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Brides for sale: Cross-border marriages and female immigration

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Brides for Sale: Cross-Border Marriages and Female Immigration

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Forschungsinstitut
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Institute for the Study
of Labor

Brides for Sale: Cross-Border Marriages and Female Immigration

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ABSTRACT

Brides for Sale: Cross-Border Marriages and Female Immigration*

Every year, a large number of women immigrate as brides from developing countries to developed countries in East Asia. This phenomenon virtually did not exist in the early 1990s, but foreign brides currently comprise 4 to 35 percent of newlyweds in these developed Asian countries. This paper argues that two factors account for this rapid increase in "bride importation": the rapid growth of women's educational attainment and a cultural norm that leads to a low net surplus of marriage for educated women. We provide empirical evidence supporting our theoretical model and its implications, using datasets from Japan, Korea, Singapore, and Taiwan.

JEL Classification: A12, J12, J61

Keywords: immigration, marriage, sex ratio imbalance, international marriages, cross-border marriages, assortative matching

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1 Introduction

Every year, a large number of women immigrate to developed countries in East Asia as brides. This phenomenon virtually did not exist in the early 1990s, but foreign brides currently comprise 4 to 35 percent of newlyweds in Japan, South Korea (hereafter Korea), Singapore, and Taiwan.[1] A large fraction of these foreign brides immigrate to a country because of marriage, not because they immigrated first and met their grooms in that country. They generally have different ethnicities from their groom's and have a limited proficiency of the language used in the country to which they have immigrated. Given the ongoing time trend of sizable marriage immigration and immigrants' demographic characteristics, each of these East Asian countries have given immense attention to the marriage immigration issue by adjusting immigration laws, introducing social programs for the smooth assimilation of marriage immigrants, and designing policies to mitigate discrimination against marriage immigrants and mixed-ethnic children resulting from these cross-border marriages (see overviews at Yang and Lu (2010) and various media reports, including the *New York Times* (2007, 2012)).

A puzzle behind this Asian marriage immigration is that these developed East Asian countries appear to prefer clearing their marriage market by themselves to "importing" brides from other countries, and they could do so considering stable raw sex ratios during this time period. For example, native men who have a foreign bride often report that they would prefer a native to a foreigner as a wife. Coincident with a large influx of foreign brides, many native women, particularly those who are educated, remain single; such women reportedly search for a spouse among natives but cannot find a suitable match.[2]

What then may account for this large-scale marriage immigration in East Asia? This paper explains this marriage immigration by emphasizing the rapid improvement of women's labor-market opportunities in East Asia, together with an imperfect adjustment in

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[1] In Hong Kong, only less than 2 percent of HK grooms married brides from China in1991, but the figure rapidly grew in the 2000s and reached 39 percent in 2005. Although we consider these brides from China as marriage immigrants, we do not include Hong Kong in our analysis because of data limitations. For example, we could not access datasets informing us about marriage immigrants from countries other than China.

[2] This phenomenon has received much attention from the media around the world, policy makers, and researchers. Examples include the lead article "Asia's Lonely Hearts" in *The Economist* (August 20-26, 2011), as well as Lee (2008), Park and Choi (2008), Sato (1988), and Wang and Chang (2002).

institutions that affects an individual's net gains from marriage. For simplicity, suppose that natives prefer marrying one another to remaining single or marrying a foreigner. If an East Asian marriage market clears according to a standard marriage model following Becker (1973), then net gains from marriage will be adjusted through transfers between men and women according to the increase of women's outside option resulting from improvement in their labor-market opportunities. Therefore, there will be no inefficient marriage market equilibrium, which East Asian countries appear to have, as described above. Alternatively, suppose that the allocation rule of net gains from marriage, which we refer to as "cultural norms" hereafter, does not change as fast as marriage-market conditions. For example, if a woman's net gains from marriage remain the same despite the increase in her outside option, she may remain single because she cannot find a "good match." Under this setting, the rapid improvement of women's outside option, together with slow adjustment in cultural norms, implies that women with a high outside option may remain single, resulting in an effective sex-ratio imbalance, and that consequently some men, particularly those who are least preferred by women, may not find a spouse among native women and thus may turn to a foreign country to search for a wife.

Why would cultural norms not be adjusted appropriately to domestically clear the marriage market? A possible explanation could be the difficulty in coordinating multiple cohorts. For example, a woman's net gains from marriage may depend not only on her spouse but also on other individuals connected to be because of marriage, such as her parents-in-law. It is possible that her future husband may be willing to do home production to give her larger gains from marriage, but her parents-in-law may not accept having their son conducting tasks done only by women in their own cohort. Another related explanation could be a limited commitment problem (see Lundberg and Pollak (2007) for a discussion on the role of limited commitment in marriage). In the example above, the woman may reject a marriage even if her future husband agrees to engage in home production with approval from his parents. This is because in a real marriage market, it is not possible to write a binding contract that compels the man to engage in home production after marriage. If the woman expects a high probability that the man would end up behaving like her father who did not participate in home production, then she would not accept the marriage with him unless he can provide her sufficient net gains from marriage without participating in

home production. This latter example may account for the fact that in these developed East Asian countries, educated women do not commonly choose "marrying-down," that is, having a less-educated husband, as compared to remaining single.

We model the story sketched above in a simple two-sided matching framework. To incorporate the idea of an imperfect adjustment in cultural norms, we use a non-transferability utility model, where an individual's socioeconomic status and payoff from marrying a certain type of person are exogenously determined (see related discussion in Smith (2006)). In our model, a man is referred to as "modern" if he suffers less from participating in home production than the rest of men, called "traditional." We define a woman as modern if she has higher utility from remaining single relative to the rest of women, who are called traditional. In our model, traditional men prefer modern women among native women the least, whereas modern women prefer remaining single to marrying a native man with low socioeconomic status. A key implication of our model is that even if two countries have the same distribution of education and balanced raw sex ratios, only one country, not two, may need to import brides from outside if the number of modern men relative to modern women is small in one country (e.g., developed East Asian countries) but large in the other (e.g., the United States). Thus, in our model, cultural norms are accounted for by the amounts of modern men relative to those of modern women in a marriage market. Similarly, if the number of modern women increases rapidly (because of gender equality in education, for example), then the fraction of those who are single among native women and the fraction of native men marrying a foreigner increase unless cultural norms can change sufficiently. We provide empirical patterns consistent with our model assumptions and several model implications by analyzing macro- and micro-level datasets from Japan, Korea, Singapore, and Taiwan.

By studying marriage markets in developed East Asian countries, this paper shows that the (effective) sex-ratio imbalance in a country can be transmitted to another country through marriage immigration, which can substantially change socioeconomic environments in both countries. This then raises the question of how a native groom decides from where to "import" his bride. We empirically examine this question in two ways. First, we examine an aggregate-level decision of selecting a trading partner for brides across the world. Estimating a gravity model, we find that a country's income relative to

the destination country, geographical distance, and its trade volumes with the destination country account for over one quarter of the data variations observed in the data. Second, we use a micro-level analysis to examine whether there is any systematic difference in grooms' characteristics depending on their brides' nationalities. We interestingly find positive sorting along occupation. For example, all else being equal, a Korean farmer is more likely to have a Vietnamese bride, who is more likely to have experience in farming production than a Chinese or Filipino bride.

Another question that has important policy implications is whether a female marriage immigrant is positively or negatively selected in terms of human capital. By examining the census data of the home countries of female marriage immigrants, we find that these brides are more educated than their counterparts in their home country and overseas female workers from their countries.

Although the literature on marriage immigration is quite new to economics,[3] sociologists and policy-oriented research institutions have studied the prevalence and potential determinants of foreign brides and conducted interviews to examine who married a foreign wife and why (for reviews, Yang and Lu (2010)). This paper differs from these existing studies in several dimensions. We provide a simple yet unified theoretical framework to explain the increase in the number of foreign brides, female educational attainment, and extent of singlehood, particularly among educated women. Second, we analyze common empirical patterns across multiple developed East Asian countries, instead of providing a case study. Finally, several analyses in our paper such as examining a groom's choice for his bride's nationality and bride's human capital relative to her peers in her home country is new to the literature.

As for studies in economics, this paper integrates three literatures. The first is the rich literature on marriage. Following a pioneering work by Becker (1973), many researchers have conducted theoretical and empirical studies of the clearing mechanisms in

[3] The recent economics literature on marriage immigration per se includes Nielsen et al.'s (2009) analysis of the impact of a Danish policy change that bans an immigrant from bringing a spouse from his/her home country on immigrants' educational attainment. Nicely summarized in their work, many non-Western immigrants in Scandinavia choose their spouses from their country of origin and bring them to their country of residence. The marriage immigration in East Asia that we study is different from that in Scandinavian countries in two respects. One is that natives, instead of immigrants, bring a spouse from a foreign country; the other is that almost all marriage immigrants in East Asia are women, whereas a significant fraction of marriage immigrants are men in Scandinavia.

marriage markets and agents' underlying preferences (for a review, see Weiss (2000)). In particular, our paper is related to studies on sex-ratio imbalance and its consequences in marriage markets (e.g., Abramitzky et al. (2011), Angrist (2002), Edlund (1999), Foster and Rosenzweig (2001), Lafortune (2011), Wei and Zhang (2011)). Our paper contributes to these studies by suggesting that the gender-gap reduction in socioeconomic status can lead to an "effective" sex-ratio imbalance and that this imbalance can spill over across countries through marriage immigration.

