One Bed, Two Dreams: Female Migration, Conservative Norms and Foreign Brides in South Korea

Giulia Briselli*

February 28, 2024

Abstract

Migration affects a country's social and demographic outcomes, such as marriage and fertility. However, the effects of internal migration on family formation are still not well understood. In this paper I empirically show that the "import" of brides from less developed countries is the response of men to a marriage squeeze brought by female internal migration. I use the setting of South Korea to analyze how female internal mobility affects the demand for marriages between local men and immigrant brides and I investigate the implications for fertility rates. To obtain causal identification, I use a two-way fixed effect model and an enclave instrument based on past internal migration. Results show that higher out-migration of local women affects international migration by raising men's demand for foreign brides. I find a negative effect of female out-migration on fertility, which is partially offset by the increase in international marriages. Further, I demonstrate that men's conservatism in gender attitudes reinforces the effect of local female flight on the demand for immigrant brides.

Keywords: Marriage Market, Internal Migration, International Marriages, Demographic Trends, Gender.

JEL Codes: J12, J13, R23.

*gbriselli@escp.eu. I am thankful to Alexia Delfino, Elena Esposito and Tommaso Frattini, for their comments and suggestions. I am especially grateful to Ainoa Aparicio Fenoll and Juan S. Morales for advice and support. I owe special thanks to Libertad Gonzalez and to Ruben Durante. I am grateful to Sonia Bhalotra, Alberto Bisin, Zelda Brutti, Daniela Del Boca, Christopher Flynn, Albrecht Glitz, Brett A. McCully, Giovanni Peri, Giacomo Ponzetto, Hillel Rapoport, Estefania Santacreu-Vasut as well as all the participants at CCA, Unito and Upf internal seminar, Wilfrid Laurier University Seminar, 6th Meeting of the Society of Economics of the Household, 35th Annual Conference of the European Society for Population Economics, Workshop on Gender Inequality in Labor Markets (IAAEU), Rare Voices in Economics" Conference - Women in Econ Leman (University of Geneva), Summer School Workshop in Migration Economics (PSE) for helpful comments. All errors are my own.

1 Introduction

Rural to urban migration is a fundamental feature of economic development. Historically, industrialization has led to urbanization, increasing the geographic polarization of the economic opportunities within a country (Lagakos, 2020). Migration also affects the demographic composition both at origin and at destination, and depending on the characteristics of movers, it determines the evolution of trends related to education, income and ethnicity (Alesina et al., 2016; Docquier at al., 2012; McKenzie et al., 2011). However the implications of economic-driven internal migration for a country's demographics, such as marriage and fertility rates, are still not well understood.

Most of the literature on migration focuses on the effects on labor market outcomes and productivity (Card, 2001; Borjas, 2003; Borjas and Katz, 2007; Ottaviano and Peri, 2012) and the same is true also for studies focusing on internal rather than international migration (Boustan et al. 2010, Bryan et al. 2019, Morales 2018). Internal migration may have implications on a country's demographics through its effects on the local marriage market. Depending on the characteristics of movers, demographic outcomes such as gender imbalances, the dependency ratio (i.e. the fraction of young individuals over older ones) and fertility rates, can be affected both at origin and at destination. While the implications of migration for the labor market or for political outcomes have extensively been studied, the effects of migration on outcomes related to family formation have received less attention (Carlana and Tabellini, 2018; Daudin et al. 2019).

This paper studies how internal migration affects family formation. In particular, I investigate how female internal migration affects the marriage market through the demand for international marriages, looking at the implications for fertility outcomes. I show a way in which men cope with the scarcity of marriageable women, by importing brides from less developed countries, hence increasing international migration. I study this question in the context of South Korea (hereafter, Korea). Korea serves as an appropriate case study for two main reasons. First, Korea went through recent and fast economic growth and development, providing an excellent example of internal migration driven by urbanization. Second, marriages between local men and foreign women have become a popular channel of family formation, which accounted for almost 10 percent of total new marriages in 2005 (Korean Statistics Office).

The main contribution of this paper is to provide the first causal evidence of the effect of gendered internal migration on both international marriages and fertility outcomes. To do so, I exploit a wide range of administrative data and survey data on South Korea. Administrative data provide district-level information on internal migration by gender and

age, marriages by type, population and fertility rates. Survey data shed light on the cultural aspects of marriage and family formation, in particular on the evolution of attitudes towards family and gender norms over generations, highlighting an increasing divergence between more recent generations of women and men[1]. For the empirical estimation, I exploit the panel of district-level data over the years 2005-2019, by regressing the fraction of international marriage over total new marriages on female internal migration. I employ a two-way fixed effect model, using districts and province-by-year fixed effects. To impute causality, I leverage an instrumental variable based on migrants' network from past internal migration, known in the literature as a migrants' enclave instrument. I then investigate the implications that both gendered internal migration and international marriages have on fertility outcomes.

Overall, I find that the demand for foreign brides concentrates in districts with higher levels of out-migration of Korean women. In particular, I find that a 10 percent increase in *female flight* (i.e. the fraction of local women's outflow over total female internal migration[2]), raises the arrival of foreign brides in an average district by 4 percent, with a stronger effect in rural areas and especially in areas where local men share attitudes towards family and gender norms which are more conservative than the country's median. When I investigate the implications for fertility rates, I find that while out-migration of local women depresses fertility, the increase in international marriages partially offsets this negative effect.

Through the use of survey data, I document an increasing cultural gap between younger generations of men and women, related to gender roles and family norms. A descriptive analysis suggests that women's attitudes have become more and more gender egalitarian over generations, while men's views remain attached to more conservative values. I exploit the geographic variation in family conservatism of Korean males in the empirical analysis and I find that the effect of female flight on the demand for foreign brides is stronger in areas with higher concentration of men who share more conservative family values. This gap in family and gender values serves as a reinforcing mechanism for the demand for foreign brides, in addition to the shortage of local women.

I test the validity of my results with a series of robustness checks. I use different specifications for the empirical strategy, such as alternative forms for the measure of internal migration. I also perform the tests for the validity of the shift-share instrument (Goldsmith-

[1]This issue has been documented also by the Financial Times article "A new global gender divide is emerging".

[2]The proper definition of *female flight* is addressed in the section explaining the empirical strategy of the study.

Pinkham et al., 2020; Jaeger et al. 2018). To further address the possibility for endogeneoty of internal migration, I build an alternative empirical specification which exploits the geographic variation of progressive and conservative areas. In this alternative specification, I only use female outflows from conservative areas to predict the arrival of foreign brides in the following period and I build the instrumental variable using inflows into progressive areas as a shock. All the results confirm the validity of the baseline estimates.

To the extent of my knowledge, the literature studying migration and marriage, focuses mostly on international migration rather than internal migration (Adda et al. 2020, Carlana and Tabellini, 2018). While some evidence has been documented on how internal migration affects fertility rates (Daudin et al. 2019), this paper is the first to investigate the effect of internal migration on the marriage market in the modern society and more precisely, on the formation of international marriages. This paper contributes also to the migration literature that employs enclave instruments. However, differently from the existing literature in which the instrument is used to predict inflows at destination (Card 2009; Foged and Peri, 2016; Lewis, 2011; Morales 2018), I employ the instrument to predict outflows from origin.

This study relates also to the literature that explores the effects of demographic changes on marriage outcomes. The effect of gender imbalances, such as high or low sex ratios, on marriage formation have been extensively documented (Abramitzki et al. 2011; Grosjean et al., 2019; Rotz, 2016; Raymo and Park 2020). Migration can affect a country's sex ratio (i.e. the number of males over the number of females), which has important implications in the labor and the marriage market. In this paper, I show that the scarcity of marriageable women in the rural and conservative areas in a developed country, increases the number of brides imported from less developed countries.

Finally, this analysis contributes to the literature that studies the market for international marriages (Adda et al. 2020 and Tura 2020 for the European context; Ahn S.Y, 2020; Kawaguchi and Lee, 2016; Weiss and Zhang, 2018 for the Asian context). While the existing literature analyses the supply and the composition, the present study focuses on the factors affecting the demand side of international marriages and analyzes the consequences for fertility rates.

The paper is structured as follows. Section 2 discusses the background of the analysis, providing additional information on the context of international marriages in Korea. Section 3 introduces the the data and the empirical strategy. Section 4 discusses the results and section 5 concludes.

2 Background

2.1 The South Korean setting

South Korea went through fast and recent economic growth and urbanization. In the early 1960s over 40 percent of the South Korean population was in absolute poverty, but in 1996 the country became a OECD member and at present it ranks as the 13th world economy by Nominal GDP (Bank of Korea, 2023).

As economic development and human capital evolved fast, culture and traditions have kept a different pace. Korea has an ancient patriarchal tradition of son-preference and gender discrimination (Edlund and Lee, 2013; Choi and Hwang, 2015), scoring the highest gender-pay gap (34.6 percent) among developed countries (OECD, 2019). Misogynistic facts happening in South Korea are often reported by foreign media (The New York Times, 2021; 2023; The Guardian, 2019; 2021)[3] and marriage is still an obstacle for young Korean women who want to pursue a career. Married women in urban Korea are 40 to 60 percent less likely to participate in the labor force compared to single women (Lee et. al, 2008), and this trend is likely to be more pronounced in rural areas. Trying to pursue a career, many highly educated women remain single, contributing to the decline in marriage and birth rates (Raymo and Park, 2020; Hwang, J., 2016) and engage into geographic mobility, as migration significantly increases the likelihood for unmarried Korean women to find employment (Lee et. al, 2008)

While traditional gender roles have been retaining gender gaps from closing, the fast economic development and urbanization that took place in Korea from the early 1960s encouraged many women to move from rural into urbanized areas and join the labor force (Lee, Seol and Cho, 2006). The economic development allowed Korean women to increase their educational attainment and pursue economic and social independence. Korean women's enrollment rate in higher education outpaced men's since 2013 and in 2020 women's enrollment rate was 71.3 percent, 5 percent points higher than that of males (OECD, 2021). Although the increase in educational attainment helped Korean women gain access to more job opportunities, it has also contributed to the sharp decline of the marriage and fertility rate by increasing the opportunity cost of marriage (OECD, 2019). At the same time, while the opportunity cost of marriage kept increasing for Korean women, the number of marriages between local men and imported brides have become a more and more popular phenomenon taking place all over the country (Lee, H.K., 2008).

[3]Seoul's Advice to Pregnant Women: Cook, Clean and Stay Attractive (The New York Times, 2021); 'Don't look dishevelled': anger over Seoul city's advice to pregnant women (The Guardian, 2021).

2.2 International Marriages in South Korea

Among international marriages in South Korea, those between local men and foreign women are the most popular, which accounted for almost 10 percent of total new marriages in 2005 (Figure 1), while the share of those between local women and foreign grooms was below 4 percent that same year.[4] The top of Figure 2, in blue, shows the concentration of international marriages between Korean men and foreign women, over the period 2000-2019, where a darker area corresponds to higher concentration of marriages between Korean men and foreign brides. The bottom of Figure 2 instead, in red, shows (local) female internal net-migration, where a darker area corresponds to higher inflows of Korean women, and a lighter area to higher outflow. Overall, Figure 2 illustrates that the districts with higher concentration of international marriages, are those experiencing higher flight of local women. Hence, the data points at a positive relationship between Korean female flight and the arrival of foreign brides. Further, after distinguishing between urban and rural districts, it is clear that this phenomenon is predominant in rural areas (Figure 3).

The origins of this phenomenon can be traced back to the early 1990s, when the Korean economic growth and urbanization led many people in rural areas to move to the city. Many women abandoned their traditional role of housewives in rural areas and moved into urbanized ones to enter the labor force. Left behind in the rural parts of the country were farmers and fishermen, as males are those who traditionally look after the family business. Rural-to-urban migration not only decreased the population density in rural areas, but also increased the men-to-women ratio at marriage age for rural men, who usually have low income, are more conservative to patriarchal norms and represent the low-end of the marriage market (Kim and Torneo, 2012).

2.3 The "Mail-Order-Brides" Phenomenon

As rural men experienced difficulties in finding wives during urbanization, after the re-establishment of the relations with China in 1992, the Korean government started promoting marriages between rural bachelors and Korean-Chinese women. While they started as a rural phenomenon, international marriages quickly became more and more popular all over the country.

Arranged marriages were the most popular form of marriage in South Korea for older

[4]Historically, international marriages in South Korea rose after 1945, they were rather unpopular and mostly took place between Korean women and men usually from Japan, the United States and China. Fom 1995 marriages involving local men and foreign brides reversed the historical dominance of the former, rising up to almost 80 percent of total international marriages.

generations, like for many other Asian countries (Jones G.W., 2017). It was once the norm for parents to choose their children's spouses, based on the belief that marriages should be based on social status and family background rather than love. Even though the influence of Western culture in recent years has led to a decline in the popularity of arranged marriages, many people in South Korea use the service provided by marriage agencies: businesses which help single men and women to find a partner. The increasing popularity of marriage agencies and the rising number of marriages between local rural men and Korean-Chinese women in the early 1990s led the path for a new business to start: international marriage agencies. These agencies are actual mediators dealing between the demand (i.e. Korean bachelors) and the supply (i.e. foreign women willing to move to South Korea through marriage) of the international marriage market. These match-makers widened the supply of brides to many different countries, in particular to less economically developed countries in Southeast Asia, such as Vietnam or the Philippines (Lee H. K., 2008)

The business of international marriages in South Korea has been documented by foreign media for its peculiar management, the characteristics of the users and the fortunate or unfortunate outcomes [5]. International marriage agencies usually have agents in the country of supply, where women willing to move to South Korea through marriage are recruited (Seol, 2006). When a Korean man decides to marry a foreign bride from a certain country, the man will ask for the services of an agency dealing with that specific country, where he will be provided with a catalogue of available women. The fee paid to the agency [6] includes a trip to the country of origin of the woman, where the "future couple" meets for the first time and if agreed by both sides, a wedding between the two is organized and it usually takes place within one week from the day the couple has met. International marriages combined through the help of agencies happen very quickly and it is not uncommon that the partners in the newly married couple do not speak the same language, that there is incomplete information about the spouse at the time of the wedding or that the age difference between the spouses is larger than ten or fifteen years (often men who rely on these services are older than 35 years).

The Korean government has enacted a number of regulations throughout the years, in order to limit the possibility of human trafficking, to control domestic violence and to integrate foreign brides into the Korean society, as they often cannot speak Korean and are subject to social stigma (Lee, 2008; Choi and Byoun, 2014). Statistics from the Multicultural Family Survey (2012) give some intuition on the nature of this kind of marriages. Over a sample of 14,628 marriage migrants (i.e. individuals with a foreign nationality of

[5](e.g.: *The New York Times, 2007; The Washington Post, 2014; BBC, 2019; CNN, 2020*)

[6]which can range from $2,000 to $10,000, depending on the agency and the nationality of the bride

origin who married a Korean citizen), women represent 84.25 percent. Female marriage migrants are on average much younger than their Korean husband and are usually low skilled: for 70 percent of them the completed level of education does not go beyond the high school diploma. Most of these women come from China (35%) or Southeast Asia (40%). On the opposite, foreign men who married Korean women are more likely to have a college education (over 50% of the sample), and often come from Western countries (40%). More detailed information on international marriage migrants can be found in section H of the Appendix.

3 Empirical Strategy and Data

In this paper I estimate the effect of gendered internal migration on the demand for international marriages and I explore the implications for fertility rates. First, I regress the fraction of marriages between local men and immigrant women on female internal migration using districts fixed effects and province-by-year fixed effects. To impute causality, I build an instrumental variables based on past internal migration, known in the literature as immigrants enclave instrument. Then, I employ the same methodology to investigate the implications for fertility rates.

3.1 Data

For conducting this study, an extensive number of datasets was used. For the empirical analysis, I collected data from the Korean Statistic Office (KOSIS) at the district level, for a total of 223 districts[7]. In particular, the administrative data used to build the analysis include: the number of weddings between Korean men and foreign brides (2005-2019); the number of total weddings and of domestic weddings (2005-2019); resident population by gender and age groups (2005-2019); internal migration of Korean residents by gender and age groups (2005-2019); total fertility rate by year at the district level (2005-2019). Summary statistics of the variables are presented in Table1.

For the instrumental variable, I use the Internal Migration Census (2002-2004), which is a dataset that includes information at the individual level on respondents' district of

[7]From a total of 230 districts, I remove from the sample the city of Sejong, which was funded in 2012 and has missing information for most of the analysis. I aggregate the districts of Changwon, Masan and Jinhae, which were unified into one main district after July 2010. I further remove districts for which there was missing information for most of the years of analysis and I then obtain a final panel of 223 districts for the period 2005-2019.

origin and district of destination. This census provides migrants' demographic information such as gender and age, as well as reason to migrate[8]. For building the instrument, I aggregate the data at the district level in order to match it with the data used for the OLS specification.

