-0.00	-0.00*
	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)
Initial share of elderly population	-0.13	0.03	-0.15**	-0.03	0.03	0.06
	(0.107)	(0.140)	(0.068)	(0.092)	(0.054)	(0.078)
Initial share of urban population	0.06**	0.06	0.03*	0.03	0.03*	0.03
	(0.028)	(0.042)	(0.018)	(0.027)	(0.014)	(0.024)
Initial share of female workers	-0.10*	-0.09	-0.04	-0.04	-0.05*	-0.05
	(0.058)	(0.068)	(0.035)	(0.041)	(0.031)	(0.037)
Δln(employment)	0.20***	0.15***	0.12***	0.08***	0.08***	0.07***
	(0.059)	(0.034)	(0.040)	(0.019)	(0.021)	(0.019)
Initial ln(apartment price index)		0.02		0.00		0.02*
		(0.015)		(0.010)		(0.011)
Observations	229	122	229	122	229	122
R-squared	0.417	0.437	0.386	0.339	0.379	0.398

Notes: The dependent variables are the number of natives who moved in, the number of natives who moved out, and the net number of natives who moved in, each relative to the initial population. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

Table A8: Long-run impact of ethnic Korean and non-Korean immigrants on native mobility (OLS)

	Native In-migration		Native Out-migration		Native Net-migration	
	(1)	(2)	(3)	(4)	(5)	(6)
ΔMig^{KOR}	-0.22	-0.17	-0.28*	-0.23	0.06	0.06
	(0.303)	(0.324)	(0.144)	(0.149)	(0.232)	(0.247)
ΔMig^{OTH}	1.58***	1.57***	0.98***	0.89***	0.60**	0.69**
	(0.556)	(0.527)	(0.351)	(0.270)	(0.263)	(0.322)
Initial ln(local tax collection)	0.00	0.01	0.00	0.00	0.00	0.00
	(0.005)	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)
Initial ln(population density)	-0.00	-0.00	0.00	-0.00	-0.00	-0.00
	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)
Initial share of elderly population	-0.19*	-0.13	-0.19***	-0.13	0.01	-0.00
	(0.108)	(0.150)	(0.069)	(0.096)	(0.056)	(0.087)
Initial share of urban population	0.05*	0.06	0.03	0.04	0.02	0.03
	(0.028)	(0.042)	(0.018)	(0.028)	(0.015)	(0.024)
Initial share of female workers	-0.09*	-0.08	-0.04	-0.03	-0.05*	-0.05
	(0.054)	(0.062)	(0.033)	(0.037)	(0.030)	(0.035)
Δln(employment)	0.19***	0.14***	0.11***	0.08***	0.07***	0.07***
	(0.054)	(0.031)	(0.037)	(0.018)	(0.020)	(0.018)
Initial ln(apartment price index)		0.02		0.00		0.02*
		(0.016)		(0.011)		(0.011)
Observations	229	122	229	122	229	122
R-squared	0.445	0.473	0.420	0.386	0.391	0.414

Notes: The dependent variables are the number of natives who moved in, the number of natives who moved out, and the net number of natives who moved in, each relative to the initial population. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

Table A9: Short-run impact of immigrants (excl. Chinese) on local amenities per person (OLS)

	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Total Immigrants (excl. Chinese)								
$\Delta Mig - 1.13 * **$	-1.52***	-4.05***	-1.21	-1.96	-0.32	-0.60	0.28	
	(0.429)	(0.332)	(1.462)	(1.535)	(1.762)	(1.192)	(2.336)	(0.906)
$\Delta Native$	0.01	-0.46***	-0.16	-0.79***	-0.61***	-0.95***	-0.63	0.02
	(0.087)	(0.057)	(0.270)	(0.191)	(0.214)	(0.182)	(0.490)	(0.107)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061	2,022
R-squared	0.539	0.169	0.006	0.023	0.027	0.058	0.037	0.265
Panel B: Ethnic Koreans and Non-Koreans (excl. Chinese)								
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig^{KOR}	-1.18**	-1.64***	-5.69**	1.33	-2.87	-0.56	-1.25	-0.01
	(0.573)	(0.498)	(2.674)	(1.107)	(2.325)	(1.553)	(3.203)	(1.207)
ΔMig^{OTH}	-1.24*	-1.56***	-1.57	-5.31*	0.55	-0.61	-0.21	0.77
	(0.725)	(0.338)	(2.714)	(2.757)	(3.614)	(2.124)	(3.111)	(1.190)
$\Delta Native$	0.01	-0.46***	-0.18	-0.77***	-0.62***	-0.95***	-0.63	0.02
	(0.087)	(0.057)	(0.275)	(0.189)	(0.211)	(0.183)	(0.493)	(0.106)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061	2,022
R-squared	0.539	0.171	0.007	0.025	0.027	0.058	0.037	0.266

Notes: This table focuses on the number of amenities per person, except for column (8). All regressions include controls, municipality fixed effect, and year fixed effect. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

Table A10: Short-run impact of immigrants (excl. Chinese) on the total number of local amenities (OLS)