The second body of literature studies the interactions among work, marriage, and family options (see Goldin (2006) for review). Specifically, Fernández, Fogli and Olivetti (2004) provide a dynamic model that provides an intergenerational correlation in terms of men's attitude toward having a working wife. According to their model, we can explain the East Asian phenomenon studied in this paper as follows. In these countries, governments' policies, such as universal education and changing labor regulations, may directly increase gender equality in terms of education and labor-market outcomes. Because of their intergenerational transmission, cultural norms change with an S-shaped speed rate, meaning that change occurs slowly at first and drastically in the middle, and then it finally settles down. Compared to the United States, these developed East Asian countries experienced a remarkable increase in educational attainment and also economic development overall (i.e., beginning stage of the change); therefore, their cultural norms governing household formation will require more time to catch up with the improvement of the gender gap in education/labor-market opportunities.

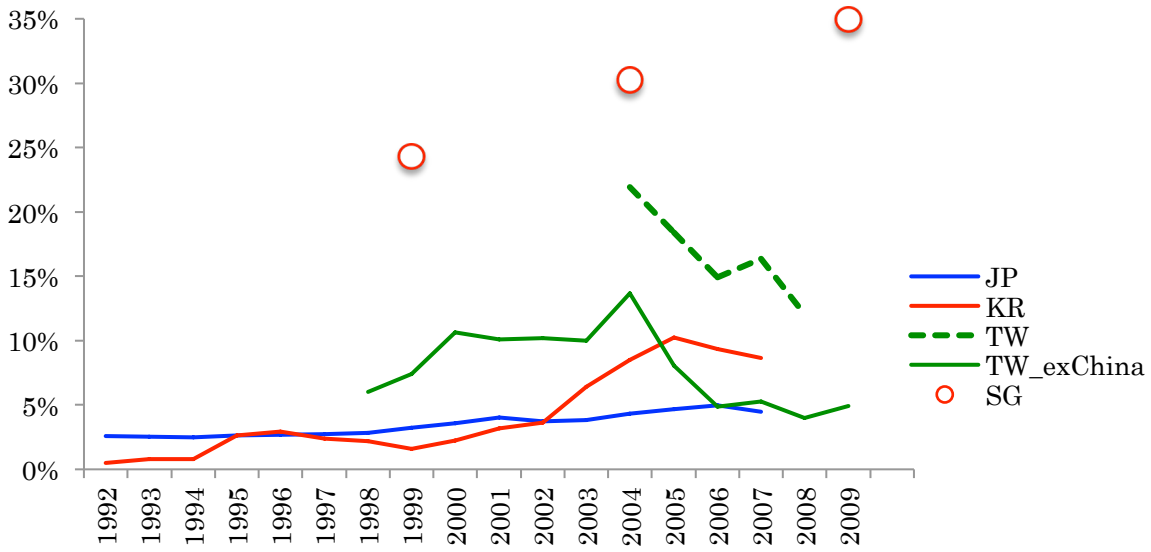
Last, this paper is related to the vast number of economic studies on immigration. Our paper provides evidence that just like work-related immigration, economic factors significantly account for marriage immigration and that marriage immigration has important socioeconomic implications for both immigrants' home and destination countries.

The rest of the paper is organized as follows. Section 2 presents background information about cross-border marriages in East Asia. Section 3 presents a theoretical framework, and Section 4 shows our empirical analysis. Section 5 examines possible alternative hypotheses accounting for the rise of marriage immigration, and Section 6 discusses additional issues regarding marriage immigration. Section 7 concludes the paper.

2 Institutional Background

We use aggregate statistics from marriage records in Japan, Korea, Singapore, and Taiwan and we plot the fraction of newlywed men whose bride is a foreigner among native grooms in each calendar year (Figure 1). The prevalence of foreign brides has increased over time in all countries except for Taiwan. Japan (blue line) exhibits a steady increase of foreign brides, reaching about 4 percent of all brides in 2007. Korea (red line) shows the most rapid growth in marriages between citizen grooms and non-citizen brides, increasing from less than 1 percent of all newlyweds in 1991 to 8 percent in 2007. In Singapore, foreigners consist of 30 to 40 percent of brides in 1999 and 2009. The graph for Taiwan requires additional explanation. The green line referred to as "TW_exChina" shows the fraction of Taiwanese grooms who have a non-Taiwanese bride who are not from Mainland China, Hong Kong, or Macao. We use this data series because of the data availability. Note that that data series is highly correlated with the fraction of Taiwanese grooms who have a foreign bride (including woman from China, Hong Kong or Macao) as denoted by the dashed green line. The fraction of Taiwanese grooms who have a foreign bride has steadily increased until 2004 when the Taiwanese government strengthened its immigration policies to discourage marriage immigration.

Figure 1 Fraction of Native Grooms Who have a Foreign Bride



Note: The graph shows the number of native grooms who have a foreign bride divided by the total number of native grooms who applied for marriage certificate in each year. JP, KR, SG, and TW refer to Japan, Korea, Singapore, and Taiwan, respectively. TW_exChina excludes the brides from China, Hong Kong, and Macao.

It is possible that a foreign bride in a marriage record can be an economic immigrant who later married a native man, and the most marriage records do not provide direct information distinguishing marriage immigrants and economic immigrants among foreign brides. Additional surveys suggest, however, that a significant fraction of foreign brides are marriage immigrants. In Korea, for example, about 79 percent of non-Korean women (including Korean-Chinese) who married Korean men came to Korea because of marriage; only 7.3 percent came to Korea for work and got married (Seol et al. (2009)).

Moreover, a substantial number of foreign brides met their spouses in connection with a "marriage tour," which takes the following procedure (Wang and Chang (2002), Seol et al (2009), Park and Choi (2008), and Presidential Committee on Social Inclusion in South Korea (2005)).[4] A marriage broker in a country, which we refer to as a host country, recruits men looking for spouses abroad. Another marriage broker recruits a group of women outside the host country (e.g., China, Vietnam, or the Philippines). We refer to a country where these women reside as the source country. When a sufficient number of men and women are recruited, the two brokers contact one other, and the broker in the host country organizes a group tour for the recruited men to visit the source country. The men and women have a few group dating sessions, during which they decide whom to marry. When they find their mate, they apply for a marriage license from the bride's local government. Then the groom goes back to his country and applies for a marriage certificate in his country, so that his bride can get a visa to enter his country as a legal immigrant.

Grooms generally pay for brokerage fees, legal processing fees, and payments to the bride's family. The total costs are estimated to be approximately 10,000 U.S. dollars.[5] Until marriage, interaction between men and women is minimal because the process is rapid (about 10 days for the marriage tour and 6 months until the women's immigration)

[4] The developed East Asian countries have more lenient policies to provide visas for marriage immigration than the US. Furthermore, they have no legal restriction on international marriage-brokerage agencies described in the text. In contrast, US legislators enacted the International Marriage Broker Regulation Act of 2005 and started to restrict the issuance of K-1 fiancée visas because of the upsurge in cross-border marriages through such marriage-brokerage agencies.

[5] In Japan, the cost ranges from 10,000 to 15,000 US dollars (authors' survey of web sites). Wang and Chang (2002) report 9,100 US dollars as the average fee charged by agencies in Taiwan that brokered the marriage of Taiwanese men and Vietnamese women in 2000. In Korea, the cost ranges roughly from USD 8,000 to 12,000 (Presidential Committee of Social Inclusion in South Korea, 2005).

and communication takes place through interpreters hired by the marriage brokers because the man and woman often do not speak a common language.

3. Theoretical Framework

3.1 Setting

We examine a marriage market where the number of native men, normalized as 1, is the same as that of native women. Each person is endowed with either high or low socioeconomic status referred to as the *H*- and *L*-type, respectively. We denote by h_G the fraction of *H*-type in sex $G \in \{m, w\}$ where *m* and *w* denote men and women, respectively. *H*-type has two subtypes: modern and traditional. The fraction of modern among *H*-type individuals in sex G is denoted by α_G with $0 \leq \alpha_G \leq 1$.

In the spirit of the non-transferable utility assumption (see Smith (2006)), a person has predetermined preferences over spousal characteristics. For simplicity, we assume that two individuals in a given type have the same preferences over spousal characteristics and an agent is indifferent between two partners as long as their type is the same. An individual's preferences are assumed as follows (see Table 1 for a summary of the environment). All women prefer a modern *H*-type man m_{MH} the most, followed by a traditional *H*-type man m_{TH}, and then an *L*-type man m_L. The only difference among women is that a modern *H*-type woman prefers remaining single to marrying a *L*-type man, while the rest of the women prefer marrying an *L*-type man to remaining single. As for men, all prefer a woman who is of the same type as their own the most. Regarding the remaining types of native women, a modern *H*-type man prefers a traditional *H*-type woman w_{TH} to an *L*-type woman w_L; and a traditional *H*-type man or *L*-type man prefers w_L to a modern *H*-type woman w_{MH}.