To explore the level of conservatism for family and gender issues, two sources of survey data are used: the Korean Family, Welfare and Labor Survey (2002), and the World Value Survey (2001). These datasets provide individual level information on respondents' opinions to statements and question related to gender norms and family roles. Individuals' demographic information such as gender, age and education level are provided for both surveys, while the Korean Family, Welfare and Labor Survey (2002) also provides information on respondents' residency at the province/main city level.

3.2 Female Flight

In this study I estimate how the internal mobility of women at marriage age in a district affects the demand of foreign brides. The measure I use for internal migration is the ratio between a district's outflows over the total number of internal migrants by year. The fraction of inflows of people compared to the fraction of outflows in a district suggests the level of "attractiveness" of that district: a district can be defined *attractive*, if the number of people who move-in exceeds the number of people who move-out. In the same way, a district will be *unattractive*, if there are more people who decide to move away from it, compared to those moving in. Hence, to capture a measure of *unattractiveness* of a district for women at marriage age, I build a variable that I call *female flight*, as follows:

$$Female\ Flight_{c,t} = \left(\frac{Female\ Outflows}{Female\ Inflows + Female\ Onflows} \right)_{c,t} \tag{1}$$

Female flight is the ratio between the number of women migrating out of a district c and the the total number of internal migrants in that same district, for a given year t. If *female flight* is higher than 0.5, the number of women moving out will exceed that of women moving in, meaning that the district in question is rather unattractive. The value will be lower than 0.5 if the opposite is true. I use women at age 20-34 to build the variable as this age range represents the most common age range at marriage for women[9].

[8] Table 6 in the Appendix shows data on the main reasons for engaging into internal migration by gender: both women and men tend to engage into internal migration mostly for job-related motives.

[9] Figure 13 in the Appendix

3.3 Empirical Strategy: OLS

I estimate the effect of female internal migration on the demand for marriages with foreign women through an OLS regression in a two-way fixed effect model. For the period 2005-2019 I regress the number of marriages between local men and foreign brides in a given district and year, on the female flight of local women at marriage age that took place the previous year in that same district. I run the the following regressing equation:

$$\left(\frac{Brides}{Total\ Marriages}\right)_{c,t} = \beta_0 + \beta_1 female\ flight_{c,t-1} + \delta_c + \theta_{t*p} + \epsilon_{c,t} \tag{2}$$

where $\left(\frac{Brides}{Total\ Marriages}\right)_{c,t}$ is the fraction of foreign brides on total new marriages, in district c and year t. The regressor of interest is $female\ flight_{c,t-1}$, which is the ratio between the number of women at marriage age who moved out of district c and total female internal migrants at marriage age in the district, for year *t-1* (i.e. one year before international marriages take place). δ_c, θ_{t*p} are respectively district and province-by-year fixed effects, which control for districts-specific confounders and for year-specific confounders at the province level. $\epsilon_{d,t}$ is the error term. The coefficient of interest is β_1, which estimates the effect of female flight which took place at time $t-1$ on the number of foreign brides at time t. Standard errors are clustered at the district level. I then perform a series of robustness checks where I use different specifications for this analysis, which are presented in the Results section.

If the coefficient β_1 is positive and significant, it would suggest that there is a positive correlation between female flight and the demand for foreign brides, meaning that when the out-migration of local women is higher than the in-migration, men's demand for foreign spouses increases. On the contrary, a negative coefficient β_1 would indicate that the demand for international marriages concentrates in areas which are more attractive to local women, hence where female inflow is higher than female outflow.

3.4 Instrumental Variable: Enclave IV

As known from the literature of the economics of migration, migrants tend to self-select into the areas of destination, therefore the decision to move to a certain district may be affected by specific characteristics of the district. In the setting of this study, internal migrants may decide to move from places with high shares of international migrants, to places with a low share, which would bias the OLS estimates upward. On the other hand, the destination chosen by Korean women may coincide with more developed and urbanized areas,

which attract also international migrants. This would bias the OLS estimates downward. Moreover, the fixed effects used in the analysis control for district-specific time-invariant confounders and for year-specific confounders at the province level. Fixed effects do not control for the time variability of districts within the same province.

To control for these possible sources of endogeneity, I use an instrumental variable approach based on past internal migration patterns: an immigrant enclave instrument. The use of an enclave instrument is popular in the migration literature (Card, 2009), which is based on the assumption that networks are a strong determinant of location decision for migration, since networks assist with job search and assimilation into the new environment.

The use of a shift-share instrument in the context of internal migration rather than international migration is not new to the literature (Sharp M., 2020; Clement et al., 2019; Depetris-Chauvin and Santos, 2018; Morales J.S., 2018)[10]. For the framework of this analysis, I use an enclave IV to instrument female internal migration at marriage age in South Korea for the period 2005-2019, using data on past internal migration.

I build the instrumental variable using the stock of inflows and the stock of outflows of adult migrants (age> 18 years) in Korean districts during the period 2002-2004[11]. I use this "stock" to instrument inflows and outflows for the period 2005-2019, using the data provided by the *Internal Migration Census*, collected by the *Korean Statistics Office*, which provides information on district of origin, district of destination, gender and age of respondents. Unfortunately this data does not provide full information after the year 2010, which is the reason why I cannot use this dataset for the whole specification and I only use it for building the instrumental variable.

To build the instrument, inflows into districts of destination are used to predict outflows from the districts of origin:

$$Predicted\ Outflows_{o,t} = \sum_{d} inflows_{d,t} \times \lambda_{o,d_{02-04}} \tag{3}$$

Where d, o are respectively district of destination and of origin; $inflows_{d,t}$ is total number of people who moved into destination district d in year t; $\lambda_{o,d_{02-04}}$ is the fraction of internal

[10]Morales (2018) employs an enclave IV strategy to estimate the impact of internal displacement caused by the Colombian conflict on the wages of residents in the communities of destination. This type of instrument is used also by Depetris-Chauvin and Santos (2018), who study the causal impact of large inflows of internal displaced people on homicides in Colombian host districts, as well as by Clement et al. (2019) on the effect of Chinese internal migration on manufacturing production, or by Sharp M. (2020) who documents the labour market impacts of female internal migration at the end of the Aparthaid in South Africa

[11]Appendix E provides evidence which shows that the national shifts (i.e. the migration flows used for the main analysis and the migration stocks used for building the instrument) are not serially correlated, discarding the possible threats for the validity of the instrument which could arise from this issue.

migrants who moved into d from origin district o during the period 2002-2004. Therefore, $Predicted\ Outflows_{o,t}$ is the sum of the number of internal migrants who moved into the different destination districts d coming from the same district of origin o in year t. $Predicted\ Outflows_{o,t}$ is built using the number of migrants who moved into district d in year t and the fractions of migrants moving from origin district o into all destination districts d during the period 2002-2004 .

In the same way, outflows from districts of origin are used to predict inflows into district of destination:

$$Predicted\ Inflows_{d,t} = \sum_{o} outflows_{o,t} \times \gamma_{d,o_{02-04}} \tag{4}$$

Where $Predicted\ Inflows_{d,t}$ in destination district d in year t are built using the sum of $outflows_{o,t}$ from different districts of origin o in year t, interacted with the fractions of internal migrants in the period 2002-2004 who moved from each district of origin o to the same destination district d .

Finally, the Enclave IV used in this study is the ratio of instrumented outflows over the sum of both instrumented inflows and instrumented outflows:

$$Female\ FlightIV_{c,t} = \left(\frac{Outflows\ IV}{Inflows\ IV + Outflows\ IV} \right)_{c,t} \tag{5}$$

The variable $Female\ FlightIV_{c,t}$ is used to instrument the endogenous variable $FemaleFlight$.

3.5 Implications for Fertility Rates

I investigate the implications for fertility rates through two different steps. To understand the relationship between fertility rates and the two variables, I compute two separate regressions: I document the effect of *female flight* on a district's fertility outcomes and in a second step, I regress a district' fertility rates on the number of foreign brides. I instrument *female flight* with the enclave IV.[12]

3.5.1 Fertility Rates and Female Flight

I regress districts' *TFR* on *female flight*, to study the effect that female internal migration has on a district's fertility rate. I instrument female internal migration with the enclave IV. I expect higher outflows of women to have a negative effect on the number of new births, as more women at marriage age are leaving compared to those who arrive, reducing the

[12] An additional exercise is computed in Appendix, which regresses fertility rates on both female flight and foreign brides, in a unique equation.

fraction of women who could give birth in that district. I estimate the following equation, using different lags and leads of *female flight* in district c:

$$log(TFR)_{c,t} = \sum_{t-3}^{t+3} \beta log(female\ flight)_{c,t} + \delta_c + \theta_{t*p} + \epsilon_{c,t} \tag{6}$$

Where TFR is total fertility rate of district c and year t, regressed on $female\ flight$ from year $t-3$ to year $t+3$. δ_c and θ_{t*p} are district fixed effects and province-by-year fixed effects; $\epsilon_{c,t}$ is the error term. I then instrument *female flight* with the enclave instrument used for the main analysis.

3.5.2 Fertility Rates and Foreign Brides

I regress districts' *TFR* on the number of foreign brides, to analyze the correlation between the fraction of international marriages in a give area and the number of new births in that area. I expect the arrival of foreign brides to be positively correlated with fertility rate, as more international marriages bring more women who are potential new mothers in a given district and year.
As for the previous step, I estimate the equation using different lags and leads of *foreign brides* in district c:

$$log(TFR)_{c,t} = \sum_{t-3}^{t+3} \beta log(F\ Brides)_{c,t} + \gamma log(tot\ wedd)_{c,t} + \delta_c + \theta_{t*p} + \epsilon_{c,t} \tag{7}$$

Where TFR is total fertility rate of district c in year t, $F\ Brides$ is the the number of foreign brides for year t from year $t-3$ to year $t+3$. $tot\ wedd$ controls for the total number of new marriages in a given district and year. δ_c and θ_{t*p} are district fixed effects and year times province fixed effects; $\epsilon_{c,t}$ is the error term.

4 Results

4.1 Baseline Results

The baseline results are presented in Table 2. The positive coefficients show that in districts where the outflow of women at marriage age is higher than the inflow, the probability that foreign brides arrive in the next period increases. Results are statistically significant and

economically relevant. In particular, I find that a 10 percent increase in outflow over total internal migration in district c, will lead to an increase in the fraction of foreign brides of about 1.45 percent the following year. When disentangling between urban and rural areas, the effect is reduced to 0.9 percent in cities for columns (5) and (6), while it increases to 1.9 percent for provinces in columns (8) and (9), where there is higher variation of rural and urban areas. These results give additional evidence on rural areas being the most affected by the phenomenon, implying that foreign brides tend to concentrate in areas in which the scarcity of local women, driven by rural-to-urban internal mobility, is more pronounced.

The first stage estimates are presented in column (1) for the total sample, in column (4) for the sample with only main cities and in column (7) for the sample where main cities are excluded. The first stage estimates for *female flight* (measured as the ratio between internal outflows and total female internal migration) show that the Enclave IV is a good predictor of internal migration patterns, with F-stat values higher than 10, reported at the bottom of the table.

4.2 Lags and Leads of Female Flight

To further test the bias of the OLS estimates and the exogeneity of the instrument, I reproduce the estimates using different time lags and leads of the independent variable. The results of these lags and leads of the explanatory variable are reported in Table3 and the coefficients are plotted in Figure 6. From these results, it is clear how the instrument adjusts for the OLS estimates, which appear to be downward biased. The instrument corrects this bias, showing that past female internal migration is a determinant factor for the arrival of foreign brides. The coefficients also indicate that there is no relation between the number of international marriages and future female internal migration, ruling out the possibility for reverse causality. In addition, the figure suggests that the effect of female flight on the arrival if foreign brides persists up to three years after local women have left, with the strongest effect taking place one year after female flight.

4.3 Implications for Fertility Rates

I test the implications of female flight and the arrival of foreign brides on districts' fertility rates over the period of study. I run two different regressions. In the first one, I regress a district's fertility rate on different leads and lags of female flight, which is instrumented with the enclave instrument. Results are plotted in Figure 7 and show that as expected, female flight reduces fertility rate, as the number of women at age of fertility decreases in

the district and the effect is especially strong one year after local women have left. In the second step, I regress districts' fertility rates on different leads and lags of the number of foreign brides, controlling for the number of total new marriages. Results plotted in Figure 8 indicate that at the arrival of foreign brides, fertility rate drops. However, one year after foreign brides have arrived, the coefficient becomes positive and significant especially in rural areas, while for urban areas the coefficient decreases in magnitude, but it remains negative and not significant. It is important to recall that foreign brides arrive one year after female flight, suggesting that the drop in fertility at the time of arrival of foreign brides can be attributed to the effect of female flight from the previous year, rather then to international marriages.[13]

Overall, we can say that as female flight depresses fertility, international marriages help to set off the negative effect, but only partially. Moreover, when disentangling between urban and rural areas, it is clear that the positive effect of international marriages on fertility is stronger for rural areas, while the negative effect of female flight on fertility seems to be more persistent in urban districts.

4.4 Heterogeneity Analysis: Family Conservatism of Korean Men

The literature on marriage markets and gender norms in South Korea suggests that there is a diversion in gender values and family roles between men and women for younger generations (Raymo and Park, 2020; Kawaguchi and Lee, 2017). Korean traditions are based on the Confucian philosophy, which values women as housewives and mothers, while men are the breadwinners of the household. On the one hand, economic growth has been pushing women to become more and more educated[14] and to take part in the labor force.

In this section I document an increasing divergence between South Korean women and men, for values related to gender equality and traditional family roles. First, I provide descriptive evidence of the gender divergence over generations through the use of the Korean Family, Welfare and Labor Survey (2002). Then, I test empirically the evidence found in the descriptive analysis by performing a heterogeneity analysis, which exploits the geographic variation in family conservatism of Korean men.

[13] In a third exercise I regress fertility rate on both female flight and the number of foreign brides. Figure 16 plots the regression coefficients.

[14] The level of education of South Korean women has converged to that of men in the lates decades, as shown in Figure18 in Appendix.

4.4.1 The recent diversion in gender values in South Korea

The concept of positive assortative mating states that men differing in physical capital, education or intelligence, height, race, or many other traits will tend to marry women with like values of these traits (Backer, 1973). Becker's statement implies that a man or woman will tend to match with someone who shares similar characteristics, in terms of both physical traits and values. Hence, a man with patriarchal views will look for a woman who shares an idea of family that is similar to his. In the same way, a woman with gender egalitarian views on society and family roles, will look for a man who shares similar progressive values.

Through the use of the Korean Family, Welfare and Labor Survey (2002), I find evidence that the "traditional views" on women and gender norms are more persistent across generations of men rather than women. This diversion is likely to be determinant for the gap in the local marriage market that Korea has been experiencing.

In Figure4 I plot the answers to questions related to gender and family norms, dividing the sample of respondents into six age groups and by gender. The graph in the top left corner plots the mean of the answers to the question: who do you think should be in charge of the housework at home? In the graph in the top right corner, respondents are asked their opinion on marriage (whether one must get married, should get married or may or may not get married) and the graph in the bottom plots the views on "when it is optimal for women to have a job". For all questions, progressive responses corresponds to higher values on the *y axes*, while conservative views correspond to lower values. The different groups represent different generations of men and women, divided into 10 years age groups. The youngest age group is represented by individuals younger than 20 years old and the oldest by individuals older than 60 years old.

The plots clearly show that there is a diversion among younger generations between men and women, with men being more attached to traditional gender values and women sharing more progressive views. While for older cohorts the answers between men and women match (i.e. men and women of older cohorts share the same gender values), this is not true anymore for younger generations. For younger cohorts, the gap in gender values increases more and more, suggesting that young women demand more gender equality compared to men. The choice of using the Korean Family, Welfare and Labor Survey of 2002 for this investigation, rather than a more recent one, comes from the fact that young generations in 2002 are those going to be at marriage age in the main analysis. In addition, it allows to have a look at older generations, which emphasizes the gap in cultural evolution between males and females.

I further investigate the evolution of family values through the use of the World Value Survey (2001). Figure 5 plots the answers to two different statements. Similarly to Figure 4, respondents are divided by gender and into six age groups of ten years each, from people aged over 60 years old to people aged less than 20 years old. This time, differently from Figure 4, not only I plot the answers for South Korea, but also for Vietnam and the Philippines, two of the most popular countries of origin among foreign brides. The figure, as seen for the previous one, shows the gradual increasing diversion of views on gender and family roles between Korean men and women over generations. In addition, when comparing the plots of South Korea with those of the other two countries, trends appear to be very different. Not only it is clear that this increasing gender gap in values is limited to the Korean context, but also that women from Vietnam or the Philippines share views which are more similar to those of Korean men, compared to Korean women.