Panel A: Total Immigrants (excl. Chinese)							
	Δln(daycare facilities)	Δln(elementary schools)	Δln(senior centers)	Δln(private tutoring facilities)	Δln(welfare facilities)	Δln(cultural facilities)	Δln(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig	-0.13	-0.51	-3.05**	-0.21	-0.96	0.69	0.41
	(0.429)	(0.333)	(1.464)	(1.535)	(1.760)	(1.185)	(2.338)
$\Delta Native$	0.95***	0.48***	0.78***	0.16	0.34	-0.01	0.31
	(0.094)	(0.055)	(0.267)	(0.186)	(0.216)	(0.175)	(0.506)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061
R-squared	0.595	0.158	0.011	0.014	0.026	0.042	0.032
Panel B: Ethnic Koreans and Non-Koreans (excl. Chinese)							
	Δln(daycare facilities)	Δln(elementary schools)	Δln(senior centers)	Δln(private tutoring facilities)	Δln(welfare facilities)	Δln(cultural facilities)	Δln(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig^{KOR}	-0.19	-0.65	-4.69*	2.32**	-1.87	0.44	-0.26
	(0.575)	(0.498)	(2.673)	(1.109)	(2.327)	(1.550)	(3.205)
ΔMig^{OTH}	-0.17	-0.50	-0.51	-4.25	1.62	0.45	0.85
	(0.728)	(0.341)	(2.712)	(2.762)	(3.612)	(2.119)	(3.108)
$\Delta Native$	0.95***	0.48***	0.76***	0.18	0.32	-0.01	0.31
	(0.094)	(0.054)	(0.271)	(0.184)	(0.213)	(0.176)	(0.508)
Observations	2,061	2,061	2,061	2,059	2,061	2,061	2,061
R-squared	0.595	0.158	0.012	0.016	0.026	0.042	0.032

Notes: This table focuses on the absolute number of amenities. All regressions include controls, municipality fixed effect, and year fixed effect. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

Table A11: Long-run impact of immigrants (excl. Chinese) on local amenities per person (OLS)

Panel A: Total Immigrants (excl. Chinese)								
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig	-2.16**	-1.03**	-0.79**	-2.74***	2.15	-3.11**	1.75	0.28
	(1.076)	(0.401)	(0.345)	(0.704)	(1.891)	(1.320)	(1.730)	(0.442)
$\Delta Native$	0.20***	-0.26***	-0.62***	0.26***	-0.52***	-0.20*	-0.07	-0.00
	(0.062)	(0.092)	(0.025)	(0.082)	(0.104)	(0.106)	(0.126)	(0.022)
Observations	229	229	229	229	229	229	229	224
R-squared	0.213	0.641	0.837	0.176	0.124	0.246	0.084	0.431
Panel B: Ethnic Koreans and Non-Koreans (excl. Chinese)								
	Δln(daycare facilities per person)	Δln(elementary schools per person)	Δln(senior centers per person)	Δln(private tutoring facilities per person)	Δln(welfare facilities per person)	Δln(cultural facilities per person)	Δln(waste emission per person)	Δln(traffic culture index)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔMig^{KOR}	-1.91	-0.84	-0.68	-3.95***	2.07	-5.18***	0.17	0.11
	(1.231)	(0.536)	(0.570)	(0.941)	(1.927)	(1.741)	(1.802)	(0.609)
ΔMig^{OTH}	-3.17	-1.97**	-1.37**	-0.93	1.95	0.01	6.31	0.94
	(2.246)	(0.853)	(0.609)	(1.587)	(5.488)	(2.310)	(3.875)	(0.840)
$\Delta Native$	0.21***	-0.25***	-0.61***	0.24***	-0.51***	-0.23**	-0.11	-0.01
	(0.065)	(0.092)	(0.025)	(0.080)	(0.105)	(0.111)	(0.138)	(0.022)
Observations	229	229	229	229	229	229	229	224
R-squared	0.212	0.644	0.838	0.184	0.123	0.261	0.093	0.433

Notes: This table focuses on the number of amenities per person, except for column (8). All regressions include controls. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

Table A12: Long-run impact of immigrants (excl. Chinese) on the total number of local amenities (OLS)