Finally, we assume that there is a unit measure of foreign women who are willing to marry any native man and that all men prefer marrying a foreigner to remaining single, although they prefer a native woman to a foreigner as a spouse. For simplicity, we assume that native women have no chance to marry a foreign man and a foreign woman has the same spousal preferences as an *L*-type woman.

Table 1 Summary of the Environment

Type	Size	Preference Ranking
Men		
Modern H-type (m_{MH})	$\alpha_m h_m$	$w_{MH} \succ w_{TH} \succ w_L \succ w_F \succ \emptyset$
Traditional H-type (m_{TH})	$(1-\alpha_m)h_m$	$w_{TH} \succ w_L \succ w_{MH} \succ w_F \succ \emptyset$
L-type (m_L)	$1-h_m$	$w_L \succ w_{TH} \succ w_{MH} \succ w_F \succ \emptyset$
Women		
Modern H-type (w_{MH})	$\alpha_w h_w$	$m_{MH} \succ m_{TH} \succ \emptyset \succ m_L$
Traditional H-type (w_{TH})	$(1-\alpha_w)h_w$	$m_{MH} \succ m_{TH} \succ m_L \succ \emptyset$
L-type (w_L)	$1-h_w$	$m_{MH} \succ m_{TH} \succ m_L \succ \emptyset$
Foreigners (w_F)	1	$m_{MH} \succ m_{TH} \succ m_L \succ \emptyset$

Note: $\emptyset$ denotes remaining single.

3.2 Stable Matching and Model Implications

We use stable matching to characterize our model's marriage-market equilibrium. By matching, we mean a one-to-one correspondence from the set of men and women in the marriage market onto itself, indicating who marries whom and who remains single. A matching is stable if no one wants to deviate from his/her marital status determined by the matching, by remaining single or by forming a household with another person with the person's agreement (see Roth and Sotomayor (1990) for a formal definition and the existence/properties of stable matchings).

Remark 1: In any stable matching, all *H*-type men get married to a native woman. All women of either traditional *H*-type or *L*-type marry a native man. *L*-type men marry either a native woman or foreigner, but do not remain single. Modern *H*-type women either marry an *H*-type man or remain single.

The proof is straightforward. Suppose that in a stable matching, an *H*-type man is single. Given the balanced sex ratio among natives and no possibility of importing foreign men as grooms, there is at least one native woman who remains single. Since all native women prefer marrying an *H*-type to remaining single, the *H*-type man and a native woman will form a blocking pair, and thus the matching cannot be stable. Likewise, a matching that leads to a woman of either the traditional *H*-type or *L*-type remaining single cannot be stable. Suppose not. Because of the balanced sex ratio among natives, some native men either remain single or marry a foreigner in that matching. All men, however, prefer marrying a native woman to remaining single or marrying a foreigner. Therefore, those men and single women will form blocking pairs. Since *L*-type men prefer marriage to

singlehood and there is an unlimited supply of foreign brides, all *L*-type men get married. Finally, some modern *H*-type women may remain single depending on market conditions because they prefer singlehood to marrying an *L*-type man.

With these remarks in hand, we can calculate the size for foreign brides.

Theorem 1 (Demand for Foreign Brides) The fraction of men who marry a foreigner is the same across stable matchings. This demand for foreign brides (*D*) is 0 if $\alpha_w h_w - \alpha_m h_m \leq 0$; $\alpha_w h_w - \alpha_m h_m$ if $0 \leq \alpha_w h_w - \alpha_m h_m \leq 1 - h_m$; and $1 - h_m$ if $1 - h_m \leq \alpha_w h_w - \alpha_m h_m$. **Proof.** (see Appendix)

Corollary 1 (Women's Education and Demand for Foreign Brides) All else being equal, the fraction of men marrying a foreigner weakly increases in h_w (decreases in h_m).

Corollary 2 (East Asian vs. Non-Asian Marriage Markets) All else being equal, the fraction of men marrying a foreigner weakly decreases in α_m $(-\alpha_w)$. We can characterize a developed East Asian country as a market with a smaller α_m (or greater α_w), compared to non-Asian developed country.

Based on these results, we derive three testable model implications:

(I.1) Improvement of women's socioeconomic status relative to men is positively correlated with the fraction of grooms marrying a foreigner.

(I.2) An *L*-type man is weakly more likely to have a foreign bride than an *H*-type man.

(I.3) An *L*-type woman is weakly more likely to get married than an *H*-type woman.

3.3 Discussions

Model Selection

We simplify our theoretical model in various respects. For example, we assume that an individual is indifferent between two persons as long as they have the same type, instead of allowing a match-specific component. We also do not allow for the possibility that individuals make investments to raise their socioeconomic status,[6] and we do not model a global marriage market in which people choose whom to marry across countries. We rule out those possibilities in our model mainly because our simple model aims to illustrate our main argument regarding the interaction between gender gap, cultural norms, and demand

[6] Note that existing research already provides a theoretical analysis of the interplay between educational choice and household formation in a closed economy (e.g., Iyigun and Walsh (2007) and Chiapporri et al (2009)).

for foreign brides in a straightforward manner. Note that our main argument can be extended in a model where individuals have match-specific components by introducing multinomial logit style assumptions (see Choo and Siow (2006)), or it could be extended in a multinational setting by following a standard international trade model with differentiated products (e.g., Krugman (1979)).

Preferences, Culture Norms, and Home Production

Despite the simplicity, our model captures some important features of marriage markets. For example, our assumption on men's preferences over wife's socioeconomic status is consistent with findings in the economics of marriage literature; that is, men value women's education only up to the point where women's educational attainment does not surpass men's own educational attainment (e.g., Fisman et al. (2006) for the United States and Lee (2011) for Korea). This finding is incorporated in our model by assuming that men prefer women who have the same type as theirs the most.

To explain why a developed East Asian country heavily relies on foreign brides whereas its counterpart outside East Asia does not, we suggest the possibility that developed East Asian countries have a larger fraction of modern women among *H*-type women than non-Asian developed countries. Recall that a *H*-type woman is referred to as modern in our model if she prefers being single instead of marrying a *L*-type man. We find some suggestive evidence based on time-use surveys of Japan, Korea, and the United States. Particularly, we find empirical patterns suggesting that net gains from marriage for educated women may be lower in East Asia than in the United States and that marrying an *L*-type man may not provide sufficient benefits to these educated women in East Asia. Table 3 tabulates the average minutes spent on each activity per day, including weekends, in each country. Two features are worth highlighting regarding differences in cultural norms. In Japan and Korea, the amount of market work for married college women is equivalent to or less than that of married women without college education. In contrast, in the United States, college-educated married women spend about 40 to 50 percent more time on market work than married women without college degrees. The difference in market activities among married women implies that if a woman gets married in an East Asian country, her returns to education in the labor market may be lower than those of her

counterparts in the United States. The second feature worth noting is that a woman appears not to gain much from "marrying down." We consider the amount of leisure time as a married woman's private consumption, and thus it is positively correlated with her net gains from marriage. In the United States, a college-graduate woman whose husband does not have a college degree spends more time on leisure compared to another college graduate who married a college-graduate man. In contrast, the former spends less or an equal amount of time on leisure than the latter in Korea and Japan, which may be explained by the fact that in East Asia, childcare (along with many of home production) is still considered women's task, not husbands', and the marketization of home production is still limited.

Table 2 Daily Time Use of Married Individuals in Korea, Japan, and the United States. Unit: Minutes per day

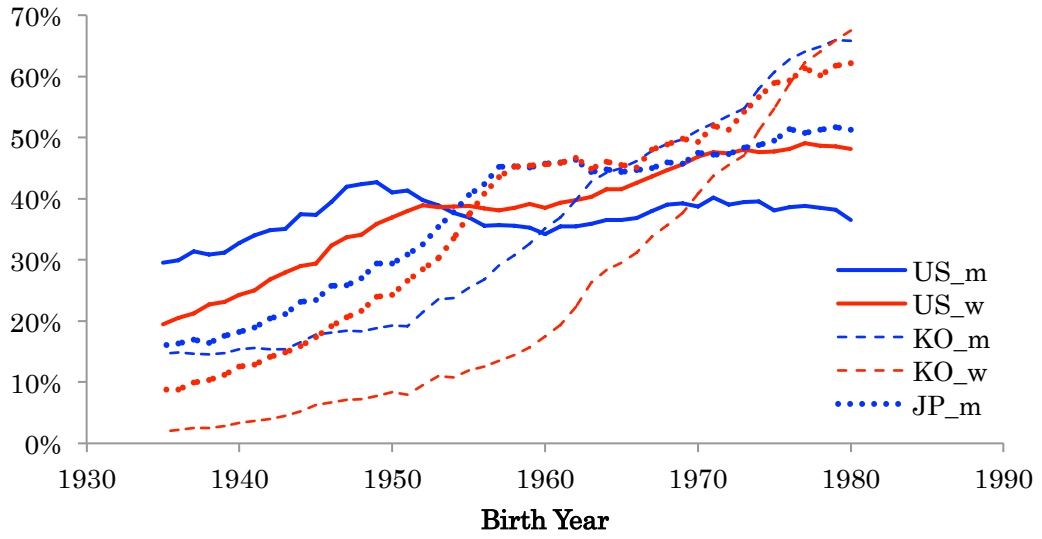
	Korea			Japan			U.S.		
	M	H	L	M	H	L	M	H	L
Wife: Coll.									
- Husband: Coll.	130	308	247	164	365	287	224	250	336
- Husband: Non Coll.	134	305	240	196	330	285	228	239	345
Wife: Non Coll.									
– Husband: Coll.	137	277	274	137	332	328	144	275	384
– Husband: Non Coll.	173	250	261	166	297	322	160	257	376
Husband: Coll.									
- Wife: Coll.	333	52	258	449	51	320	320	161	358
- Wife: Non Coll.	332	38	287	450	44	323	289	159	379
Husband: Non Coll.									
– Wife: Coll.	345	49	240	366	48	379	283	162	387
– Wife: Non Coll.	304	40	303	334	44	392	221	155	426