As predicted by Becker's statement, the descriptive analysis suggests that in terms of family and gender values, foreign brides suit as a better match for Korean men than Korean women do. Moreover, this analysis provides additional evidence for the framework presented by Kawaguchi and Lee (2017), who argue that international marriages are a response to the social gap in the Korean local marriage market: progressive women prefer to remain single rather than marry a men with traditional values, while men who share patriarchal views on family and society prefer to marry a foreigner with likewise values.

4.4.2 Conservative and Progressive Areas: Empirical Estimation

I exploit the geographical variation in conservatism identified with the use of the descriptive analysis to study the heterogenous effect of female internal migration on the formation of international marriages. To build the indexes for conservatism, I only include male respondents from the two youngest age cohorts, for which the diversion in gender views is the highest: men younger than thirty years old. The survey is collected at the province/main city level, so while I cannot detect conservatism at the district level, I can exploit the variation in conservatism for a total of 17 provinces/main cities.

I use two different methods to build the conservatism indexes. For the first index, I create a variable that takes value equal to 1 when men have a more conservative view than the country's median for the three questions from the Korean Family, Welfare and Labor Survey of 2002: opinion on housework, opinion on marriage and opinion of female employment. I then categorize main cities and provinces as "conservative" when the share of men with progressive views is below the sample median. Then, to build the second index of conservatism I use the three survey variables to build an indicator for conservatism

through a Principal Component Analysis (PCA). I then take the mean of the index at the province/main city level and I categorize cities and provinces as "progressive" when the share of men with progressive views is over the sample median and as "conservative" when the share of men with progressive views is below the median. After conservative and progressive districts are identified through the use of the two indexes, I split the sample accordingly and run the empirical analysis from equation (2) for each subsample.

The results for both specifications are presented in Table 4 and confirm the hypothesis that the demand for foreign brides concentrates where there is a higher presence of conservative men. Columns (1) to (4) of Table 4 present the results for the first index. Columns (1) and (2) show results for cities and provinces where men have a more progressive view (i.e. cities and provinces where the share of men with progressive views is over the median). Columns (3) and (4) instead, include cities and provinces where there is higher presence of men who share conservative views related to gender and family issues. The second index is built through the use of a Principal Component Analysis (PCA) and columns (4) to (8) of Table 4 show the results, which are perfectly in line with those found by using the first index: the positive effect of female flight on the demand for foreign brides concentrates only in areas which are characterized by a higher presence of conservative men.

4.5 Alternative Empirical Strategy: Outflows from Conservative Areas

To further address the possibility for endogeneoty of internal migration, I further exploit the geographic variation of *progressive* and *conservative* areas for the empirical design. I only keep *conservative* areas in the sample for the main analysis and I investigate the effect of *outflows* of Korean women at marriageable age on the demand for foreign brides in the following period. I run the following regression equation:

$$log(F\ Brides)_{c,t} = \beta_1 log(fem\ outflow)_{c,t-1} + \beta_2 log(fem\ inflow)_{c,t-1} + \delta_c + \theta_{t*p} + \epsilon_{c,t} \tag{8}$$

Where $F\ Brides$ is the number of marriages between Korean men and foreign women in a certain district and year. $fem\ outflow$ is the number of women at marriage age who move out of the conservative district in year $t-1$, while $fem\ inflow$ is the number of women at marriage age who move into the conservative district. δ_c and θ_{t*p} are district fixed effects and province-by-year fixed effects; $\epsilon_{c,t}$ is the error term. To build the instrumental variable, I use inflows into *progressive* areas as a shock, to predict outflows from conservative areas

during the period of the analysis:

$$Predicted\ Outflows_{C,t} = \sum_{d} inflows_{P,t} \times \lambda_{C,P_{02-04}} \tag{9}$$

Where C, P are respectively *Conservative* districts of origin and *progressive* districts of destination. $inflows_{P,t}$ is total number of people who moved into destination Progressive district P in year t; $\lambda_{C,P_{02-04}}$ is the fraction of internal migrants who moved into the *Progressive* districts P from the same *Conservative* district C during the period 2002-2004. Therefore, $Predicted\ Outflows_{C,t}$ is the sum of the number of internal migrants who moved into the different *Progressive* destination districts d coming from the same *Conservative* district of origin C in year t. $Predicted\ Outflows_{C,t}$ is built using the number of migrants who moved into *Progressive* districts P in year t and the fractions of migrants moving from a *Conservative* origin district C into all the different *Progressive* destination districts P during the period 2002-2004 .

In a second specification, I build the enclave instrument also after restricting the sample of historic internal movers to only adult women (at least 18 years old) moving for education or work reasons.

The enclave instrument assigns estimated outflows from conservative areas into progressive ones, based on settlement patterns during the years 2003-2004[15]. The shift-share instrument does not simply assign migrants from more conservative areas to more progressive areas. Rather, it combines two sources of variation: variation in the "mix" of people coming from different conservative districts and living in different progressive districts, in the pre-period (2003-04); and time-series variation in emigration rates of local women at marriageable age, from different conservative areas for each year in the period 2005-2019. Conditional on its 2002-2004 share of inflows into progressive areas, a conservative district is predicted to have higher outflows of local women in a given year only if in the pre-period progressive areas received a higher fraction of migrants originated from that conservative district.

The results presented in Table 5 are consistent with the hypothesis that conservatism is the mechanism pushing local women away, increasing the demand for women who embrace a more traditional view of gender roles and family values. It is confirmed the hypothesis that higher outflows of local women at marriage age from a conservative district, will increase the demand for international marriages in the following period. I built the instrument using two different samples of movers: for columns (1) to (4) people at age 18 or older moving from conservative to progressive areas in years 2002-2004 were employed; for columns (5)

[15]Before year 2003 there is no information available fot the reason why internal migrants move.

to (8), only women at age 18 or older who moved for reasons related to work or education in the period 2003-2004 were employed to build the enclave instrument. For this second part, the year 2002 was not included because reasons were not specified in the migration census. Results are consistent with the hypothesis for both instruments and for both the Indexes of Conservatism built (i) though Principal Component Analysis in columns (1)-(2) and (5)-(6) and (ii) built in a categorical way in columns (3)-(4) and (7)-(8). In particular, I can say that in conservative areas, the outflow of local women increases the demand for foreign brides, while inflows of local women decreases it.

4.6 Robustness Checks

4.6.1 Different Definition of Female Flight

In Table 7 I repeat the baseline estimates, using an alternative definition of *female flight*:

$$Female\ Flight_{c,t} = \left(\frac{Female\ Outflows}{Female\ Inflows} \right)_{c,t} \tag{10}$$

In this specification, *female fflight* is defined as the ratio between the number of women migrating out of a municipality and the number of women moving in. If *female flight* is higher than 1, the number of women moving out will exceed that of women moving in, meaning that the municipality in question is rather unattractive. The value will be lower than 1 if the opposite is true. When using this different specification for the main regressor, results are consistent and the instrument acquires more power. Also in this case, the positive effect of female flight on the demand for immigrant brides is confirmed.

4.6.2 Sex Ratio at Marriage Age

The effect of female flight on the demand for foreign brides is likely to be determined through the effect that female internal migration has on a district's sex ratio (i.e. the ratio between the number of men over the number of women) at marriage age. Since female flight affects a district's sex ratio, this variable is excluded from the main specification of the empirical analysis, because it would act as a bad control. However, as a robustness check I add a district's sex ratio at marriage age as a control variable. Table 8 presents the results, which remain unchanged.

4.6.3 Male Flight

A possible concern for the analysis could be that rather than female internal migration, it is rural-to-urban migration in general that leads to the arrival of foreign brides in a certain place. To check for this, I add to the analysis a control for *male flight*: the ratio between the number of outflows and the and the total number of male migrants at marriage age by district. Table 9 reports the results of this test and can be found in the Appendix.

Due to the collinearity between female and male migration, when male flight is included into the equation, the coefficients explode in terms of magnitude and the estimates lose precision, especially for the IV results. Nevertheless, the sign of the coefficients respect and confirm the expectations: male flight is negatively correlated with the arrival of foreign brides. The districts in which the number of men moving out is higher than that of men moving in, are not going to become the destination areas for future foreign brides. In contrast, the correlation between female flight and the arrival of foreign brides does not change: the areas where local women tend to move out rather than move in, are going to be the destination of foreign women who marry local men. Hence, these results suggest that it is not rural-to-urban migration in general to trigger the arrival of foreign brides, but it is female flight specifically.

4.6.4 Shift Share IV: Validity Test

A possible concern for the Enclave Instrument used in this analysis is that the fraction of women migrating to or from certain districts during the period 2002-2004, might be associated with the arrival of foreign brides in the period of the analysis. In particular, the power of the Enclave instrument could be driven by few districts that have the highest power in generating the identifying variation of the instrument. Hence, following Goldsmith-Pinkham et al. (2020), I calculate how relevant each districts is for building the instrument.

To test whether the districts with highest weights in generating the variation of the instrument drive the 2SLS results, I exclude them one by one when building the instrumental variable. If estimates are not stable to the exclusion of these districts, the exclusion restriction, necessary for the validity the instrument, could be threatened. Table 11 in the Appendix presents the results of 2SLS estimates: the coefficient is stable when excluding internal migrants coming from or moving to these districts.

5 Conclusion

This paper provides empirical evidence on the effect of internal migration on the international marriage market and fertility rates. In particular, with this analysis I show how female internal migration affects the demand for international marriages between local men and foreign brides in South Korea. International marriages are a phenomenon that has become more and more popular in first world countries, especially between local men and women from less developed countries of origin. The developed world is facing decreasing rates of marriage and fertility, alarming demographic forecasts and raising the attention of policy makers.

This study evaluates whether there is a connection between the flight of local women from certain districts and the number of international marriages between local bachelors and foreign women and investigates the outcomes related to fertility rates. Through the use of an empirical analysis, using a two-way fixed effects model and an instrumental variable approach based on past migration trends, I find that South Korean districts experiencing *female flight* (measured as the fraction of outflows over total internal migrants for women at marriage age), are more likely to be the destination for marriages between local men and foreign women.

Concerning fertility, I find that *female flight* affects fertility negatively by reducing the availability of women and that the arrival of foreign brides helps to offset this negative effect, but not completely. When I distinguish between rural and urban areas for the empirical strategy, I find that the effect is stronger in rural areas. However, I also find that the reduction in local marriages driven by the shortage of marriageable women is not sufficient to fully explain the demand for immigrant brides.

I hypothesize that conservatism related to family and gender roles is likely to determine the flight of Korean women on the demand for foreign ones. I provide evidence that the demand for brides from less developed and more conservative countries comes mostly from areas where men tend to have more conservative and patriarchal views. Results are robust to a set of different tests and specifications: in districts where female internal outflows at marriage age are higher than inflows, the likelihood that local men marry foreign brides in the following years increases especially in conservative areas, while almost no effect is found in progressive ones. I also show that there is an increasing divergence in family values between younger generations of Korean women and men, with women becoming more and more progressive, while men seem to prefer more traditional family views and roles. In addition, the analysis shows that on the other hand, women in the countries of origin of foreign brides tend to have attitudes towards gender and the family which are

more conservative and hence, they make a better match for more conservative Korean men.

Overall, I find that a 10 percent increase in *female flight* in an average district and year, leads to an increase in the rate of international marriages of 1.4 percent in that district, the following year. In rural areas, this effect rises to almost 2 percent. Throughout this analysis I provide evidence on the possible marriage responses and consequences on fertility to demographic changes that arise from gendered internal migration. Policy makers intending to foster gender equality and to increase fertility rates in developed countries, should take into consideration factors affecting economic-driven migration by gender, as well as its effect on family formation. More attention should be driven on the factors affecting the increase in the opportunity cost of having children for women, to what extent and how the evolution of social norms affects women's economic decision. The present study shows that while the rise in international marriages helps reducing the fall in fertility, its effect is limited. Future research should better investigate the role of men's conservative attitudes towards gender norms and family roles in affecting gendered migration and women's economic opportunities.

Bibliography

Alesina, A., Harnoss, J. and Rapoport, H., 2016. Birthplace diversity and economic prosperity. Journal of Economic Growth, 21(2), pp.101-138.

Ahn, S. Y. (2021). Matching across Markets: An Economic Analysis of Cross-Border Marriage. HCEO Working Paper Series.

Antecol, H., Cobb-Clark, D.A. and Trejo, S.J., 2003. Immigration policy and the skills of immigrants to Australia, Canada, and the United States. Journal of Human Resources, 38(1), pp.192-218.

Borjas, G.J. (2003). The labor demand curve is downward sloping: Reexamining the impact of immigration on the labor market. The quarterly journal of economics, 118(4), pp.1335-1374.

Bulte, E., Heerink, N. and Zhang, X. (2011). China's one-child policy and 'the mystery of missing women': ethnic minorities and male-biased sex ratios. Oxford Bulletin of Economics and Statistics, 73(1), pp.21-39.

BBC, 2019. South Korea shocked by abuse of 'marriage migrants' - https://www.bbc.com/news/world-asia-48917935

Card, D., 2009. Immigration and inequality. American Economic Review, 99(2), pp.1-21.

Cattaneo, A. and Robinson, S., 2019. Economic development and the evolution of internal migration. Moving in steps, returnees, and gender differences. ESA Working Paper.

Choe, M.K. and Retherford, R.D. (2009). The contribution of education to South Korea's fertility decline to 'lowest-low'level. Asian Population Studies, 5(3), pp.267-288.

Choi, G.Y. and Byoun, S.J., 2014. Domestic violence against migrant women in South Korea: Addressing the needs of a uniquely situated victim population in domestic violence policy. International Social Work, 57(6), pp.645-660.

Choi, Eleanor Jawon, and Jisoo Hwang. 2015. "Child Gender and Parental Inputs: No More Son Preference in Korea?" American Economic Review, 105 (5): 638-43.

Choi, E.J. and Hwang, J., 2020. Transition of son preference: evidence from South Korea. Demography, 57(2), pp.627-652.

CNN, 2020. South Korean authorities encourage men to marry foreign women. But their brides often become victims of abuse.

Daudin, G., Franck, R. and Rapoport, H., 2019. Can internal migration foster the convergence in regional fertility rates? Evidence from 19th century France. The Economic Journal, 129(620), pp.1618-1692.

Depetris-Chauvin, E. and Santos, R.J., 2018. Followed by violence: Forced immigration and homicides (No. 513).

Docquier, F. and Rapoport, H., 2012. Globalization, brain drain, and development. Journal of economic literature, 50(3), pp.681-730.

Edlund, L. and Lee, C., 2013. Son preference, sex selection and economic development: The case of South Korea (No. w18679). National Bureau of Economic Research.

Financial Times, January 26 2024. "A new global gender divide is emerging".

Fouka, V., Mazumder, S. and Tabellini, M., 2022. From immigrants to Americans: Race and assimilation during the Great Migration. The Review of Economic Studies, 89(2), pp.811-842.

Foged, M. and Peri, G., 2016. Immigrants' effect on native workers: New analysis on longitudinal data. American Economic Journal: Applied Economics, 8(2), pp.1-34.

Goldsmith-Pinkham, P., Sorkin, I. and Swift, H. (2020). Bartik instruments: What, when, why, and how. American Economic Review, 110(8), pp.2586-2624.

Grosjean, P. and Khattar, R., 2019. It's raining men! Hallelujah? The long-run consequences of male-biased sex ratios. The Review of Economic Studies, 86(2), pp.723-754.

Hwang, J., (2016). Housewife,"gold miss," and equal: the evolution of educated women's role in Asia and the US. Journal of Population Economics, 29(2), pp.529-570.

Imbert, C., Seror, M., Zhang, Y. and Zylberberg, Y., (2018). Migrants and firms: Evidence from China.

Jones, G.W., 2017. Changing marriage. Routledge handbook of Asian demography, p.351.

Kanbur, R. and Rapoport, H., 2005. Migration selectivity and the evolution of spatial inequality. Journal of economic geography, 5(1), pp.43-57.

Kawaguchi, D. and Lee, S. (2017). Brides for Sale: Cross-Border Marriages and Female Immigration. Economic Inquiry, 55(2), pp.633-654.

Kim, J., Yang, S.B. and Torneo, A.R., 2012. Marriage Immigration and Gender in South Korea: Accounting for Gender Disparities in International Marriages. Asia-Pacific Social Science Review, 12(2).