Panel A: Total Immigrants (excl. Chinese)							
	$\Delta\ln$(daycare facilities)	$\Delta\ln$(elementary schools)	$\Delta\ln$(senior centers)	$\Delta\ln$(private tutoring facilities)	$\Delta\ln$(welfare facilities)	$\Delta\ln$(cultural facilities)	$\Delta\ln$(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig	2.96*	-0.95	0.19	0.43	-1.52**	3.37*	-1.90
	(1.238)	(0.437)	(0.442)	(0.680)	(1.896)	(1.209)	(1.693)
$\Delta Native$	0.83***	0.37***	0.01	0.89***	0.11	0.43***	0.56***
	(0.126)	(0.025)	(0.108)	(0.167)	(0.114)	(0.092)	(0.088)
Observations	229	229	229	229	229	229	229
R-squared	0.494	0.718	0.052	0.462	0.164	0.159	0.304
Panel B: Ethnic Koreans and Non-Koreans (excl. Chinese)							
	$\Delta\ln$(daycare facilities)	$\Delta\ln$(elementary schools)	$\Delta\ln$(senior centers)	$\Delta\ln$(private tutoring facilities)	$\Delta\ln$(welfare facilities)	$\Delta\ln$(cultural facilities)	$\Delta\ln$(waste emission)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔMig^{KOR}	-0.63	0.44	0.60	-2.67***	3.35*	-3.90**	1.45
	(1.346)	(0.576)	(0.675)	(0.922)	(1.861)	(1.695)	(1.782)
ΔMig^{OTH}	-1.68	-0.47	0.12	0.56	3.45	1.50	7.80**
	(2.451)	(0.941)	(0.916)	(1.777)	(5.677)	(2.290)	(3.804)
$\Delta Native$	0.83***	0.38***	0.02	0.87***	0.11	0.39***	0.52***
	(0.130)	(0.023)	(0.111)	(0.167)	(0.116)	(0.089)	(0.095)
Observations	229	229	229	229	229	229	229
R-squared	0.493	0.720	0.053	0.466	0.161	0.175	0.311

Notes: This table focuses on the absolute number of amenities. All regressions include controls. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

Table A13: Long-run impact of total immigrants (excl. Chinese) on native mobility (OLS)

	Native In-migration		Native Out-migration		Native Net-migration	
	(1)	(2)	(3)	(4)	(5)	(6)
ΔMig	0.36	0.36	0.11	0.10	0.25	0.26
	(0.241)	(0.246)	(0.148)	(0.140)	(0.149)	(0.161)
Initial ln(local tax collection)	0.00	0.01	0.00	0.00	0.00	0.00
	(0.005)	(0.006)	(0.003)	(0.003)	(0.003)	(0.003)
Initial ln(population density)	-0.00	-0.00	0.00	-0.00	-0.00	-0.00*
	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)
Initial share of elderly population	-0.12	0.04	-0.15**	-0.03	0.03	0.06
	(0.106)	(0.141)	(0.068)	(0.092)	(0.054)	(0.078)
Initial share of urban population	0.06**	0.06	0.03*	0.03	0.03*	0.03
	(0.028)	(0.043)	(0.018)	(0.028)	(0.014)	(0.025)
Initial share of female workers	-0.10*	-0.09	-0.05	-0.04	-0.05*	-0.05
	(0.059)	(0.068)	(0.036)	(0.040)	(0.032)	(0.037)
Δln(employment)	0.20***	0.15***	0.12***	0.08***	0.08***	0.07***
	(0.060)	(0.035)	(0.040)	(0.019)	(0.022)	(0.019)
Initial ln(apartment price index)		0.02		0.00		0.02*
		(0.015)		(0.010)		(0.011)
Observations	229	122	229	122	229	122
R-squared	0.413	0.433	0.384	0.336	0.376	0.397

Notes: The dependent variables are the number of natives who moved in, the number of natives who moved out, and the net number of natives who moved in, each relative to the initial population. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.

Table A14: Long-run impact of ethnic Korean and non-Korean immigrants (excl. Chinese) on native mobility (OLS)

	Native In-migration		Native Out-migration		Native Net-migration	
	(1)	(2)	(3)	(4)	(5)	(6)
ΔMig^{KOR}	-0.01	0.03	-0.15	-0.11	0.14	0.14
	(0.279)	(0.301)	(0.136)	(0.146)	(0.219)	(0.231)
ΔMig^{OTH}	1.46**	1.62**	0.84**	0.85**	0.62**	0.77*
	(0.592)	(0.694)	(0.362)	(0.352)	(0.300)	(0.411)
Initial ln(local tax collection)	0.00	0.01	0.00	0.00	0.00	0.00
	(0.005)	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)
Initial ln(population density)	0.00	-0.00	0.00	-0.00	-0.00	-0.00
	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)
Initial share of elderly population	-0.14	-0.07	-0.16**	-0.09	0.02	0.02
	(0.105)	(0.147)	(0.067)	(0.095)	(0.054)	(0.084)
Initial share of urban population	0.06**	0.07	0.03*	0.04	0.03*	0.03
	(0.028)	(0.043)	(0.018)	(0.029)	(0.014)	(0.024)
Initial share of female workers	-0.10*	-0.08	-0.04	-0.04	-0.05*	-0.05
	(0.055)	(0.062)	(0.034)	(0.038)	(0.030)	(0.034)
Δln(employment)	0.19***	0.14***	0.11***	0.08***	0.07***	0.07***
	(0.057)	(0.032)	(0.038)	(0.018)	(0.021)	(0.018)
Initial ln(apartment price index)		0.02		0.00		0.02*
		(0.016)		(0.011)		(0.011)
Observations	229	122	229	122	229	122
R-squared	0.430	0.461	0.403	0.368	0.384	0.411

Notes: The dependent variables are the number of natives who moved in, the number of natives who moved out, and the net number of natives who moved in, each relative to the initial population. All regressions are weighted by initial populations. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by municipality.