Note: M - market production, H - household production, L – leisure. Korea time use survey 2009, Japan time use survey 2006, and American time use survey 2009 are used. College graduate includes graduates from junior colleges. Sampling weight is applied. For Korea, M includes work and work related activities. H includes housework, child-care, caring and nursing. L includes TV, socializing, relaxing and recreation, sports, exercise and recreation, religious and spiritual activities, telephone calls, and traveling. For Japan, M includes work, schoolwork, commuting to/from school or work, studying and researching. H includes housework, child-care, caring and nursing, and shopping. L includes TV, radio, reading, rest and relaxation, hobbies and amusements, sports, volunteer and social activities, and social life. For the United States, M includes working and work-related activities, and educational activities. H includes household activities, caring for and helping household members, caring for and helping non-household members, consumer purchases, professional and personal care services, household services, and government services and civic obligations. L includes socializing, relaxing and recreation, sports, exercise and recreation, religious and spiritual activities, telephone calls, volunteer activities, and traveling.

Regarding size of modern-type men, we argue that these East Asian countries are likely to have a smaller fraction of *H*-type men than other developed non-Asian countries. Specifically, Fernández et al. (2004) suggest an intergenerational mechanism in which a mother's economic status (working vs. stay-at-home mother) affects her son's preference for having a working woman as his wife. In their model, a country may initially experience a slow increase in women's labor-market participation, because it takes time to have sufficient number of men who have a positive attitude about having a working woman as a wife. They provide detailed empirical evidences supporting the existence of the intergenerational interaction. In the context of the marriage markets we study, we can consider a modern *H*-type woman as a "working woman" in their model and a modern *H*-type man as a man who grew up with a working mother. If the intergenerational mechanism suggested by Fernández et al. (2004) exists in marriage markets, then, their model implies the following. Consider two countries that are identical, including the various educational attainments among cohorts currently participating in their marriage market. Suppose that one country has far fewer educated among parents whose children are searching for a spouse than the other. Then, the former, which experienced a faster improvement in educational attainment across cohorts, will have fewer modern-type men than the latter. Consistent with this implication, East Asian countries have faster improvement in education than other Western developed countries.[7] For example, Figure 2 shows the fraction of college graduates of each sex and cohort in Japan, Korea, and the United States. Both Japan and Korea have higher educational attainment than the United States for cohorts born after 1997, while cohorts born prior to 1950, for example, are more educated in the United States than in the latter two countries.

[7] Furthermore, Asian parents-in-law can directly affect a married woman's labor-market participation instead of indirectly through their sons. In East Asia, many activities involve extended families, which typically require a married woman to serve her parents-in-law. Suppose that a working mother has parents-in-law who demand all the services that are traditionally given by a daughter-in-law (e.g., visiting them every weekend and serving meals). Then, the working mother not only has to work for a full-time job, taking care of a child (because her husband's contribution to household production will be minimal), but she also needs to take care of her in-laws. Therefore, her benefit from participating in a labor market can be much lower as compared the case where she would have modern parents-in-law who do not demand much service from her.

Figure 2 Fraction of College Educated by Sex and Cohort



Note: United States Population Census (2010), South Korean Population Census(2010), Japanese Employment Status Survey (2007). United States_m, KO_m, and JP_m show the fraction of college educated among men (women) in each cohort in the United States, South Korea, and Japan, respectively. Similarly, United States_w, KO_w, and JP_w refer to the fraction of college graduates among women in each of the three countries.

4. Empirical Analysis

This section examines the implications of our theoretical model, using datasets from Japan, Korea, Singapore, and Taiwan. In our empirical analysis, we use a person's educational attainment as a proxy for his/her socioeconomic status. Particularly, we consider a person who had a tertiary education as *H*-type and the rest as *L*-type. The availability of data substantially varies by country and the type of information. Therefore, we classify our model implications into two groups, explain the data we use, and test model implications in each group.

4.1 Prevalence of Foreign Spouses, Gender Gap, and Singlehood

For Japan, Korea, Singapore, and Taiwan, we compile a dataset based on aggregate statistics from census and marriage records between 1990 and 2010. Table 3 presents summary statistics from our data. In each census year, we report the fraction of foreigners among newlywed brides and grooms (columns 1 and 2).[8]

[8] The statistics from Taiwan require some explanation. First, because of data availability, the statistics reported in Panel D exclude brides from Mainland
China, HK, and Macao (see details in Section 2.4 of Appendix). Second, the decrease in the importance of

Table 3 Summary of the Environment

	Natives Marrying a foreigner [a)]		College Educated [b)]		Diff. in % Unmarried (College vs. Not) [c)]		Sex Ratio [d)]
	Men %	Women %	Men %	Men – Women %pts.	Men %pts.	Women %pts.	
Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Panel A. Japan				
1992	2.6	0.9	36.1	-1.6	-3.2	3.3	102.1
1997	2.7	1.0	39.0	-4.2	-4.0	2.4	102.6
2002	3.7	1.1	41.6	-6.5	-5.0	1.7	102.3
2007	4.5	1.2	47.9	-7.0	-3.4	1.0	102.8
			Panel B. Korea				
1990	0.2	1.0	31.0	13.2	-2.5	3.5	104.5
1995	2.6	0.8	39.5	12.2	-4.9	3.4	103.9
2000	2.2	1.5	46.8	8.5	-8.5	4.1	104.0
2005	10.2	4.2	58.1	4.4	-6.8	7.3	103.4
			Panel C. Singapore				
2000	24.3	10.9	39.4	3.0	-4.6	10.8	96.6
2010	35.0	13.2	63.3	-2.6	-10.5	7.8	94.5
			Panel D. Taiwan [e)]				
1998	5.9	1.2	25.1	1.4	-	-	105.0
2000	10.5	1.3	31.9	0.1	-	-	104.8
2005	8.6	2.3	49.8	-3.8	-	-	103.4
2008	4.0	2.1	55.4	-4.2	-	-	102.2

Note: See Section 2 of the Appendix for sources and definitions for each country.
a) Fraction of citizen grooms who married a foreign bride (column 1) and that of citizen brides who married a foreign groom (column 2).
b) Fraction of college educated among men whose age is between 20 and 39 (column 3). The numbers in column 4 are the fraction of college educated men among men minus the fraction of college educated women among women ages 20 to 39.
c) We use the population whose age is between 30 and 39 to exclude individuals enrolled in a tertiary education institute who may postpone their marriage due to schooling. For each sex and education level, we compute the fraction of unmarried people. We then report the difference in this fraction between college educated and non-college educated (see details in Appendix 2).
d) We use the population whose age is between 20 and 39. Sex ratio refers to the number of men divided by women times 100.
e) Foreign brides exclude Chinese from Mainland China, HK, and Macao. The drop in the fraction of foreign brides in 2005 and 2008 is caused by immigration policy changes since 2000. The immigration policy changes include language sufficiency tests, interviews, and no issuance of a spouse visa if the age gap between a groom and bride is over 20 years (see Kim et al. (2010) for details).

foreign brides in 2005 and 2009 is caused by immigration policy changes. In particular, the Taiwanese government imposed stricter restrictions regarding marriage immigrants in response to the public outrage over foreign brides (Seol et al. (2009)). Before the policy change was introduced, the fraction of foreigners among brides had continually increased (Figure A.1 of Appendix).

We then report some statistics capturing marriage-market conditions for each year and country using population censuses and other data sources. To understand the concurrent conditions of a marriage market, we focus on individuals whose age is between 20 and 39 because they are presumably actively participating in the marriage market.