Koh, E. (2008). Gender issues and Confucian scriptures: Is Confucianism incompatible with gender equality in South Korea? Bulletin of the School of Oriental and African Studies, pp.345-362.

Korean Statistics Office, Internal Migration Survey (2002-2005)

Korean Statistics Office, Korean Family, Welfare and Labor Survey (2002)

Korean Statistics Office, Statistics on age at first marriage (2000-2019)

Korean Statistics Office, Statistics on internal migration by gender and age group (2000-2019)

Korean Statistics Office, Statistics on weddings between Korean grooms and foreign brides (2000-2019)

Lagakos, D., 2020. Urban-rural gaps in the developing world: Does internal migration

offer opportunities?. *Journal of Economic Perspectives*, 34(3), pp.174-92.

Lee, B.S., Jang, S. and Sarkar, J., (2008). Women's labor force participation and marriage: The case of Korea. Journal of Asian Economics, 19(2), pp.138-154.

Lee, Y.J., Seol, D.H. and Cho, S.N. (2006). International marriages in South Korea: The significance of nationality and ethnicity. *Journal of Population Research*, , 23(2), pp.165-182.

Lee, H.K. (2008). International marriage and the state in South Korea: Focusing on governmental policy. Citizenship studies, 12(1), pp.107-123.

Lewis, E., 2011. Immigration, skill mix, and capital skill complementarity. The Quarterly Journal of Economics, 126(2), pp.1029-1069.

Levy, M.B. and Wadycki, W.J. (1974.) Education and the decision to migrate: An econometric analysis of migration in Venezuela. Econometrica: journal of the Econometric Society, pp.377-388.

McKenzie, D. and Rapoport, H., 2011. Can migration reduce educational attainment? Evidence from Mexico. Journal of Population Economics, 24(4), pp.1331-1358.

Malamud, O. and Wozniak, A. (2012). The impact of college on migration evidence from the Vietnam generation. Journal of Human resources, 47(4), pp.913-950.

Morales, J.S. (2018). The impact of internal displacement on destination communities: Evidence from the Colombian conflict. Journal of Development Economics, 131, pp.132-150.

Munshi, K. (2003). Networks in the modern economy: Mexican migrants in the US labor market. The Quarterly Journal of Economics, 118(2), pp.549-599.

Munshi, K. and Rosenzweig, M., 2016. Networks and misallocation: Insurance, migration, and the rural-urban wage gap. American Economic Review, 106(1), pp.46-98.

OECD (2019). Society at a Glance, OECD Social Indicators.

OECD (2019). "Rejuvenating Korea: Policies for a Changing Society"

OECD (2021), "Adult education level" (indicator), https://doi.org/10.1787/36bce3fe-en.

OECD (2021), "Gender equality: Korea has come a long way, but there is more work to do".

Ottaviano, G.I. and Peri, G. (2012). Rethinking the effect of immigration on wages. Journal of the European economic association, 10(1), pp.152-197.

Park, H., Lee, J. K., & Jo, I. (2013). Changing relationships between education and marriage among Korean women. Korean Journal of Sociology, 47(3), 51–76.

Park, H., & Smits, J. (2005). Educational assortative mating in South Korea: Trends 1930–1998. Research in Social Stratification and Mobility, 23, 103–127.

Park, Y.J., (1990). Korean Patterns of Women's Labor Force Participation During the Period, 1960-1980. Korea journal of population and development, pp.71-90.

Raymo, J.M. and Park, H., (2020). Marriage decline in Korea: Changing composition of the domestic marriage market and growth in international marriage. Demography, 57(1), pp.171-194.

Ruyssen, I. and Salomone, S., (2018). Female migration: A way out of discrimination?. Journal of Development Economics, 130, pp.224-241.

Rotz, D., 2016. Why have divorce rates fallen?: The role of women's age at marriage. Journal of Human Resources, 51(4), pp.961-1002.

Sandell, S.H., (1977). Women and the economics of family migration. The Review of Economics and Statistics, pp.406-414.

Schwartz, C.R. and Mare, R.D. (2005). Trends in educational assortative marriage from

1940 to 2003. Demography, 42(4), pp.621-646.

Seol, D.H., 2006. International matchmaking agencies in Korea and their regulation policies. In Asia Culture Forum (Vol. 8, pp. 1-10).

Sharp, M., (2020). The labour market impacts of female internal migration: Evidence from the end of Apartheid. Regional Science and Urban Economics, p.103624.

Shin, D.C., (2005). Recent experience of and prospects for high-speed rail in Korea: Implications of a transport system and regional development from a global perspective (No. 2005, 02). Working Paper.

Tabellini, M. (2020) Gifts of the immigrants, woes of the natives: Lessons from the age of mass migration. The Review of Economic Studies, 87(1), 454-486.

The Guardian, 2019. Politician scolds female professor for not having child

The Guardian, 2021. 'Don't look dishevelled': anger over Seoul city's advice to pregnant women.

The New York Times, 2007. Korean Men Use Brokers to Find Brides in Vietnam.

The New York Times, 2021. Seoul's Advice to Pregnant Women: Cook, Clean and Stay Attractive.

The New York Times, 2023. Women in South Korea Are on Strike Against Being 'Baby-Making Machines'

The Washington Post, 2014. Bride school: Where South Korea's mail-order wives learn their trade.

Weiss, Y., Yi, J. and Zhang, J., 2018. Cross-border marriage costs and marriage behavior: Theory and evidence. International Economic Review, 59(2), pp.757-784.

World Value Survey (2001), Philippines

World Value Survey (2001), South Korea

World Value Survey (2001), Vietnam

Tables

Table 1: Summary Statistics

Variables	*Mean.*	*SD*	*Min*	*Max*	*Obs*
Panel A: Key Outcomes and Controls					
Foreign brides (%)	9	5.1	0	38	3,345
Foreign brides	91.61	89.40	0	758	3,345
Tot. weddings	1,282.58	1,341.10	40	8,615	3,345
Tot. population	219,107.8	208,761.3	9,538	1,202,628	3,345
Female pop.	109,563	104,643	4,387	596,793	3,345
TFR	1.25	0.27	0.50	2.53	3,345
Panel B: Internal Migration					
Fem. inflows	5,668.27	6,237.47	114	46,074	3,345
Fem. outflows	5,533.50	6,040.46	159	42,153	3,345
Panel C: Enclave IV, stock = 2002 - 2004					
Fem. Predicted inflows	5,654.33	5,635.60	204.41	35,504.57	3,345
Fem. Predicted outflows	5,631.44	4,930.80	250.79	27,766.78	3,345

Notes: The sample includes a panel of 223 Korean districts from year 2005 to 2019. Statistics are calculated at the district level. To calculate brides ratios, the number of foreign brides is scaled on total weddings. Data on internal migration are collected for women at marriage age, who are women whose age ranges between 20 and 34 years old. Administrative data collected from the Korean Statistics Office (KOSIS).

Table 2: Main Estimates and First Stage - *Dep. Variable* = $\frac{foreign\ brides}{total\ weddings}$

	All districts			Urban			Rural		
	(1) First stage	(2) OLS	(3) IV	(4) First stage	(5) OLS	(6) IV	(7) First stage	(8) OLS	(9) IV
Fem outflows/tot mig (t-1)		0.125***	0.145***		0.112***	0.093*		0.134***	0.191**
		(0.013)	(0.040)		(0.014)	(0.041)		(0.019)	(0.070)
Fem outflows/tot mig IV	1.862***			2.725***			1.449**		
	(0.368)			(0.486)			(0.416)		
Obs.	3122	3122	3122	1022	1022	1022	2100	2100	2100
Clusters	223	223	223	73	73	73	150	150	150
F-stat F	25.51			31.36			12.14		

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at the district level in parentheses. The table presents results for a balanced panel of 223 Korean districts, over the period 2005-2019. Column (2) shows OLS estimates, while column (3) shows IV estimates. The dependent variable is the ratio of the number of foreign brides on total new weddings. *Fem outflows/tot mig* is the fraction of women aged 20-34 who moved out of a district at time t over the total number of migrant women of the same age group who moved in or out that district in the same year. *Fem outflows/tot mig* is instrumented using *Fem outflows/tot mig IV*, based on past internal migration. The instrument is predicted using the stock of internal migrants during the period 2002-2004. Column (1) presents the first stage results, where the dependent variable is *Fem outflows/tot mig*. For columns (4) to (6) I repeat the estimates including only main cities, where districts are almost entirely urbanized. For columns (7) to (9) I repeat the estimates excluding main cities and keeping only provinces, where the presence of rural areas is higher. For all estimates I weight for total population at the district level. The analysis includes district fixed effects and province-by-year fixed effects.

Time-lapse of internal migration

Table 3: Dep. Variable: *Foreign brides ratio*

	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV	(7) OLS	(8) IV	(9) OLS	(10) IV	(11) OLS	(12) IV	(13) OLS	(14) IV
Fem. Flight(t-3)	0.053***	0.093**												
	(0.013)	(0.034)												
Fem. Flight(t-2)			0.078***	0.120***										
			(0.012)	(0.034)										
Fem. Flight)(t-1)					0.125***	0.145***								
					(0.013)	(0.040)								
Fem. Flight							0.124***	0.135**						
							(0.014)	(0.046)						
Fem. Flight(t+1)									0.041*	0.024				
									(0.017)	(0.056)				
Fem. Flight(t+2)											0.024	0.018		
											(0.017)	(0.047)		
Fem. Flight(t+3)													0.016	0.009
													(0.016)	(0.046)
Obs.	2676	2676	2899	2899	3122	3122	3345	3345	3122	3122	2899	2899	2676	2676
Clusters	223	223	223	223	223	223	223	223	223	223	223	223	223	223
F-stat		27.14		26.50		25.51		27.72		28.77		30.85		28.65

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at the district level in parentheses. The table presents results of estimates with *female flight* at different points in time relative to weddings between local men and foreign brides which took place in year *t*. The main regressor is *female flight*, which is defined as the fraction of outflows of women aged 20-34 in a certain district and year on the total number of female internal migrants in that district and year. Column (1) and (2) show OLS and IV results with *female flight* lagged at time t-3. Columns (3) and (4) show OLS and IV with *female flight* lagged at t-2. Columns (5) and (6) are the baseline estimates, with *female flight* lagged at t-1. Columns (7) and (8) are OLS and IV estimates with *female flight* in the same year when weddings between Korean men and foreign brides take place. Columns (9) and (10) are OLS and IV estimates with *female flight* at time t+1. In columns (11) and (12) estimates are computed with*female flight* at time t+2 and columns (13) and (14) with *female flight* at time t+3. All specifications include population weights, district fixed effects and province*year fixed effects.

Foreign Brides and Conservatism

Conservative vs Progressive areas - indexes based on the three variables from the Korean Family, Welfare and Labor Survey (2002)

Table 4: Conservatism - *Dep. Variable* = $\frac{foreign\ brides}{total\ weddings}$

	Progressive		Conservative		Progressive - PCA		Conservative - PCA	
	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV	(7) OLS	(8) IV
Fem outflows/tot mig (t-1)	0.105***	0.124	0.135***	0.150***	0.119***	0.147	0.129***	0.144**
	(0.024)	(0.109)	(0.015)	(0.041)	(0.022)	(0.091)	(0.016)	(0.043)
Obs.	1316	1316	1806	1806	1568	1568	1554	1554
Clusters	94	94	129	129	112	112	111	111
F-stat		18.15		16.55		21.60		15.53

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at the district level in parentheses. The table presents results for a balanced panel of 223 Korean districts and 17 cities/provinces, over the period 2005-2019. The table presents regression results by district's level of conservatism. For columns (1) to (4), the estimates are obtained through a categorical conservatism index, while columns (5) to (8) presents results obtained using an index for conservatism obtained through a principal component analysis (PCA). Columns (1), (2) and columns (5), (6) include only cities and provinces where men tend to have attitudes towards family and gender roles which are more progressive than the median. Columns (3), (4) and columns (7), (8) present results for cities and provinces where men have gender attitudes which are more conservative than the country's median. Both conservative indexes are obtained through the three measures of conservatism from the Korean Family, Welfare and Labor Survey (2002)

Female Outflow from Conservative Areas

To further address the possibility for endogeneoty of internal migration, I exploit the geographic variation of *progressive* and *conservative* areas for the empirical design. I only use *conservative* areas for the main analysis and employ the *outflows* of Korean women at marriageable age to predict the arrival of foreign brides in the following period. I also include a control for *inflows* into the conservative districts. To build the instrumental variable, I use inflows into *progressive* areas as a shock, to predict outflows from conservative areas during the period of the analysis. To further reduce the possibility for endogeneity, I build the enclave instrument also after restricting the sample of internal movers to only adult women (at least 18 years old) moving for education or work reasons (columns (5)-(8) of Table5. Columns (1)-(2) and columns (5)-(6) of Table5 include districts identified with the Conservative Index built through the Principal Component Analysis, while columns (3)-(4) and (7)-(8) include districts identified with the categorical Conservative Index. Results confirm that in conservative areas, the outflow of local women at marriage age raises the demand for foreign brides.

Table 5: Conservatism - *Dep. Variable* = $log(foreign\ brides)$

	IV all movers				**IV women moving for work**			
	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV	(7) OLS	(8) IV
Log(Outflows) t-1	0.553***	2.446***	0.575***	2.563***	0.553***	2.855***	0.575***	1.997**
	(0.103)	(0.605)	(0.118)	(0.697)	(0.103)	(0.763)	(0.118)	(0.598)
Log(Inflows) t-1	0.0434	-0.854**	0.0385	-0.861*	0.0434	-1.048**	0.0385	-0.605*
	(0.063)	(0.311)	(0.071)	(0.341)	(0.063)	(0.382)	(0.272)	(0.197)
Obs.	1623	1623	1273	1273	1623	1623	1273	1273
Clusters	126	126	84	84	126	126	84	84
F-stat		9.81		8.70		9.20		14.19
Index type	PCA	PCA	CAT	CAT	PCA	PCA	CAT	CAT

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at the district level in parentheses. The estimates were computed including only conservative areas, for the period 2005-2019. The enclave instrument was built using inflows into progressive areas from conservative areas, based on the fraction of people who moved from conservative to progressive areas in years 2002-2004. *Inflows* into conservative areas are added as a control variable. For columns (1) to (4), the instrument was built using the fraction of people at age 18 or older, moving from conservative to progressive areas in years 2002-2004. For columns (5) to (8), only women at age 18 or older who moved for reasons related to work or education in the period 2003-2004 were employed to build the enclave instrument. For this second part, the year 2002 was not included because reasons were not specified in the migration census. Columns (1)-(2) and columns (5)-(6) of Table5 include districts identified with the Conservative Index built through the Principal Component Analysis, while columns (3)-(4) and (7)-(8) include districts identified with the categorical Conservative Index.