Gender Gap in Education and Demand for Foreign Spouses

Column 3 of Table 3 reports the fraction of college-educated men among men aged between 20 and 39, and column 4 reports a measure of the gender gap between men's educational attainment and women's. The value in the first row (i.e., -1.6) means that the fraction of college-educated among women is 1.6 percentage points higher than that of men. In all countries, the gender gap has been decreasing over time. Our model implies that the gender gap is negatively correlated with the fraction of native men marrying a foreign bride (I.1), which we find in the data. As the gender gap in terms of the fraction of tertiary educated shrinks by 1 percentage point relative to a previous year, the fraction of grooms who marry a foreign bride increases by 1.04 percentage point, and this positive correlation is significant at the 1 percent level (see Table O.1 of Online Appendix).[9]

Education and Singlehood

Our model implies that women with tertiary education are more likely to remain single than women without tertiary education (I.3 of Section 3.2). To test this implication, we compute the fraction of singles among women whose age is between 30 and 39 depending on their educational attainment. Note that we take this age group because people are assumed to finish all their educational attainment by then. We take the difference in that fraction between college-educated women and the rest. The positive values in column 6 of Table 3 mean that a larger fraction of college-educated women remain single after age 30 compared to women without tertiary education. In all countries and census years, we find that a college-graduate woman is significantly more likely to remain single than her non-college-educated counterparts. Note that our result is robust to using different age criteria (e.g., using 35 or 40 instead of 30).

[9] Online Appendix is available at www.soohyunglee.com/research.

4.2 Education and Likelihood of Having a Foreign Spouse

Our model implies that, for men, a person with low socioeconomic status has a greater chance of having a foreign spouse (I.2). To test this implication, we use administrative datasets of marriage records from Japan (2000 and 2005) and Korea (2004 and 2005). The marriage records provide the age of the bride and the groom, marital history, employment status, occupation, current location of residence, and citizenship in both countries. By marital history, we mean whether a person had been married prior to his or her current marriage. Korean marriage records additionally collect information about educational attainment, which is not available in Japanese marriage records (see Section 2 of Appendix and Section B of Online Appendix for data sources).

Summary statistics of the data support our hypothesis. For example, in Japan, a large-scale company, that is, a firm employing 100 or more workers, provides a person higher income, job stability, and other amenities, as compared to a small- or medium sized company or self-employment. We find that the fraction of men working for a large-scale company is about 40 percent among Japanese grooms who have a Japanese bride, whereas the fraction is only 25 percent among Japanese grooms who have a foreign bride. Similarly, in Korea, the fraction of college educated is 63 percent among Korean grooms who have a native bride, whereas the fraction is only 15 percent among those who have a foreign bride (see further statistics in Section B of Online Appendix).

Certainly, it is possible that some variables that are correlated with men's socioeconomic status (e.g., age) may account for the likelihood of having a foreign bride. To control for such a possibility, we estimate a Probit model in which we regress a dummy indicating whether a groom has a foreign bride on all variables available in each country's marriage records. As shown in Table 4, taking such an approach, our observations remain the same. For instance, all else being equal, a high-school graduate groom in Korea is 7.6 percentage points more likely to have a foreign bride than his counterpart with a college degree. We conduct various robustness checks using imputed education and income, and our results remain qualitatively the same (see Table O.4 in Online Appendix).

One may suspect that our finding of the positive correlation between a man's socioeconomic status and the probability of having a foreign bride may be the result of

Table 4 Likelihood of Having a Foreign Spouse

(Probit Model: Marginal Effect)

	Native Grooms		Native Brides	
	Japan	Korea	Japan	Korea
	(1)	(2)	(3)	(4)
Age	0.002***	0.007***	0.0003***	0.002***
	(0.000)	(0.000)	(0.00001)	(0.000)
High school	-	0.076***	-	0.013***
		(0.001)		(0.000)
Middle school or less	-	0.165***	-	0.041***
		(0.003)		(0.002)
Managerial job	-0.004***	-0.010***	0.0007**	0.004***
	(0.000)	(0.001)	(0.0003)	(0.001)
Service and retailer sector	0.001***	0.005***	0.002***	0.026***
	(0.000)	(0.001)	(0.0003)	(0.001)
Agricultural sector	0.006***	0.069***	-0.005***	-0.012***
	(0.001)	(0.003)	(0.001)	(0.001)
Production job	0.010***	0.012***	0.004***	0.028***
	(0.001)	(0.001)	(0.0004)	(0.002)
Military/Security service	-0.010***	-0.035***	-0.003***	0.005
	(0.000)	(0.001)	(0.001)	(0.006)
Not working – Student	-	0.039***	-	0.043***
		(0.003)		(0.003)
Not working – Non-student	-0.019***	-0.019***	-0.024***	0.002***
	(0.000)	(0.001)	(0.0002)	(0.000)
Large firm	-0.011***	-	-0.002***	
	(0.000)		(0.0002)	
Pseudo R-sq	0.17	0.30	0.01	0.16
No. obs.	1,455,349	534,327	1,415,946	501,575

Note: Standard errors are in parentheses. The omitted categories are "junior college or more" for education and "white collar" jobs for occupation. Year dummy variables are included. Large firms include those working for a firm that employs 100 or more workers or those who are in management. Low-skilled job refers to production workers for Japan. Not working includes both students and non-students who do not have a job for Japan. The asterisks *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

selection.[10] For example, it is possible that an educated man may remain single rather than having a foreign bride, while an uneducated man may choose the opposite, which accounts for our finding. We argue that selection into marriage is unlikely to account for that positive correlation. In both Japan and Korea, a man is more likely to remain single after age 30 if he has a low socioeconomic status. For example, among men aged 30 to 39, the fraction of married among college educated is 3 percentage points more in Japan (2007)

[10] In our theoretical framework, the fraction of men who marry a foreign bride is equivalent to the fraction of grooms who have a foreign bride because in all stable matchings, all men in the marriage market get married.

and 7 percentage points more in Korea (2005) than that among men without tertiary education in the respective countries.

5 Alternative Explanations for the Rise of Female Marriage Immigration

5.1 Sex Ratio Imbalance in Sub-Population

Contrary to our main hypothesis, a reader may consider that raw sex-ratio imbalances still account for the increase in foreign brides. For example, even if raw sex ratio is stable in the total population, the ratio among people participating in the marriage market can become more imbalanced over time. To examine this possibility, we report raw sex ratios among people whose age is between 20 and 40, the prime cohort searching for a spouse, in each calendar year (column 7 of Table 3). The raw sex ratios in that age group remain stable over time or have the opposite time trend in each of four Asian countries. The decrease in sex ratios means that, all else being equal, a man will be in a better position for finding a spouse in his marriage market; therefore, raw sex ratios should be positively correlated with the demand for foreign brides. Column 7, however, shows that over the period of a significant increase in foreigners among brides, sex ratios are negatively correlated with the demand (see Table O.1 of the Online Appendix for details).

Relatedly, some may think that regional variation of sex ratios may account for the increase in marriage immigrants (e.g., Morgan and Hoffmann (2007)). It is true that in a given year, a man residing in a location with a sex-ratio imbalance (e.g., a farmer in a rural area) is more likely to marry a foreign woman. We find, however, that the fraction of single men who live in such an area decreased over time, while the prevalence of foreign brides increased. Therefore, the sex-ratio imbalance hypothesis cannot explain the time trend, although it may explain the allocation of foreigners across regions in a given year.

5.2 Male Marriage Immigrants

Another alternative explanation might be that during this time period, developed East Asian countries may have had an increase of male marriage immigrants, for example, because of a change of guest-worker systems, and this increase may account for the increase of female marriage immigrants. To examine this possibility, we report the fraction of native brides who have a foreign groom. Although this fraction is positively correlated with the fraction

of foreigners among brides in each calendar year, the prevalence of male marriage immigrants is much lower and steadily increasing as compared to female marriage immigrants. Therefore, this alternative is unlikely to account for the rise of female marriage immigration in East Asia.

Furthermore, in East Asia, male marriage immigration is different than female marriage immigration in various dimensions. For example, native brides who have a foreign groom do not necessarily have low socioeconomic status. We estimate a Probit model regressing an indicator of having a foreign broom on native brides' observable characteristics. Different from native grooms who have a foreign bride, we find that compared to a woman with a white-collar job, a managerial worker is more likely to have a foreign groom and a woman in the agricultural sector is less likely to have a foreign groom (see columns 3 and 4 of Table 4). This finding is accounted for by the fact that, different from native grooms, brides who have a foreign groom are more diverse, and, among them, women with a higher socioeconomic status have a groom from another developed country instead of a groom from less developed country. For example, in Korea, 47 percent of brides who have a groom from another developed country are college educated, whereas less than 6 percent of brides who have a Chinese groom are college educated. Thirteen percent of brides who have a groom from developed countries have a managerial job, whereas 9 percent of brides who have a Chinese groom have one.

6. Discussions

In this section, we conduct additional empirical analyses to address a few questions that have important policy implications, though the implications are not drawn from our theoretical model. The first question is what countries send their women as female marriage immigrants to the developed countries in East Asia. This analysis will help us predict "at risk" countries if another country (e.g., China) faces a demand for foreign brides. The second question is what types of women become marriage immigrants and how they differ from their counterparts in their home countries. The third question is whether there is any systematic pattern among native men in terms of choosing the country from which they bring their wives. Finally, we compare female marriage immigration with male marriage immigration in East Asian countries.

6.1 Source Countries of Female Marriage Migrants

Panel A of Table 5 shows the three major countries that send a large number of female marriage immigrants to Japan, Korea, and Taiwan. Each of these countries largely relies on countries that are closely located to it and less developed relative to it as major sources of foreign brides. To confirm this observation statistically, we conduct a regression analysis in the spirit of the gravity models used in international trade literature. We compile a cross-country dataset of 193 potential countries from which a country of interest could bring a foreign bride or groom. We estimate a Tobit model where the dependent variable is the logarithm of the number of foreign brides who came from a corresponding country in 2005. Note that the dependent variable is censored at zero. We use the difference in GDP per capita between a country of interest $H \in$ {Korea, Japan, Taiwan} and a potential trading partner for marriage immigration S. For a flexible specification, we use two variables: $|\ln Y^H - \ln Y^S|+$ is the absolute value of the per capita GDP gap between the two countries if the destination country H is more developed than country S, and zero otherwise. Likewise, $|\ln Y^H - \ln Y^S|-$ is the absolute value of per capita GDP gap if country S is more developed than country H, and zero otherwise. We also control for geographical distances between two countries and bilateral trade volume (sum of import and export) to proxy for cultural and economic proximity.[11]

In Table 6, we report our estimation results based on a pooled sample of Japan, Korea, and Taiwan. The gap in GDP per capita between the destination country H and country S is positively correlated with the number of women a country sends as marriage immigrants to a developed East Asian country, even after controlling for cultural and economic ties. These findings remain qualitatively the same if we run the regression separately (see Table O.5 of Online Appendix). After controlling for trade volume and geographic distance, a country's GDP per capita is negatively correlated with the number

[11] For Korea and Japan, we used the World Bank Development Indicator to collect all variables except for physical distance. For physical distance between two countries, we use a dataset from *CEPII*. The CEPII provides two measures of distance between the two countries. One is the physical distance between the two capital cities. The other is the population-weighted distance based on multiple locations. We use the first measure because it is available for a large number of countries and is highly correlated with the population-weighted distance. For Taiwan, we gather GDP per capita from the World Bank Development Indicator, trade volume from the Bureau of Foreign Trade of Republic of China and physical distance from *GEOBYTE* and *GlobeFeed*.

Table 5 Major Source Countries of Marriage Immigrants

	(1)	(2)	(3)
Panel A. Source of Female Marriage Immigrants			
Japan	China	Philippines	Korea
	(38.1)	(32.1)	(21.2)
Korea	China	Vietnam	Philippines
	(71.5)	(12.8)	(3.6)
Taiwan	China	Vietnam	Indonesia
	(45.6)	(35.4)	(8.2)
Panel B. Source of Male Marriage Immigrants			
Japan	Korea	U.S.	China
	(41.9)	(18.5)	(11.2)
Korea	China	Japan	U.S.
	(41.8)	(31.2)	(11.1)
Taiwan	Japan	Thailand	U.S.
	(23.4)	(13.1)	(12.4)

Note: The table reports the top three countries for foreign brides (Panel A) or foreign grooms (Panel B). Numbers in parentheses refer to the number of individuals from the corresponding country divided by the total number of foreign spouses. The statistics are based on marriage records of Japan (2000, 2005), Korea (2004, 2005), and Taiwan (2004, 2005). See details in Section 2 of Appendix and Online Appendix (Section E).

Table 6 Source Countries of Foreign Spouses

Dep. Var.	Log (Brides)			Log (Grooms)		
	(1)	(2)	(3)	(4)	(5)	(6)
$\lvert \ln Y^H - \ln Y^S \rvert +$	-0.495	1.793***	2.249***	-1.625**	1.120*	0.782
	(0.608)	(0.645)	(0.712)	(0.694)	(0.639)	(0.681)
$\lvert \ln Y^H - \ln Y^S \rvert -$	2.709	1.083	0.447	4.818**	2.994	3.734*
	(2.457)	(2.348)	(2.369)	(2.311)	(2.120)	(2.234)
ln (Trade)	-	2.116***	2.105***	-	3.113***	3.140***
		(0.407)	(0.389)		(0.588)	(0.583)
ln (Distance)	-8.685***	-3.842***	-2.917***	-6.646***	-0.035	-0.650
	(1.432)	(1.023)	(1.206)	(1.378)	(1.041)	(1.183)
Region Dummy	No	No	Yes	No	No	Yes
% with Non Zero	8.23	8.23	8.23	7.74	7.74	7.74
No obs.	462	462	462	462	462	462
PseudoR2	0.26	0.26	0.29	0.14	0.31	0.34

Note: The unit of observations is country from which Japan, Korea, or Taiwan would bring marriage immigrants. Heteroskedasticity robust standard errors are reported in parentheses. Pooled regression model includes host country dummy variables. Region dummy variables are defined for 6 regions: East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, South Asia, and Sub-Saharan Africa.

of women the country sends to Japan, Korea, or Taiwan as brides. A 1 percent increase in the GDP gap is correlated with the number of brides from the country by about 1.8 percent (Column 2 of Table 6). The size of female marriage immigrants from a country is positively correlated with the strength of socioeconomic ties to a host country. We consider that a country has stronger ties to a host country if it has a larger trade volume with or is geographically closely located to the host country. The estimation results do not change even after including 6 regional dummy variables (Column 3 of Table 6).

In contrast, a large number of male immigrants are from developed countries such as the United States (for all three countries) and Japan (for Korea and Taiwan). Column 4 of Table 6 shows that, conditional on the geographical distance, when a country has a larger GDP per capita than Japan, Korea, and Taiwan, a greater number of native women marry men from that country (e.g., male marriage immigrants). When we control for trade volumes between the two countries (columns 5 and 6), there is only a weak correlation between the GDP per capita gap and the number of male marriage immigrants, which differs from our results for female marriage immigrations.

Why do we find a positive correlation between the GDP per capita gap and the number of female marriage immigrants, but no correlation between the GDP per capita gap and the number of male marriage immigrants? Regarding female marriage immigrations, the GDP per capita can be positively correlated to both groom's and bride's gains from marriage. From a marriage immigrant's perspective, the GDP per capita difference between a host country and the immigrant's home country can be a proxy for the gains from marriage immigration, because he/she can expect a higher living standard and send a larger amount of remittances to his/her own family back in the source country. Next consider a native man who choosing between a woman from country *A* and another woman from country *B*. Suppose that the GDP per capita gap between the man's country and *A* is larger than that between his country and country *B*. The native man may prefer the woman from country *A* (less developed than country *B*) because he can gain more bargaining power and thus may transfer less of his income to his spouse. Therefore, the GDP per capita gap can be positively correlated with the gains from marriage of both native men and potential female immigrants. In contrast, from a native woman's perspective, marrying a person from a less developed country (thus large GDP per capita gap) can be negatively correlated

with her gains from marriage. In East Asian countries, there still exists a substantial gender gap in labor markets (measured by labor-market participation or wage gap). Therefore, a husband's income, instead of the wife's, can largely determine the total gains from marriage. If this is the case, then marrying a man from a less-developed country implies that the total gains from marriage will be low, which can dominate the benefit that a native woman may have by having a stronger bargaining power.

6.2 Characteristics of Foreign Brides

Table 7 reports the average characteristics of brides depending on their nationalities. In both Korea and Japan, foreign brides are substantially different from native brides in terms of socioeconomic status and demography. An interesting finding is that even among foreign brides, there are large differences in brides' characteristics across their nationalities. For example, Chinese brides in both Japan and Korea are on average older and more likely to have had a previous marriage than average Vietnamese or Filipino brides. A noticeable pattern is that in Korea, about 11 percent of Vietnamese brides work in the agricultural sector, whereas less than 2 percent of non-citizen brides from China or the Philippines do. It is possible that the observed differences across brides' nationalities can be entirely caused by the heterogeneity in their grooms' characteristics; for instance, an old groom marries a Chinese woman, whereas a young groom marries a Vietnamese woman. Using propensity score matching, we control for groom's characteristics and find that the aforementioned difference across nationalities remains qualitatively the same (see Section E of Online Appendix).

Next we compare the educational attainment of female marriage immigrants with their peers remaining in their home countries to understand its implications for the home countries' human capital accumulation and labor markets. We conduct this analysis only for marriage immigrants to Korea because Japanese marriage records do not contain such information. We use the censuses of China (2005), Vietnam (1999), and the Philippines (2000).[12]

[12] For the 2005 Chinese census, we use the cross-tabulation of sex, age, and educational attainment provided by the National Bureau of Statistics of China. The tabulation reports the number of individuals in each category. The censuses of Vietnam and Philippines are available at IPUMS international.