Figures

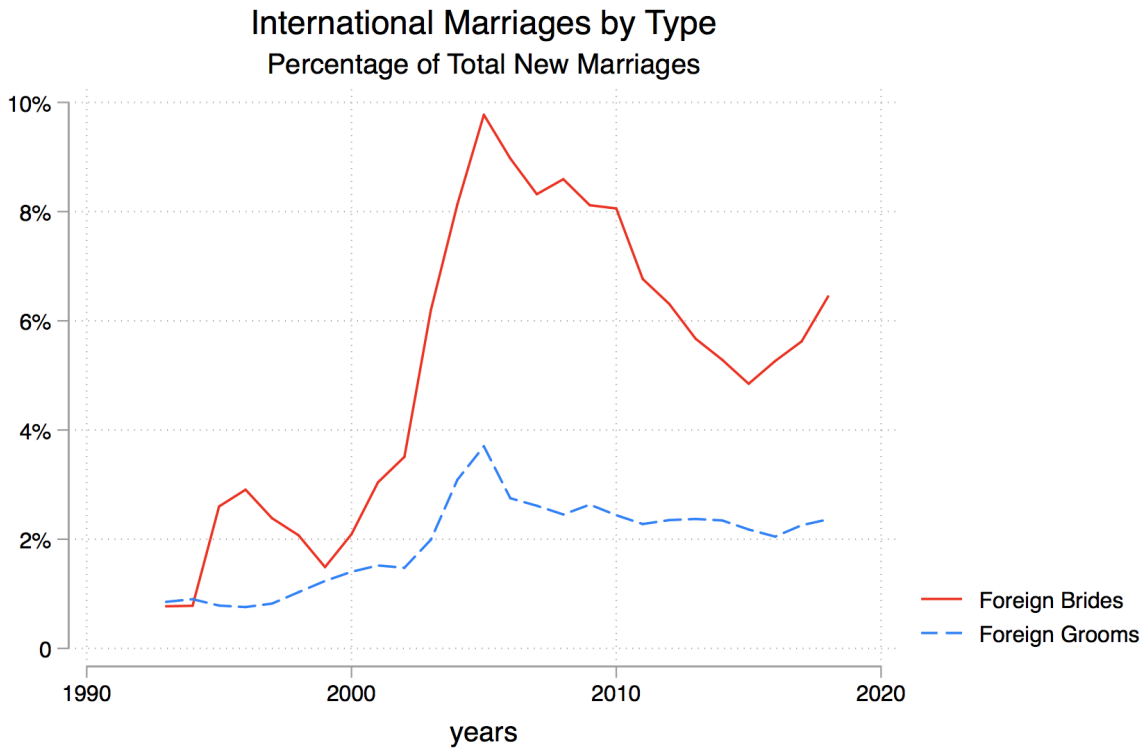

Figure 1: International marriages by type, 1993-2019

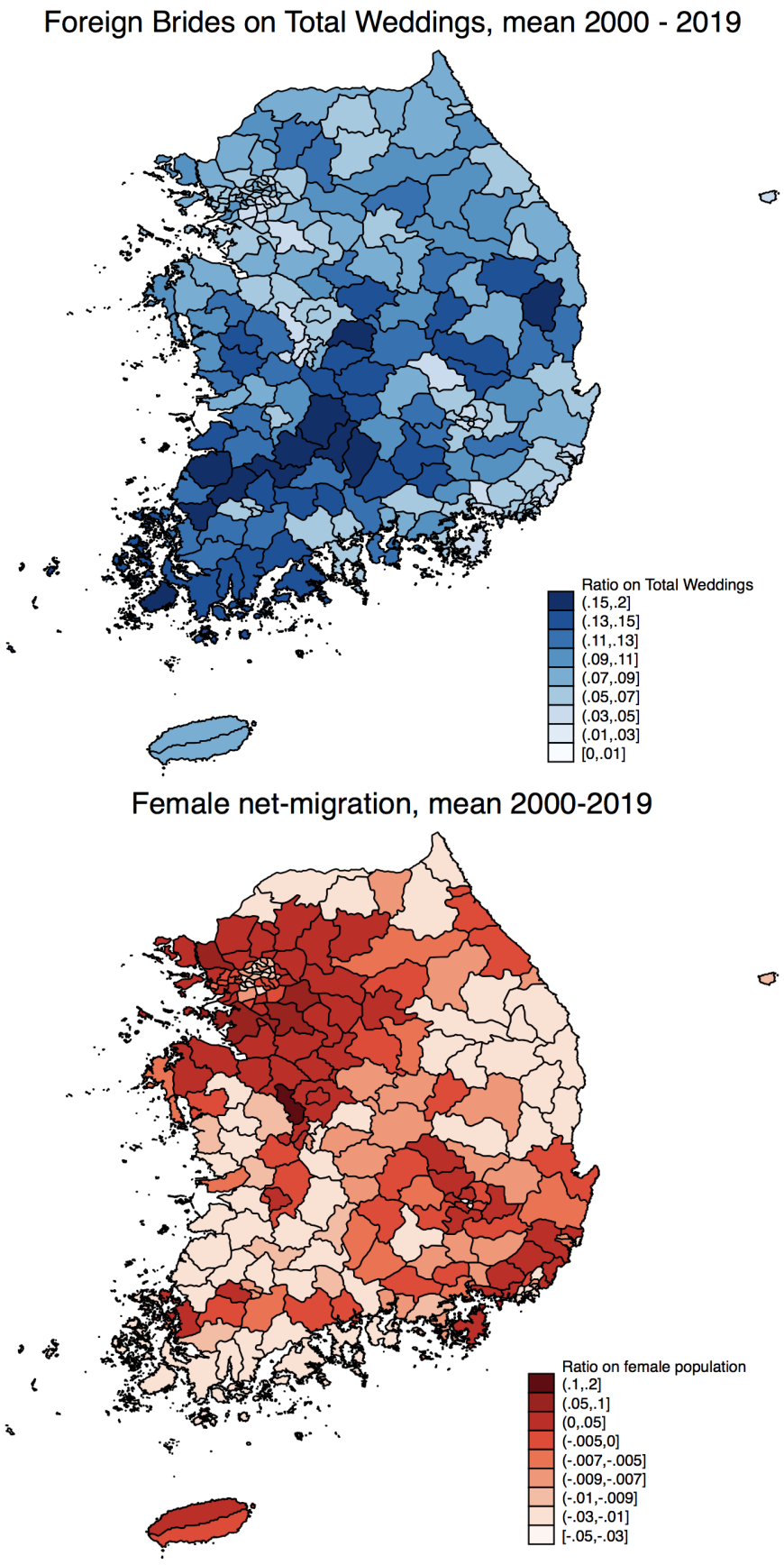

Figure 2: Foreign brides on total weddings and internal female net-migration on total female population

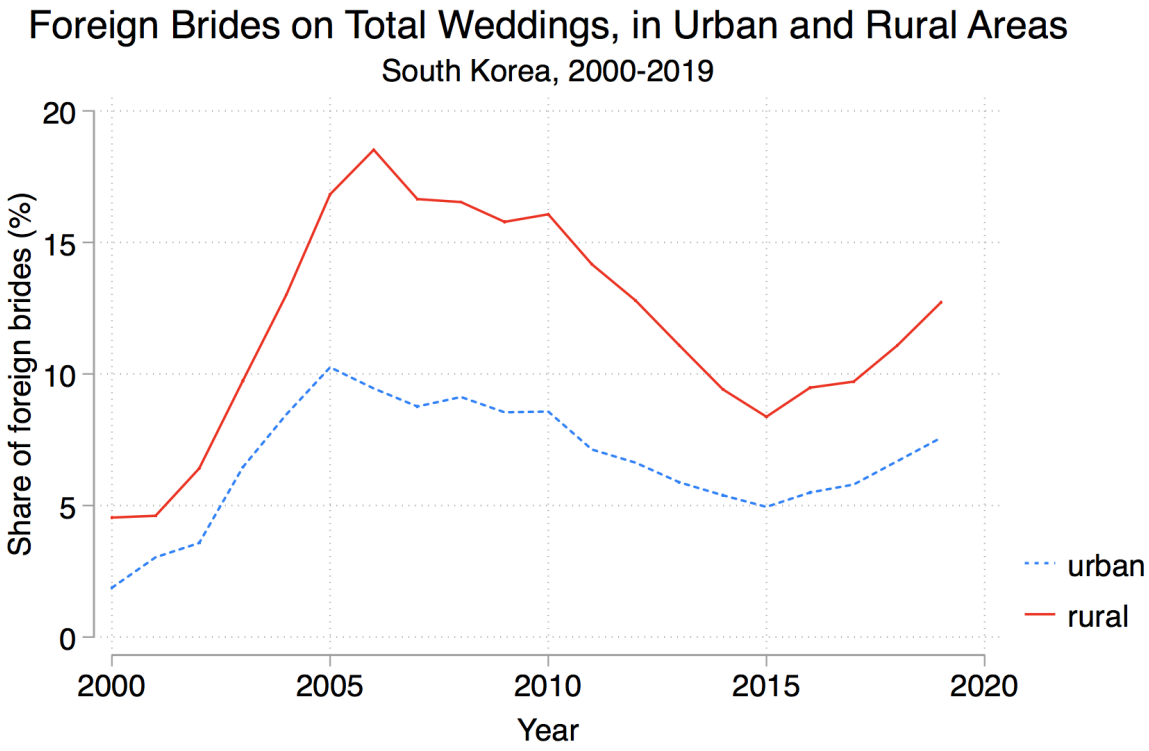

Figure 3: Mean of foreign brides on total weddings by year, overall and by rural/urban areas

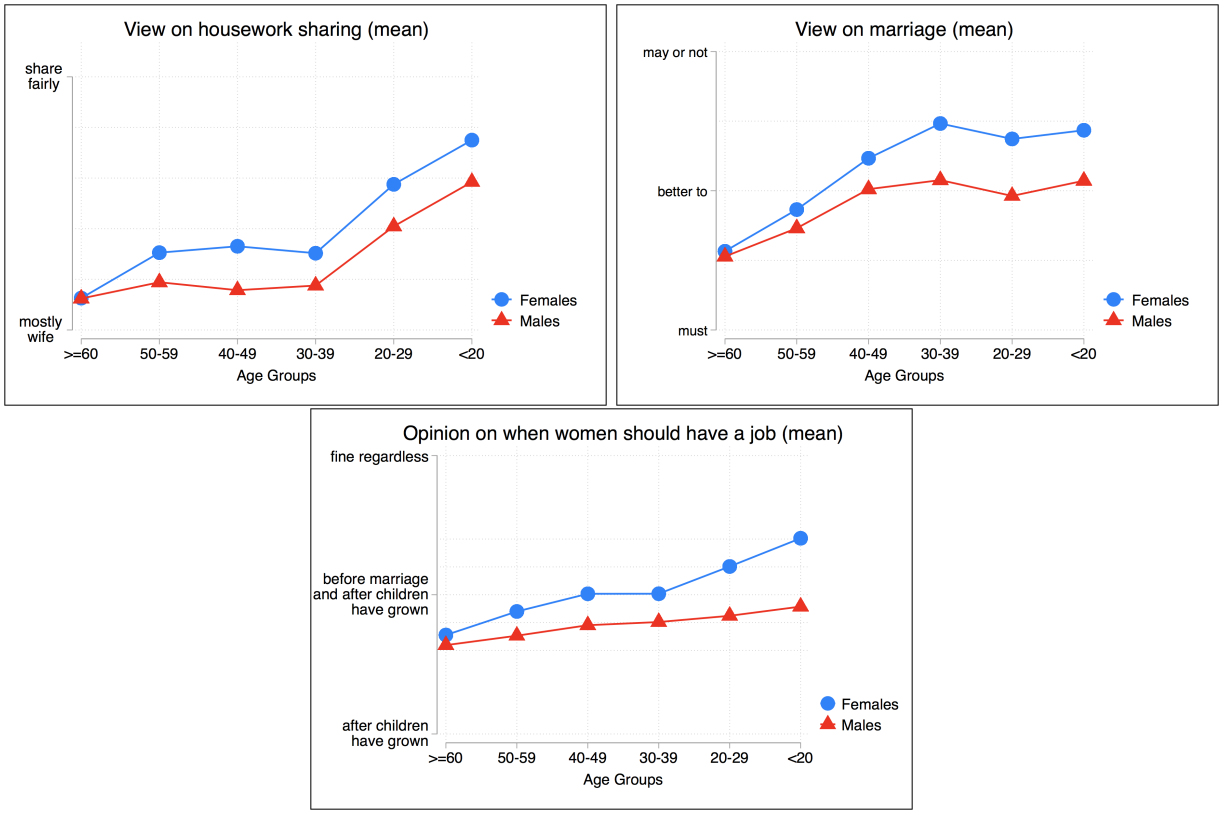

Figure 4: Korean Family, Welfare and Labor Survey, 2002 (South Korea), mean of views on gender roles, by gender and age group.

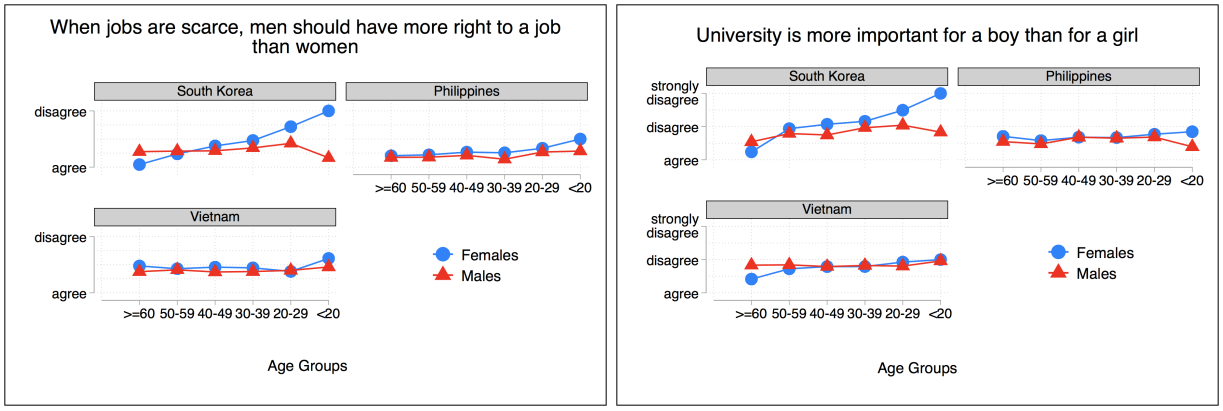

Figure 5: World Value Survey, 2001 (South Korea, Philippines and Vietnam), mean of views on gender roles, by gender and age group.

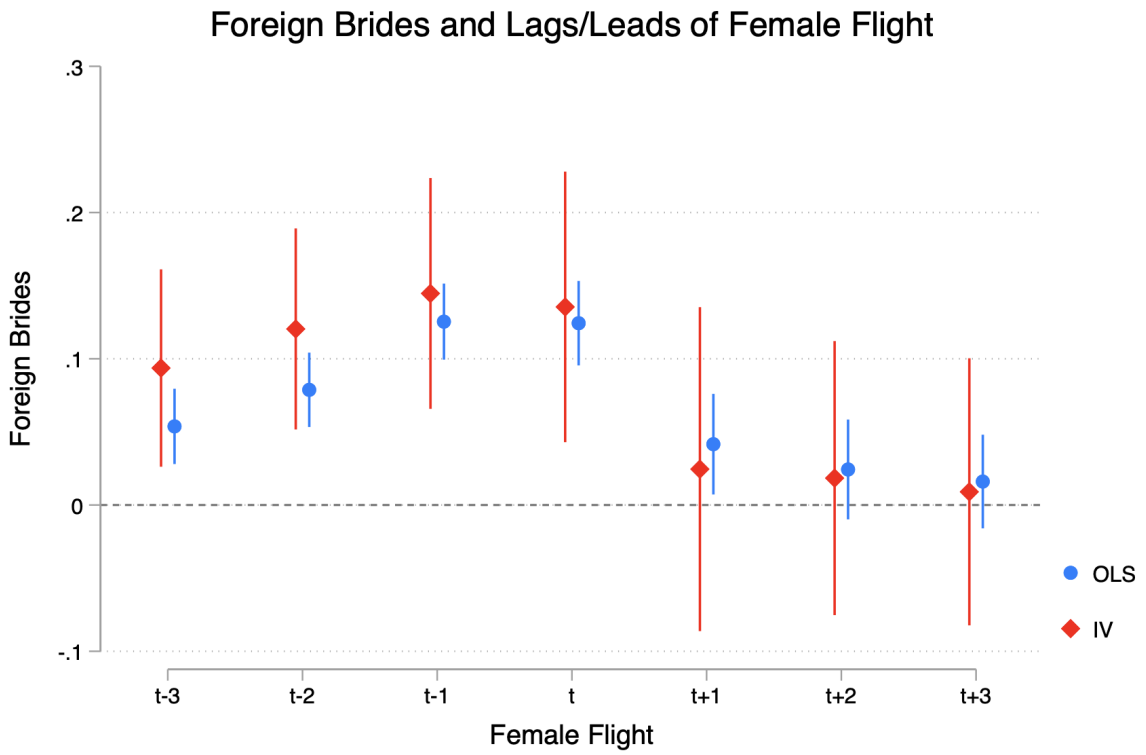

Figure 6: The figure plots the coefficients of the OLS and IV estimates obtained regressing *Foreign brides ratio* on different lags and leads of *Outflows/total migration* of women at age 20-34.

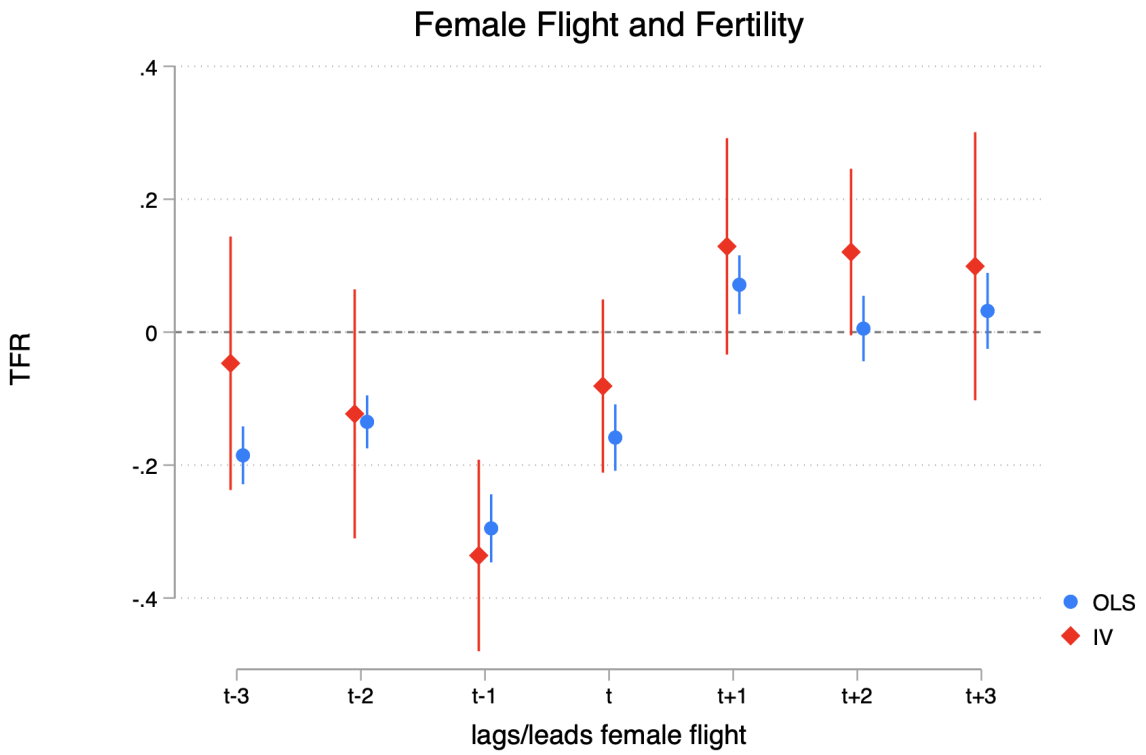

Figure 7: The figure plots the coefficients of the OLS and IV estimates obtained regressing *log(total fertility rate)* on different lags and leads of *log(outflows/total migration)* of women at age 20-34. Estimates are computed at the district level

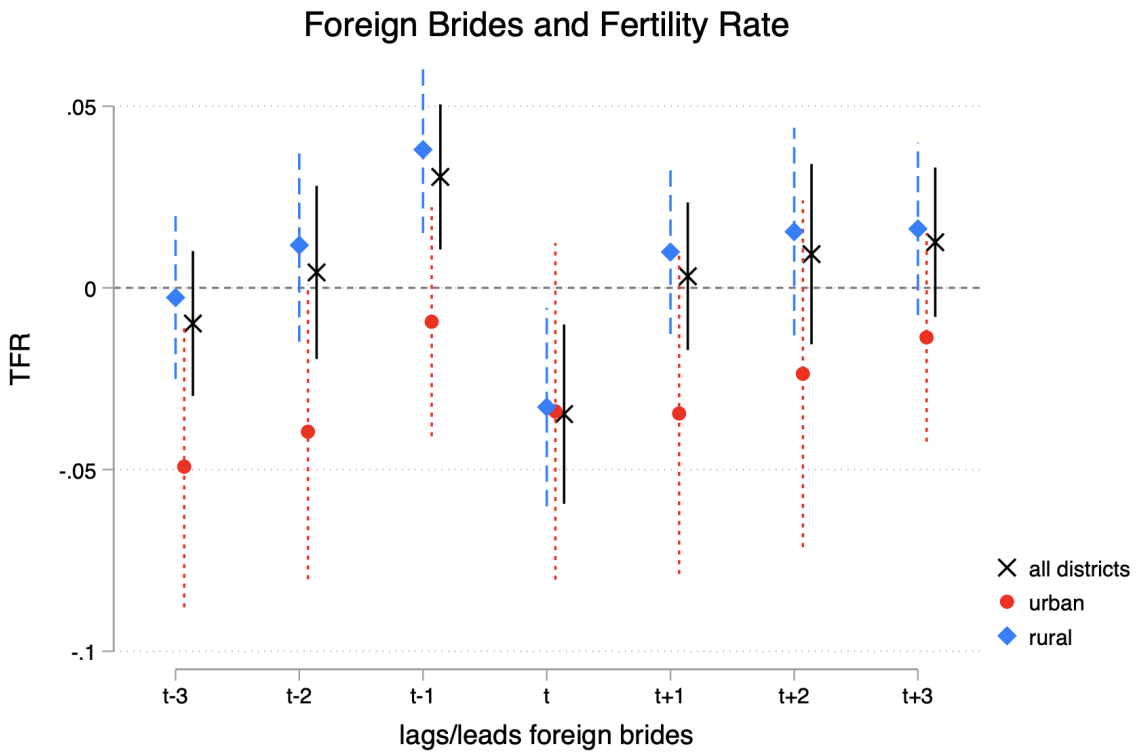

Figure 8: The figure plots the coefficients of the OLS estimates obtained regressing *log(total fertility rate)* on different lags and leads of *log(foreign brides)*. Estimates are computed at the district level

A Internal Migration: Reasons for Moving

Table 6: Internal Movers by Reason (2001-2019)

Reason	*Males (%)*	*Females (%)*	*Total (%)*
Job	46.54	39.02	43.54
Family	15.75	26.29	19.96
Housing	22.50	17.99	20.70
Education	3.44	3.58	3.49
Health	1.36	1.47	1.40
Other	10.05	11.17	10.50
Total	100	100	100

Notes: Internal Migration Census, years 2001-2019. Percentage of internal migrants, by gender and by reason for moving.

B Appendix: Additional Figures

B.1 Year 2002: the change in the type of visa for foreign spouses

Figure1 shows the number of international weddings as a ratio of total weddings. In 2002 there is a sharp increase in this kind of weddings: this is possibly attributable to the spread of international marriage agencies around the country, but it could also be driven by a policy change. Until 2001 foreign spouses obtained the Visiting and Joining Families (F-1) Visas, which did not allow holders to apply for permission to work in South Korea. It is from May 2002 that all foreign spouses could get residence (F-2) visas, which allowed them to work (Lee H. K., 2008). This change in policy is likely to have played as a major pull-factor for a marriage market that is strongly characterized by geographical hypergamy (i.e. women from less developed countries moving to more economically developed ones). Moreover, the ministry of gender equality in 2002 started providing an interpretation service for migrant women who need counseling and shelter for sex trafficking, sexual abuse and domestic violence. The availability of this kind of service offers a sort of security for women who choose to migrate through marriage.

B.2 Foreign brides by brides' nationality, 2000-2019

Figure9 plots the number of foreign brides by country of origin for the period 2000-2019. Until year 2010, the majority of brides originated from China. In 2006 there is a sudden drop in Chinese brides, which results in the sharp drop that we find for year 2006 in Figure1. This drop does could be driven by Chinese-specific factors. For example, Bulte et. al (2011) document that preference for boys is the main driver of unbalanced sex ratio in China, and that the One-Child Policy is responsible for about half of it. Therefore, the One-Child Policy enacted in China in 1980, together with selective abortion due to traditional son-preference, may have led to imbalanced sex ratios and twenty-five years later, to a shortage of women at marriage age that interrupted the outflows of brides to South Korea.

While in 2006 there is a decrease in brides with Chinese nationality, there is a substantial increase in Vietnamese ones. As documented by Ahn (2021), most of Vietnamese brides involved in international weddings used to migrate to Taiwan until 2004, the year in which a visa-tightening policy for foreign brides was enacted and drastically reduced the flow of foreign brides to Taiwan. From that year, Vietnamese women switched destination country from Taiwan to South Korea (Ahn, 2021) and Figure9 shows the rise in Vietnamese brides that contrasts the fall in Chinese ones for 2006.

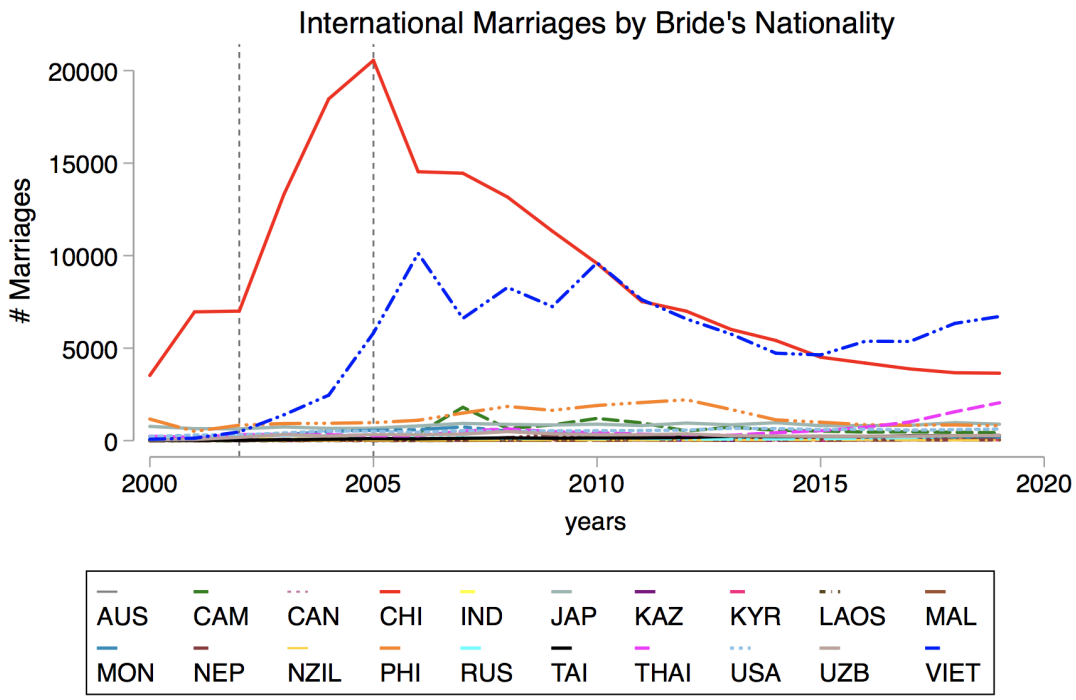

Figure 9: Number of international marriages by brides' country of origin, years 2000-2019 - Korean Statistics Office

B.3 Foreign Brides Ratio and "Female Flight"

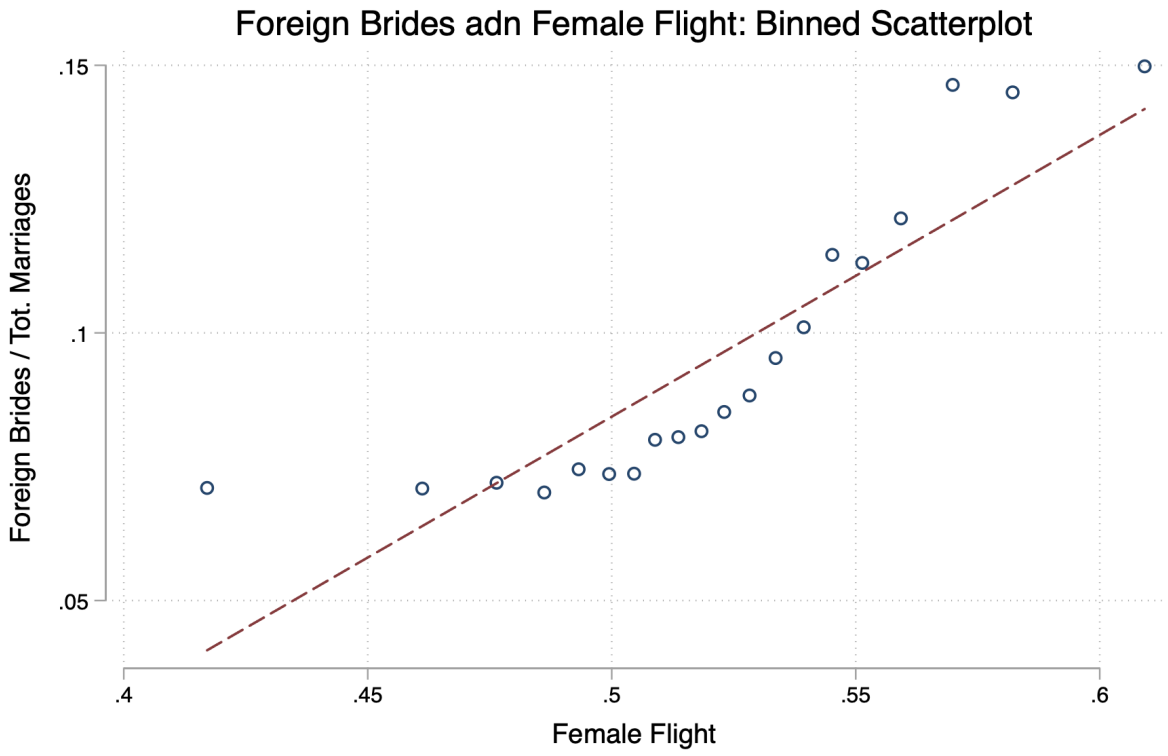

Figure 10: Scatterplot of Foreign Brides Ratio and Outflows/(Inflows+Outflows) of women at marriage age

B.4 Lags and Leads of Female Flight - unique regression

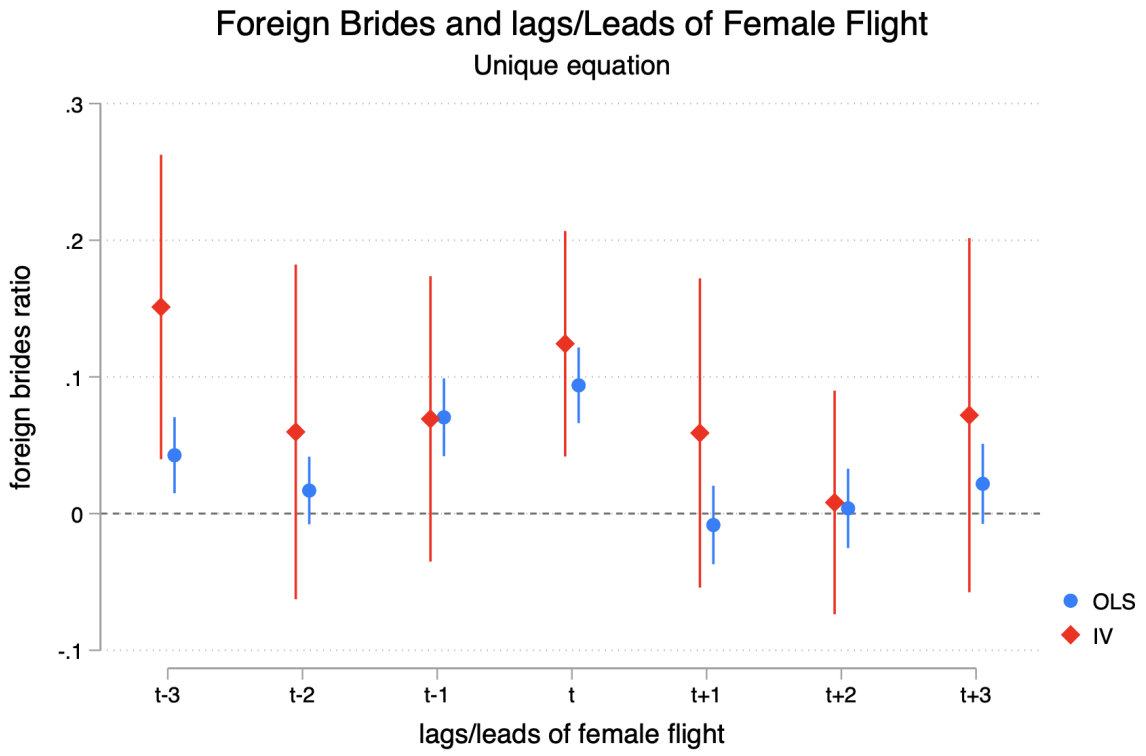

Figure 11: The figure plots the coefficients of the OLS and IV estimates obtained regressing *foreign brides ratio* on different lags and leads of *female flight* of women at age 20-34, in a unique regression.