Table 7 Brides' Characteristics Depending on Their Nationality

Panel A: Japan

	Japan	China	Philippines	Korea	Other developing	Developed
	(1)	(3)	(4)	(5)	(6)	(7)
No. Newlyweds (unit: thousand)	1415.95	20.72	17.47	11.56	4.18	0.49
(% of all newlyweds)	(96.30)	(1.41)	(1.19)	(0.79)	(0.28)	(0.03)
Age	28.56	31.36	28.05	34.69	32.35	31.68
Ever married (%)	13.92	44.31	12.34	40.36	35.27	24.07
Not working (%)	33.60	66.46	78.46	67.41	66.71	41.36
Work for a large firm (%, if working)	37.17	15.28	5.00	17.52	15.45	35.44
Occupation (%, if working)						
- Professional and managers	25.09	14.03	5.85	16.85	9.27	58.60
- Sales and Service	26.19	29.74	30.81	37.87	29.74	12.98
- Agriculture	0.26	4.29	2.02	0.24	4.60	0.00
- Low-skilled	11.47	34.24	56.11	22.27	47.13	12.98

Panel B: Korea

	Korean	China	Vietnam	Philippines	Other developing	Developed
	(1)	(3)	(4)	(5)	(6)	(7)
No. Newlyweds (unit: thousand)	495.16	35.15	6.22	1.75	3.27	2.10
(% of all newlyweds)	(91.08)	(6.47)	(1.14)	(0.32)	(0.60)	(0.39)
% Currently living outside Korea	0.02	97.45	97.30	95.31	94.25	92.34
Age	28.80	35.31	22.62	25.80	27.55	30.57
Ever married (%)	13.54	64.77	1.52	1.46	13.86	11.45
Education (%)						
- College or more	59.89	6.88	4.46	43.25	47.81	76.27
- High school	36.52	48.25	45.88	50.41	41.34	22.27
- Middle school or less	3.59	44.87	49.66	6.33	10.84	1.46
Employment status (%)						
- a white-collar job	24.68	5.96	2.01	6.78	7.01	17.57
- a managerial job	15.04	1.45	0.71	4.30	5.40	15.12
- the service and retailer sector	7.74	5.68	1.62	4.42	4.82	6.63
- the agricultural sector	0.23	1.21	11.52	0.97	2.22	0.15
- a low-skilled job	1.91	2.34	1.49	1.45	2.80	0.69
- Not working – Student	2.15	0.82	1.01	1.03	4.12	7.66
- Not working – Non-student	48.09	82.45	81.53	80.88	73.43	51.60

Because some brides from Vietnam and the Philippines were too young to have completed their educational attainment in the census year, we limit our sample to foreign brides who were over 19 years old when the census was carried out. Then, for each of the three countries, we calculate weights such that the weighted distribution of cohorts in the census is the same as the raw distribution of cohorts among marriage immigrants from that country. Using those weights, we calculate the weighted distribution of women's educational attainment.

We find that overall, foreign brides are generally more educated than their counterparts in their home countries and the difference is statistically significant based on Kolmogorov and Smirnov tests (see Table 8). For example, over 94 percent of Chinese brides in Korea have at least secondary education, about 22 percentage points higher than the female population in China. We find similar patterns among Vietnamese brides. An interesting observation is found among Filipino marriage immigrants: Filipino brides are, on average, more educated than their peers in the Philippines as well as female overseas workers. These findings suggest that, in terms of educational attainment, non-citizen brides are positively selected from the population.

Table 8 Foreign Brides in Korea and Women in Their Home Country

(unit: Percent)

	Primary	Secondary	Tertiary
Panel A. Chinese			
Brides	5.78	87.26	6.96
Population (Women)	27.18	64.72	8.11
Panel B. Vietnamese			
Brides	6.13	85.34	8.53
Population (Women)	35.92	57.77	6.31
Panel B. Filipino			
Brides	1.31	46.42	52.27
Population (Women)	22.37	39.33	38.30
Population (Female overseas workers)	13.64	36.89	49.47

Source: Marriage Records of Korea (2004, 2005), Population Censuses of China (2005), Vietnam (1999), and the Philippines (2000).

6.3 Men's Choice of Bride's Nationality

Given the fact that brides' characteristics vary by their home countries, we study men's choice of their brides' home country. Specifically, we conduct the following thought experiment with a Multinomial Logit model. Consider two grooms who have the same

observable characteristics except for one dimension (e.g., education). Would their brides be more likely to come from the same country? We classify brides' home countries into six categories: a groom's home country (i.e., native bride), three major countries sending women to his country, another developing country, and a developed country. We then estimate a Multinomial Logit model using the micro-level marriage records in Japan and Korea. As for explanatory variables, we include groom's age and dummy variables for marital history, occupation, and year (and education for Korea).

Table 9 Choice of Bride's Nationality Based on Groom's Characteristics

Panel A: Japan

	Japan	China	Philippines	Korea	Other developing	Developed
(Unit: Percentage points)	(1)	(1)	(2)	(3)	(4)	(5)
Age	-0.20	0.08	0.06	0.04	0.02	0.00
Agriculture	-0.90	0.51	0.19	0.09	0.11	-0.00
Low-skilled job	-1.01	0.36	0.35	0.13	0.17	-0.00
Security	0.96	-0.34	-0.29	-0.27	-0.06	0.00
Not working	1.81	-0.74	-0.57	-0.39	-0.13	0.03
No obs., Pseudo R-sq			1,470,369	0.13		
% obs. (prediction= choice)				96.27		

Panel B: Korea

	Korea	China	Vietnam	Philippines	Other developing	Developed
(Unit: Percentage points)	(1)	(2)	(3)	(4)	(5)	(6)
Age	-0.46	0.34	0.05	0.02	0.04	0.01
High school	-6.55	5.13	0.87	0.26	0.45	-0.16
Middle school or less	-14.81	11.45	1.90	0.81	0.87	-0.22
Agriculture sector	-4.00	0.51	1.87	0.67	0.92	0.03
Low-skilled job	-0.60	0.33	0.08	0.07	0.18	-0.06
Not working – Student	2.99	-1.95	-0.35	-0.14	-0.42	-0.13
Not working – Non-student	1.30	-1.09	-0.19	-0.03	-0.15	0.16
No obs., Pseudo R-sq				534,327	0.27	
% obs. (prediction = choice)				91.55		

Note: This table reports the marginal effects of the multinomial logit regression. We additionally include dummy variables for occupation, and year. Consider Panel A. Among Korean grooms, a one-year increase in the age of a groom is associated with 0.34 percentage-point increase in the likelihood of marrying a Chinese bride, a 0.05 percentage-point increase in the likelihood of marrying a Vietnamese bride, and so on, while it decreases the likelihood of marrying a Korean bride by 0.46 percentage point.

For expositional simplicity, we report the marginal effects of key variables on the likelihood of marrying a woman from each category in Table 9. Note that all reported marginal effects are significant at the 1-percent level except for some in columns 5 and 6. Consider “low-skilled job” in Panel A. The statistics imply that a Japanese groom with a low-skilled occupation is more likely to have a Chinese bride by 0.36 percentage point compared to his counterpart clerical worker.

Results from Korea (Panel B) suggest an interesting possibility of assortative matching among cross-border marriages. Compared to his counterpart with a white-collar job, a Korean groom working in the agricultural sector is 1.87 percentage points more likely to have a Vietnamese bride and 0.51 percentage point more likely to have a Chinese bride, while his likelihood of having a Korean bride is lower than his counterpart (by 4.00 percentage points). As the marginal effect of being an agricultural-sector worker on having a Vietnamese bride exceeds that of Chinese, it means that a Korean groom working in the agricultural sector is much more likely to have a Vietnamese bride than a Chinese bride. Then why is a Korean agricultural-sector groom likely to choose a Vietnamese bride over a Chinese bride? One possibility is related to sorting along occupation. As discussed in Section 5.2, the fraction of Vietnamese brides who work in the agricultural sector in their home country is much larger than that of Chinese women. As agricultural production in Korea largely relies on a household's labor supply, a Korean farmer may find a Vietnamese woman more suitable for his farming production than a Chinese woman.

7. Conclusion

This paper documents the recent yet significant international marriage immigration commonly observed in developed East Asian countries. Using an economic framework, we explain that such a phenomenon is accounted for by both rapid advancements in women’s labor-market opportunities and insufficient adjustments in cultural norms determining a person’s net gains from marriage. Using datasets from Japan, Korea, Singapore, and Taiwan, we conduct micro and macro empirical analyses, whose results support our theoretical model.

This paper naturally raises various research questions. How does the large influx of marriage immigrants affect natives' marriage opportunity, marriage surplus, and divorce? To what extent will a cross-border marriage be similar to a marriage between two natives in terms of fertility, dissolution, and bargaining power? How does sending a large number of women to other countries as brides affect the brides' home country, for example, through changing the sex ratio and remittances? How much would it be worth to become a marriage immigrant for a woman and her family? Would this monetary value be similarly determined as a dowry, as observed in India or other societies?[13]

Another importance future research topic is China's possible impact on the world's marriage markets. We expect that China will soon face a demand for foreign brides like that of Japan, Korea, Singapore and Taiwan. China not only has imbalanced raw sex ratios but also shares similar cultural norms that discourage accomplished women from marriage markets (see a recent media report at Salon.com, 2012). Once Chinese men less preferred by Chinese women can afford the associated cost of "importing" a bride (and relevant regulations allow them to do so), then, because of the population size, China's demand for foreign brides will immensely affect other countries' marriage markets and socioeconomic conditions, much more than what the four East Asian countries may have done. Furthermore, those four Asian countries may not be able to rely on foreign brides to clear their marriage market if China starts to be an importer of female marriage immigrants. First, the supply of female immigrants from China on which they heavily rely may be reduced if Chinese women get a better match from their own marriage market because of a sex-ratio imbalance favoring women. Second, based on our gravity model estimation, we expect that as a major source country of foreign brides, China is likely to turn to similar sets of countries as those on which the four developed Asian countries currently rely. This implies that these four countries may have to compete against China over women in Vietnam, for example, to meet their demand for foreign brides.