C Appendix: Robustness Checks

C.1 Different Form of Female Flight

Table 7: Dep. Variable: *Foreign brides ratio*

	All districts			Main Cities - Urban			Provinces - Rural		
	(1) OLS	(2) IV	(3) First stage	(4) OLS	(5) IV	(6) First stage	(7) OLS	(8) IV	(9) First stage
outflows/inflows (t-1)	0.030***	0.045***		0.028***	0.023*		0.031***	0.068**	
	(0.003)	(0.011)		(0.011)	(0.005)		(0.005)	(0.020)	
outflows/inflows IV			1.797***			2.382***			1.422***
			(0.279)			(0.417)			(0.326)
Obs.	3122	3122	3122	1022	1022	1022	2100	2100	2100
Clusters	223	223	223	73	73	73	150	150	150
F-stat			41.35			32.56			18.99

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at the district level in parentheses. The table presents results for a balanced panel of 223 Korean districts, over the period 2005-2019. Column (1) shows OLS estimates, while column (2) shows IV estimates. The dependent variable is the ratio of the number of foreign brides on total weddings. *outflows/inflows* is the ratio between the number of women of age 20-34 who moved out of a district at time t over the number of women of the same age group who moved in that district in the same year. *outflows/inflows* is instrumented using *Predicted Outflows/Predicted Inflows* of women of age 20-34. The instrument is built using the stock internal migrants during the period 2002-2004. Column (3) presents the first stage results, where the dependent variable is outflows/inflows. For columns (4) to (6) I repeat the estimates including only main cities, where district are almost entirely urban. Columns (4) to (6) exclude main cities and only keep provinces, where the variation between urban and rural areas is higher. For all estimates I weight for total population at the district level. The analysis includes district fixed effects and province*year fixed effects.

C.2 Control: Sex Ratio at Marriage Age

Table 8: Main Estimates - *Dep. Variable* = $\frac{foreign\ brides}{total\ weddings}$

	All districts		Main Cities - Urban		Provinces - Rural	
	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV
Fem outflows/tot mig (t-1)	0.125***	0.144***	0.112***	0.093*	0.133***	0.189**
	(0.013)	(0.040)	(0.015)	(0.041)	(0.019)	(0.070)
log(sex ratio)	0.007*	0.007*	-0.003	-0.004	0.008*	0.007*
	(0.003)	(0.003)	(0.024)	(0.024)	(0.003)	(0.003)
Obs.	3122	3122	1022	1022	2100	2100
Clusters	223	223	73	73	150	150

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at the district level in parentheses. The table presents results for a balanced panel of 223 Korean districts, over the period 2005-2019. Column (1) shows OLS estimates, while column (2) shows IV estimates. The dependent variable is the ratio between the number of foreign brides and total new weddings. *Fem outflows/tot mig* is the the number of women of age 20-34 who moved out of a district at time t over the total number of women of the same age group who moved in or out that district in the same year. I control for district's sex ratio at marriage age, i.e. the ratio between the number of men over the number of women who are eligible in the marriage market. *Fem outflows/tot mig* is instrumented using *Fem outflows/tot mig IV* of women of age 20-34. The instrument is predicted using the stock of women flows at age 20-34, during the period 2002-2004. For columns (3) and (4) I repeat the estimates including only main cities, where districts are almost entirely urbanized. For columns (5) and (6) I repeat the estimates excluding main cities and keeping only provinces, where the heterogeneity of urban and rural areas is higher. For all estimates I weight for total population at the district level. The analysis includes district fixed effects and province*year fixed effects.

C.3 Control: Male Migration

Table 9: Main Estimates and First Stage - *Dep. Variable* = $\frac{foreign\ brides}{total\ weddings}$

	All districts		Main Cities - Urban		Provinces - Rural	
	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV
Fem outflows/tot mig (t-1)	0.159***	0.304	0.180*	0.183	0.153**	0.361
	(0.041)	(0.225)	(0.071)	(0.169)	(0.049)	(0.433)
Male outflows/tot mig (t-1)	-0.036	-0.168	-0.073	-0.094	-0.021	-0.181
	(0.042)	(0.240)	(0.072)	(0.162)	(0.051)	(0.469)
Obs.	3122	3122	1022	1022	2100	2100
Clusters	223	223	73	73	150	150
F-stat F		17.92		14.97		9.59

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at the district level in parentheses. The table presents results for a balanced panel of 223 Korean districts, over the period 2005-2019. Column (1) shows OLS estimates, while column (2) shows IV estimates. The dependent variable is the ratio of the number of foreign brides on total new weddings. *Fem outflows/tot mig* is the fraction of women aged 20-34 who moved out of a district at time t over the total number of migrant women of the same age group who moved in or out that district in the same year. *Fem outflows/tot mig* is instrumented using *Fem outflows/tot mig IV*, based on past internal migration. *Male outflows/tot mig* is the fraction of men aged 25-39 who moved out of a district at time t over the total number of migrant men of the same age group who moved in or out that district in the same year. *Male outflows/tot mig* is instrumented using *Male outflows/tot mig IV*, based on past internal migration. The instruments are built using the stock of internal migrants during the period 2002-2004. For columns (3) and (4) I repeat the estimates including only main cities, where districts are almost entirely urbanized. For columns (5) and (6) I repeat the estimates excluding main cities and keeping only provinces, where the heterogeneity of urban and rural areas is higher. For all estimates I weight for total population at the district level. The analysis includes district fixed effects and province-by-year fixed effects.

C.4 Robustness Checks for the Shift-Share IV

The five districts which have the largest power in explaining variation of inflows in years 2002-2004 are: Suwon-si (Gyeonggy-do), Seongnam-si (Gyeonggi-do), Gwanak-gu (Seoul), Gangnam-gu (Seoul), Goyang-si (Gyeonggi-do) for inflows. The five districts with the largest power in explaining variation of outflows are: Suwon-si (Gyeonggi-do), Gangnam-gu (Seoul), Gwanak-gu (Seoul), Seongnam-si (Gyeonggi-do), Songpa-gu (Seoul). Table10 presents these districts and their related weights. We can see that for inflows, the five districts with highest weights explain about 8 percent of the total variation for building the instrument. For outflows, the five districts explain about 10 percent of the total variation. Table11 shows that the 2SLS estimate results are robust when excluding internal migrants coming from or moving to these districts.

Table 10: Rotemberg Weights

district Name	**Weight**
Panel A: Inflows	
Suwon-si (Gyeonggi-do)	0.0172
Seongnam-si (Gyeonggi-do)	0.0168
Gwanak-gu (Seoul)	0.0166
Gangnam-gu (Seoul)	0.0160
Goyang-si (Seoul)	0.0150
Panel B: Outflows	
Suwon-si (Gyeonggi-do)	0.0243
Gangnam-gu (Seoul)	0.0217
Gwanak-gu (Seoul)	0.0203
Seongnam-si (Gyeonggi-do)	0.0197
Songpa-gu (Seoul)	0.0189

Notes: the table presents the weights of the five districts that have the highest power in in generating the identifying variation of the instrument. In particular, Panel A presents the five districts and the respective Rotemberg Weights which have the largest power in explaining variation for predicted inflows. Panel B presents districts and their related weights for predicted outflows. These weights refer to the stock of women who migrated internally during the period 2002-2004, used to build the Enclave instrument used for the analysis.

Table 11: IV robustness check with Rotemberg Weights

	(1) baseline	(2) check 1	(3) check 2	(4) check 3	(5) check 4	(6) check 5
Log(outflows/inflows) (t-1)	0.440***	0.406**	0.448***	0.441***	0.434***	0.483***
	(0.119)	(0.143)	(0.114)	(0.119)	(0.122)	(0.120)
Obs.	3122	3108	3094	3108	3094	3094
Clusters	223	222	221	222	221	221
F-stat	22.43	43.99	22.28	22.40	21.02	22.54

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at the district level in parentheses. The table presents results of robustness checks for the instrument. Following Goldsmith-Pinkham et al. (2020), columns (2) to (6) present 2SLS results obtained by excluding districts which have the largest weights in generating the identifying variation of the Enclave instrument. In particular, for column (2), the instrument was built excluding Suwon-si (Gyeonggi-do) for both predicted inflows and predicted outflows. For column (3), Seongnam-si (Gyeonggi-do) was excluded to build predicted inflows and Gangnam-gu (Seoul) was excluded for predicted outflows. In column (4), Gwanak-gu (Seoul) was excluded for both inflows and outflows. In column (5) Gangnam-gu (Seoul) was excluded to build inflows and Seongnam-si (Gyeonggi-do) was excluded to build outflows. Finally, for column (6) Goyang-si (Gyeonggi-do) was excluded for inflows and Songpa-gu (Seoul) for outflows. Column (1) presents baseline 2SLS results, for comparison.

D Appendix: Marriage Age

In order to capture the effect of gender internal migration on the immigration of foreign brides, I concentrate on internal migration at marriage age. If female internal migration induces men to search for foreign brides, migration of women at marriage age would probably have the strongest impact. Therefore, I keep only internal migration of women who belong to marriage age cohorts. According to the Korean Statistics Office (KOSIS), mean age at first marriage for Korean men and women increased respectively from 29,3 and 26,5 in 2000 to 33,4 to and 30,5 in 2019. Figure**??** shows the distribution of age at first marriage for the period 2000-2019.

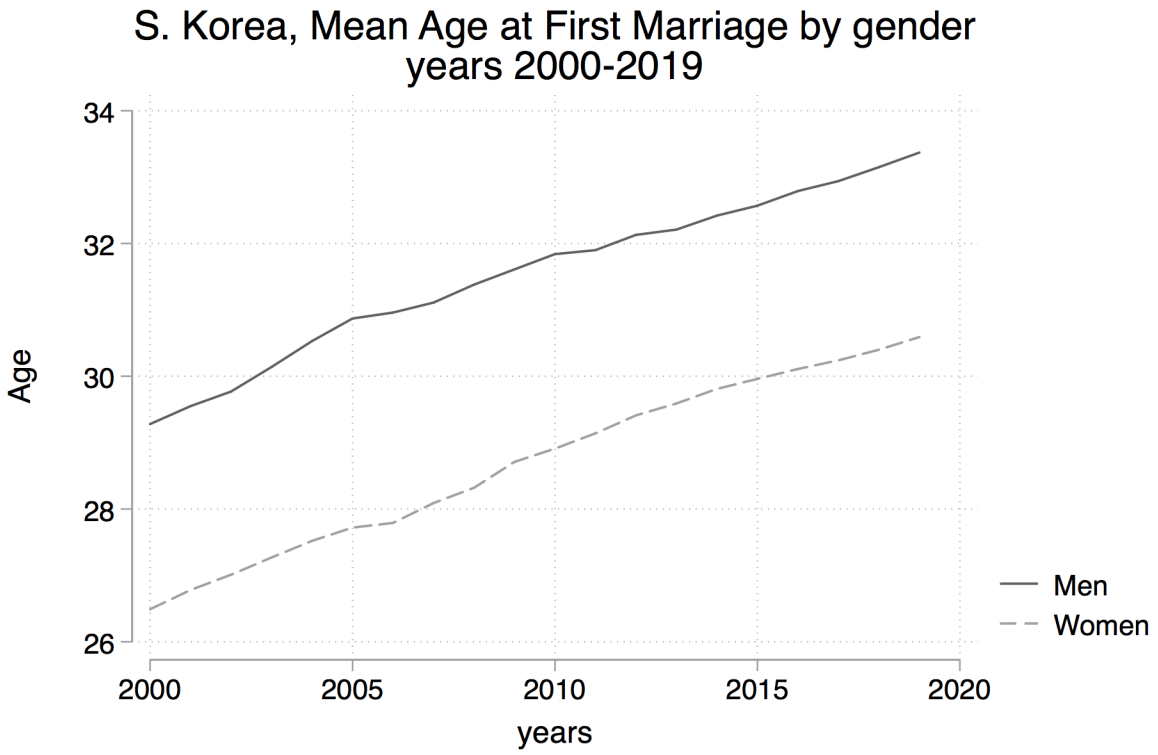

Figure 12: Mean age at first marriage by gender, period 2000-2019

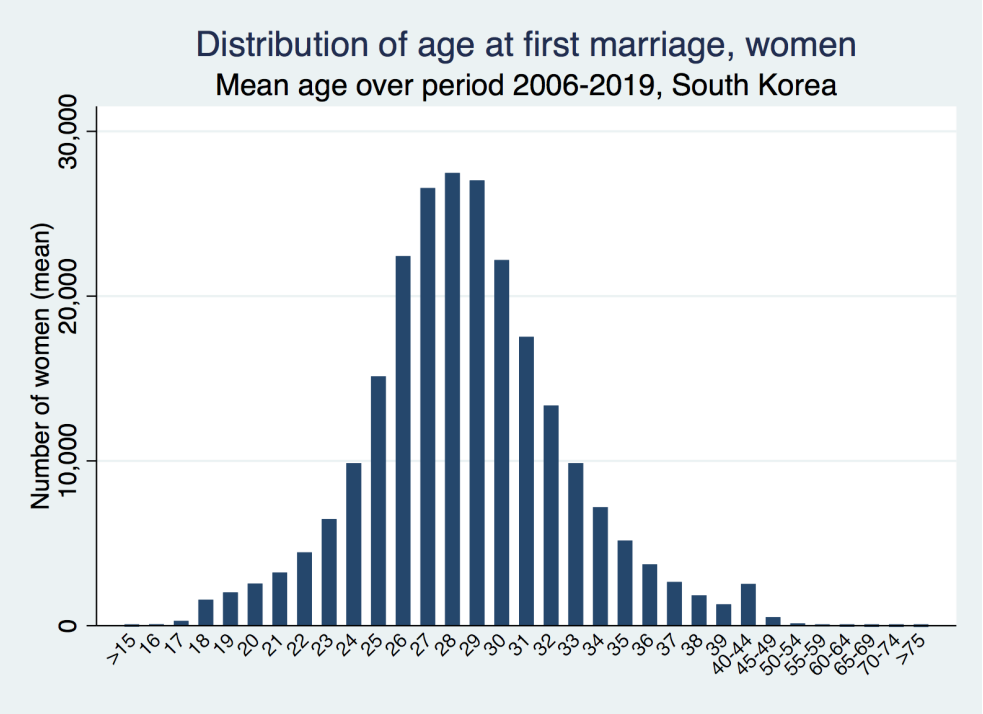

Figure 13: Age distribution at first marriage, mean for period 2000-2019

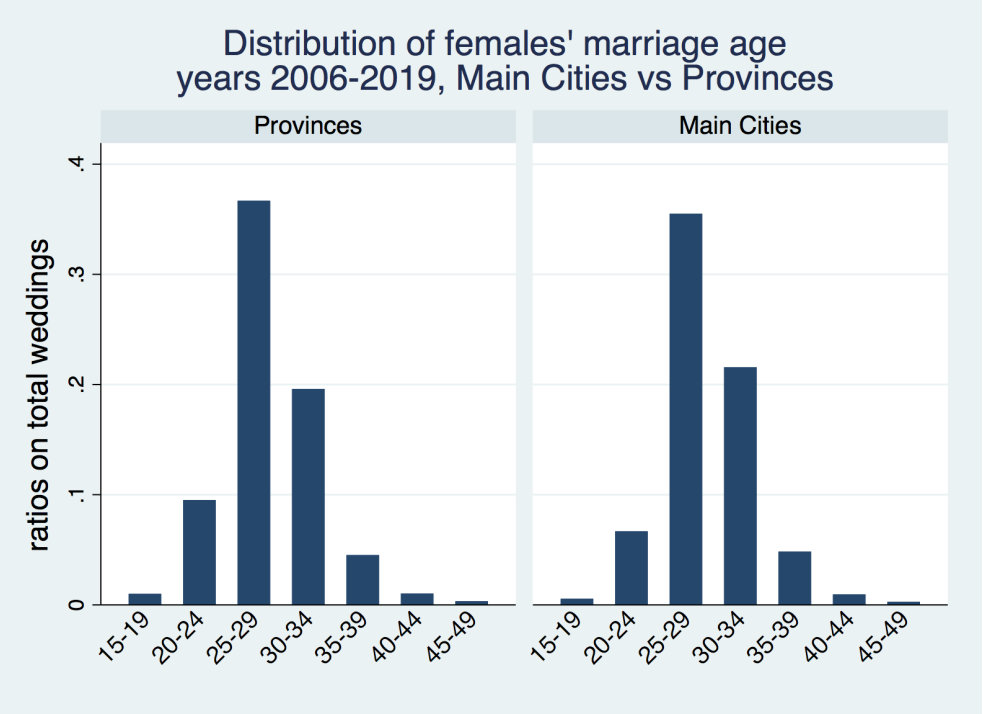

Figure 14: Age distribution for females, by main cities and provinces

E Appendix: The inauguration of KTX (Korean Train Express)

As argued by Jaeger et. al (2018), the validity of the shift-share instrument requires that one of two conditions holds: either the national shifts are not serially correlated, or the variable of interest does not trigger dynamic adjustments in outcomes.

In 2004 the fast train line was inaugurated in South Korea, improving connections between remote places and therefore changing the following patterns of internal migration. This national shock, by changing the patterns of internal migration, reduces the possibility of serial correlation between the two periods of internal migration, which would threaten the exclusion restriction and thus affect the validity of the instrument. The Korean Train Express (from now KTX) is a heavy rail public transit (or transport) with speeds between 200 kmh (125 mph) and 300 kmh (187 mph). Korea inaugurated the KTX services on the Seoul–Busan and Seoul–Mokpo lines on April 1, 2004, becoming the fifth country to run HSR, following Japan, France, Germany and Spain (Shin, D.C., 2005). HSR is convenient to travelers, as it usually connects one city center to another, reducing travel times consistently. The inauguration of the Korean Train Express (KTX) in 2004 is likely to have changed the internal migration patters, alleviating the concerns on the exogeneity of the instrument.

Figure15 plots the mean of net-migration (i.e. he difference between inflows and outflows) of women at marriage age during the period 2000-2019. From the figure we can see that migration trends change and even invert over the two genders after the year 2004. This change in the trends of internal migration, attributable to the inauguration of the fast train line, suggests that the possibility for serial correlation between the instrument and the endogenous variable can be ruled out.

In addition, the figure depicts out-migration in an average rural district, which is always positive and confirming that rural districts are primarily facing out-migration.

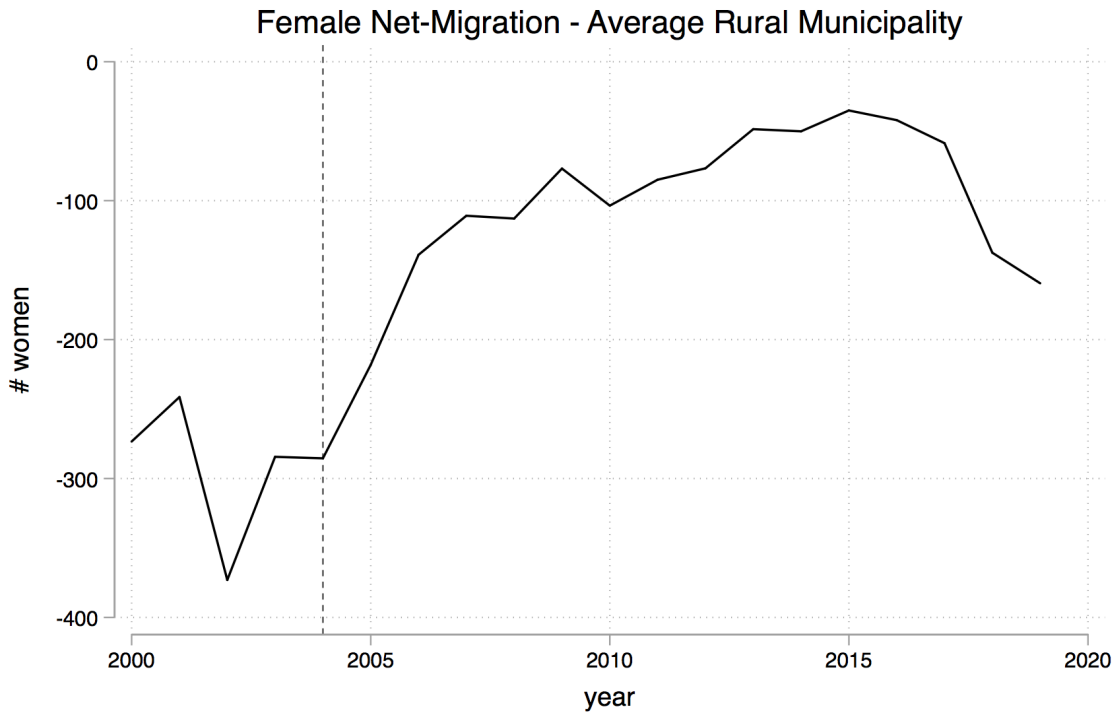

Figure 15: Mean at the district level of internal female net-migration at marriage age for an average rural district in South Korea, during the period 2000-2019.

F Appendix: Fertility Rates, Female Flight and Foreign Brides

I regress districts' total fertility rate (TFR) on both *female flight* and the number of foreign brides. In a unique equation, I use different lags and leads of both *female flight* and the number of foreign brides in district c:

$$TFR_{c,t} = \sum_{t-3}^{t+3} \beta_1 female\ flight_{c,t} + \sum_{t-3}^{t+3} \beta_2 F\ Brides_{c,t} + \delta_c + \theta_{t*p} + \epsilon_{c,t} \tag{11}$$

Where $TFR_{c,t}$ is total fertility rate of district c in year t, $female\ flight)_{c,t}$ is the ratio of outflows over total internal migration of women at marriage age in district c, for year t. $F\ Brides_{c,t}$ is the fraction of marriages between local men and foreign brides over total new marriages for district c in year t. All years included for both regressors are within three years before and three years after t. δ_c and θ_{t*p} are district fixed effects and province-by-year fixed effects; $\epsilon_{c,t}$ is the error term.

I regress a district's fertility rates on both *female flight* and the number of foreign brides, instrumenting *female flight* with the enclave IV.

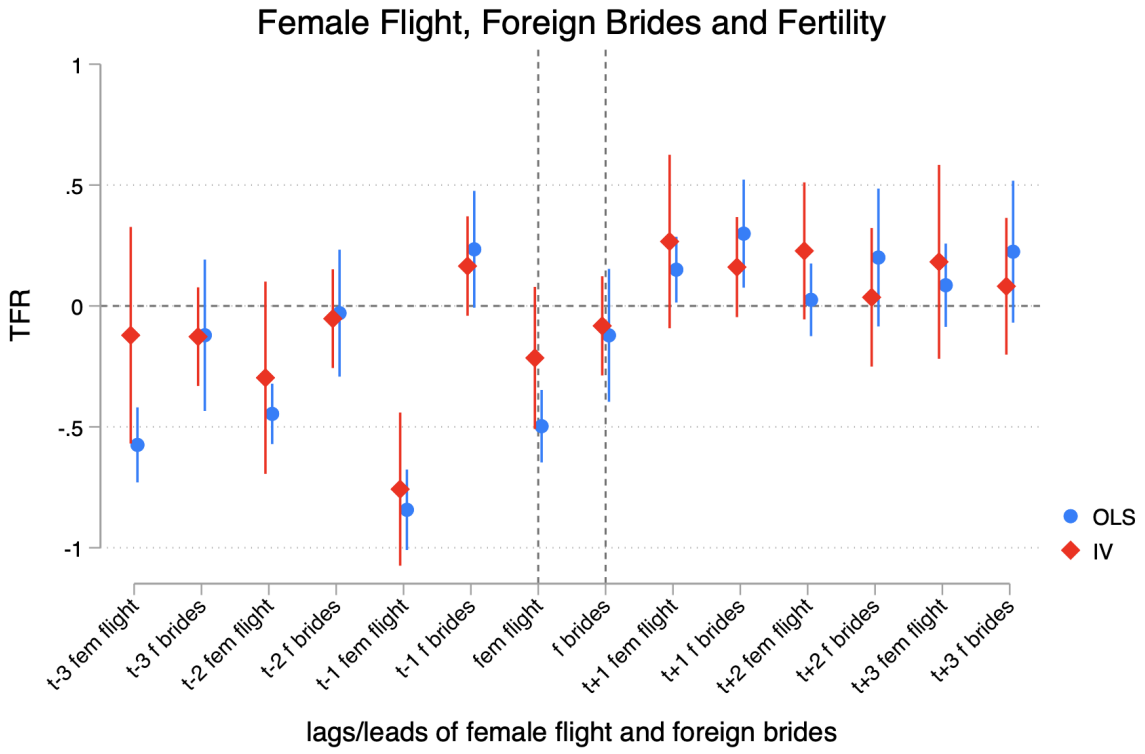

Figure 16: The figure plots the coefficients of the OLS estimates obtained regressing Total Fertility Rate on different time-lapse of both *female flight* and *foreign brides ratio*. Estimates are computed at the district level

G Vital Statistics: South Korea, 1990-2019

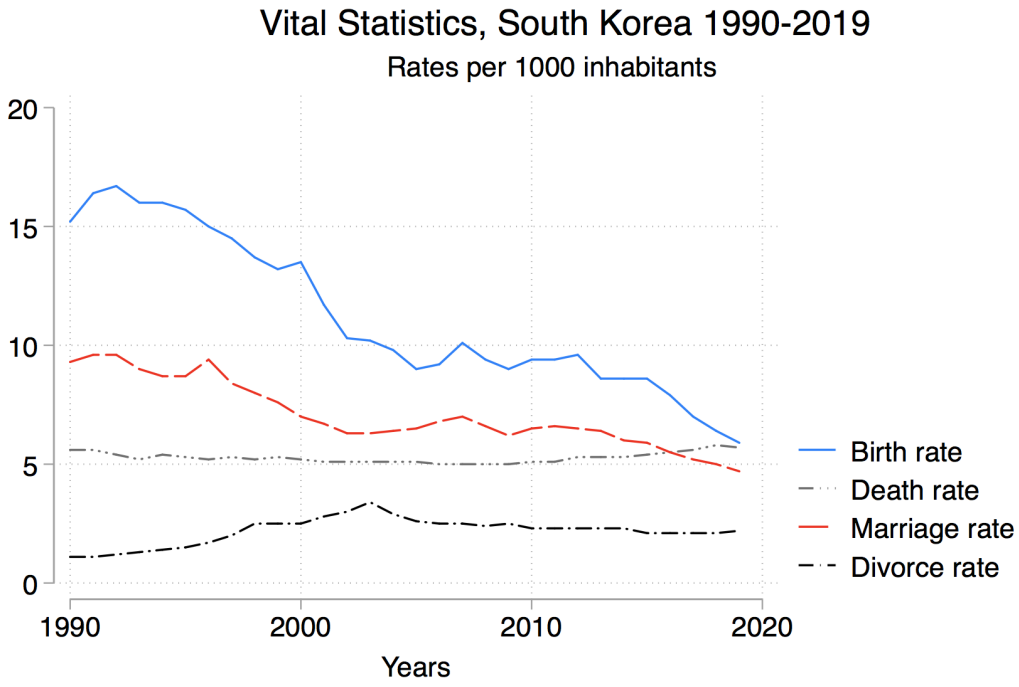

Figure 17: Vital Statistics (1990-2019) - Korean Statistics Office: crude birth rate, crude death rate, crude marriage rate and crude divorce rate.

H Appendix: Korean Family, Welfare and Labor Survey, 2002

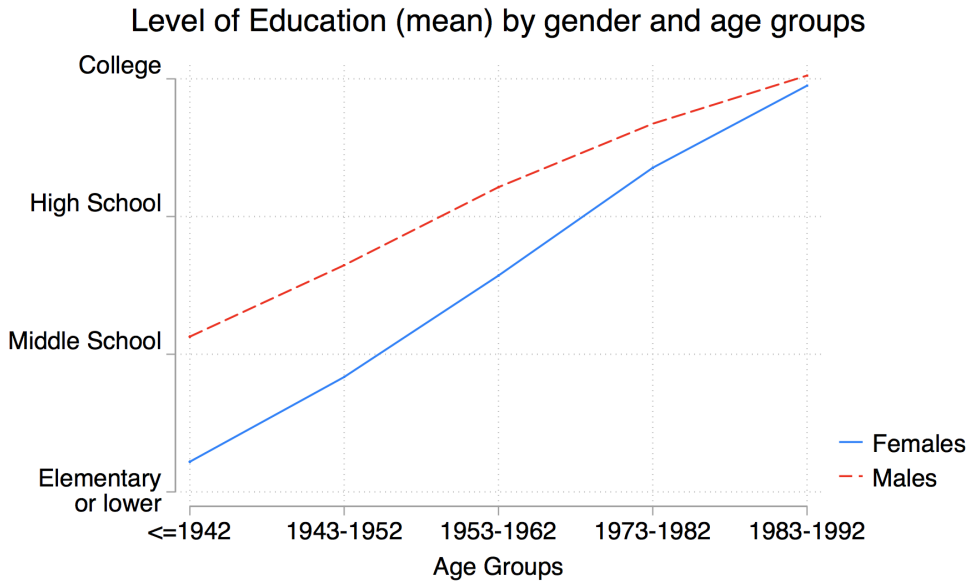

Figure 18: Education by age groups and gender, Korean Family, Welfare and Labor Survey 2002

I Appendix: Descriptive Statistics of marriage migrants by gender

Multicultural Family Survey, 2012

Table 12: Age of marriage migrants by gender

	N	Percent	Age (mean)	SD age	Min age	Max age
Males	2304	15.75	36.026	10.914	15	85
Females	12324	84.25	44.067	11.295	21	89
Total	14628	100	37.293	11.358	15	89

Notes: Multicultural Family Survey, 2012 - statistics on age of marriage migrants by gender.

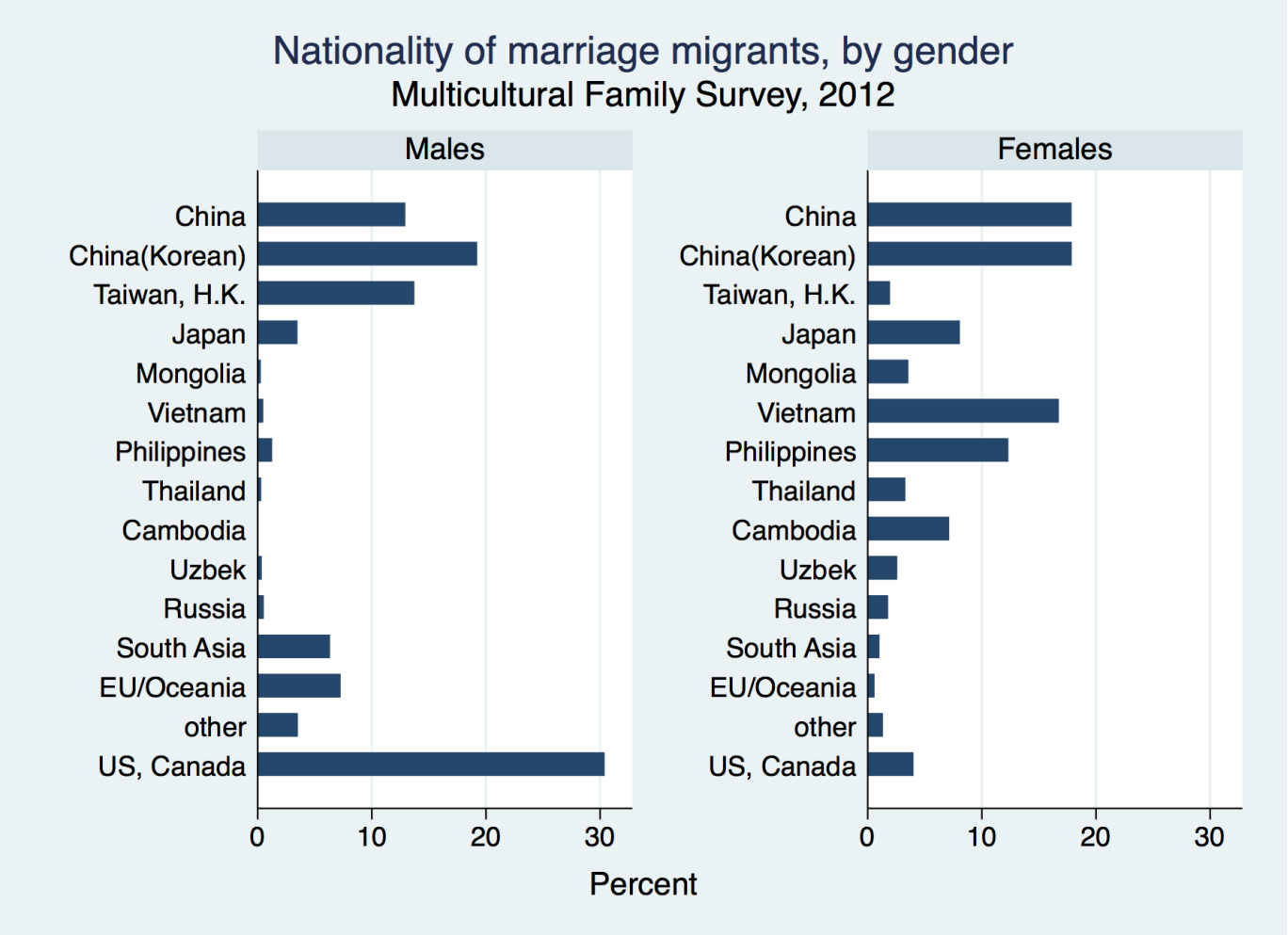

Figure 19: Shares of foreign brides by country of origin - Multicultural Family Survey 2012