[13] Many economists theoretically and empirically study dowries in a marriage market. Examples of those studies include Botticini and Siow (2003) and Anderson (2003).

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Appendix

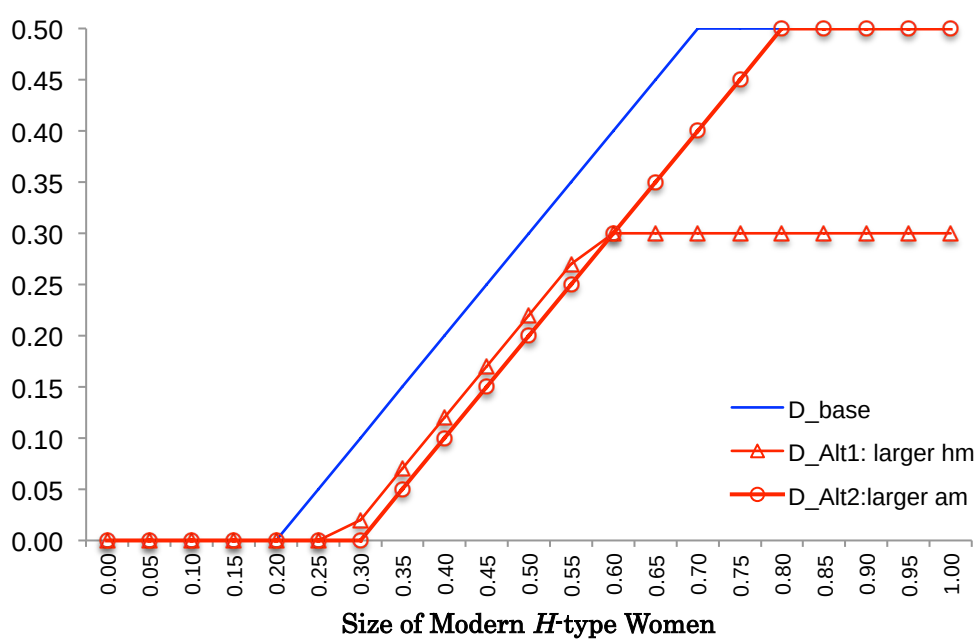
1. Proof of Theorem 1

Remark 1 implies that the number of men marrying a foreigner is the same as the number of modern *H*-type women remaining single. With this implication in hand, let us examine stable matchings. In this marriage market, modern *H*-type men are the men most preferred by women. Therefore, in any stable matching, these men will marry their first choice—that

is, a modern *H*-type woman—as long as there is a large enough supply of this type of women. Suppose that $\alpha_m h_m$ is greater than or equal to $\alpha_w h_w$. Then, all modern *H*-type women have a modern *H*-type husband. Therefore, no modern *H*-type woman remains single. Given the preferences of natives, this means that no man will have a foreign bride.

Alternatively, suppose that $\alpha_m h_m$ is less than $\alpha_w h_w$. Then, only $\alpha_m h_m$ number of modern *H*-type women marry modern *H*-type men, and the rest $(\alpha_w h_w - \alpha_m h_m)$ need to either marry a traditional *H*-type man or remain single. Since traditional *H*-type men prefer the modern *H*-type women the least among native women, they will marry one of the remaining modern *H*-type women only if the number of traditional *H*-type men exceed the sum of traditional *H*-type women and *L*-type women. The number of traditional *H*-type men who are willing to marry any of the remaining modern *H*-type women is $\max(0, \alpha_w h_w - \alpha_m h_m - 1 + h_m))$. Therefore, if $\alpha_w h_w - \alpha_m h_m$ is positive but smaller than $1 - h_m$, then all the modern *H*-type women who did not get married with a modern *H*-type man will remain single. If $\alpha_w h_w - \alpha_m h_m$ is greater than $1 - h_m$, then, the number of modern *H*-type women who remain single is the difference of the remaining and the number of traditional *H*–type men who are willing to marry a modern *H*-type woman, $1 - h_m$.

Figure A.1 Fraction of Native Grooms Who have a Foreign Bride



In Figure A.1, we plot the number of grooms who have a foreign bride as a function of the size of modern *H*-type women, when h_m is 0.5 and α_m is 0.4 (the line marked with "D_base"). As the size of modern H-type women increases, the number of native grooms who have a foreign bride increases. When we increase the gender gap in socioeconomic status by increasing the size of *H*-type men from 0.5 to 0.7 (the line marked with "D_Alt1"), the number of men marrying a foreign bride decreases (Corollary 1). When we increase the size of modern men by increasing α_m from 0.4 to 0.6 (the line marked with "D_Alt2"), the demand for foreign brides decreases (Corollary 2).

2. Data

2.1 Japan

We use the "Employment Status Survey (1992, 1997, 2002, 2007)" published by the Japanese Ministry of Internal Affairs and Communications to calculate the sex ratio and educational attainment among people aged 20 to 39. We define a person as college educated if he/she attended or has a degree from a 2-year or 4-year college or polytechnic called *Kosen*. We use the corresponding marriage records from the vital statistics to calculate the fraction of foreigners among brides or grooms. By "foreigners," we mean persons who do not hold Japanese citizenship. We obtain micro-level datasets of marriage records for 2000 and 2005. These two years are selected because occupational information is recoded in years ending with 0 or 5.

2.2 Korea

We use the Korean Population Census to construct educational attainments and sex ratios among people whose age is between 20 and 39; the data are available on the website of the Korean National Statistical Office. We define a person as college educated if he/she attended or has a degree from a 2-year or 4-year college.

We use the Korean marriage records, released as a part of "National Population and Fertility Survey." We regard a person as a marriage immigrant if he/she currently resides outside South Korea and his/her *bonjeok* is outside South Korea. A person's *bonjeok* roughly refers to the geographical location where the person is originally from and has

legal residency. For example, consider a woman who is in Seoul for temporary visit but has citizenship in China. In a Korean marriage record, her *bonjeok* is China while the location is her address in Seoul.

As for our micro-level analysis, we only use the marriage records for 2004 and 2005, although we could extend our sample to other years of marriage records for the following reasons. The Korean Statistical Office changed its classification of countries in 2004. Fewer than 10 categories of countries were used in marriage records prior to 2004, while marriage records from 2004 onward report the name of the country that a bride/groom resides in and has citizenship from. Importantly, some countries that sent a large number of women to Korea as brides (e.g., Vietnam and Philippines) were classified as "others" prior to 2004. Therefore, we choose marriage records from 2004 onward for comparability in some of our analyses (e.g., brides' characteristics depending on their home countries). We then limit our analysis to marriage records for 2004 and 2005 because our Japanese datasets are available up to 2005. Note that our empirical analyses, such as the characteristics of grooms who have a foreign bride, remain qualitatively the same when we extend our sample by, for example, including marriage records from 1998 to 2003.

2.3 Singapore

We use the Singaporean Population Census (2000 and 2010, Education of "Resident Non-student Population") to compute the educational attainment and sex ratio for individuals aged 20 to 39. Following the Census classification, we regard a person as having a college education if he/she has a diploma from a university, polytechnic, or an equivalent institution. To compute the fraction of singles depending on sex and tertiary education, we combine the population census and tables from "Population in Brief 2010" published by the Singapore Department of Statistics. "Population in Brief 2010" provides a table reporting the fraction of people who remain single depending on multiple levels of educational attainment, as of 1999 and 2009. We assume that the distribution of educational attainment in 1999 (2009) is the same as that in 2000 (2010). For each year, we then compute the fraction of singles among college educated men (women) and among non-college educated men (women). We refer to "Statistics on Marriages & Divorces 2009," published by the Singapore Department of Statistics in 2010, to report the

prevalence of cross-border marriages. We consider a person as a marriage immigrant if he/she did not have citizenship or permanent residency in Singapore but married a Singaporean citizen or permanent resident.

2.4 Taiwan

We use the statistics provided by Taiwanese Ministry of Education. Using the age- and sex-specific distribution of educational attainment, we compute the fraction of college educated among individuals whose age is between 20 and 39 and the sex ratio. We consider a person as having a tertiary education if he/she graduated from or attended a 2-year or 4-year college.

We use the tables from "Marriage Registrations," available from the Taiwanese National Statistics Bureau. Note that the Taiwanese government classifies a person as a "foreigner" if the person is neither overseas Taiwanese nor Chinese from Mainland China, Hong Kong, or Macao. In contrast, our paper considers a bride from Mainland China for example as a foreign bride (thus marriage immigrant to Taiwan). The information on the fraction of Taiwanese grooms/brides who have a spouse from a foreign country, as defined by the Taiwanese government, is available from 1998, but the fraction of Taiwanese grooms/brides who married Chinese from Mainland China, Hong Kong, or Macao is available from 2004.