

Beggar-Thy-Women:  
Domestic Responses to Foreign Bride Competition, the case of  
Taiwan \*

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## Abstract

In recent years, one in five marriages in Taiwan was to a foreign bride, mainly from China and Vietnam. In this paper we study the impact of foreign brides inflow on the domestic marriage market. We find that an inflow of foreign brides raises fertility and reduces the divorce risk of domestic couples. These results, we argue, are consistent with a model of marriage in which men employ women to produce children but women can shirk – the penalty of which is divorce. From the threat of foreign bride competition, women exert more effort, fertility increase and divorce risk declines. Our dataset consists of the universe of all marriages, divorces and the subsequent birth records between 1998-2006 in Taiwan. To address the endogeneity problem, we exploit a policy change in 2004 which restricts the entry of Chinese brides. We find that every 10 percentage points increase in foreign bride share increases local women's probability of having a child by 9.9 percentage points and decrease local women's probability of divorce by 0.79 percentage points.

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# 1 Introduction

In 1990, only 2 percent of newly married brides in Taiwan were foreign. By 2003, this number had risen to 29%.<sup>1</sup> This phenomenon is not isolated to Taiwan. In 2006, 10% of brides in South Korea and 5% of brides in Japan were foreign [Kamaguchi & Lee, 2012]. In the past decade, more than half a million women have married across border to wealthier East Asian Countries such as South Korea, Singapore and Taiwan. The phenomenon is likely to loom large in the future as China's 25 million surplus males come of age and China become wealthier.<sup>2</sup>

The foreign bride phenomenon has hardly gone unnoticed, yet the discussion has focused on documenting the scope and scale of the cross-border marriages, possible reasons for the phenomenon and the difficulties of assimilation facing foreign brides and their vulnerability to abuse [Hsia, 1997, 2006, Luoh, 2006, Kim, 2009, Kamaguchi & Lee, 2012]. The impact on domestic women, although possibly an unspoken reason for the unease in the receiving countries surrounding the phenomenon, has largely been ignored. Similar to the literature on the labor market impact of immigrants [Borjas, 2003a, Card, 2005], the influx of foreign brides could increase competition in the marriage market for domestic women. Assuming that women are on the supply and men on the demand side of the marriage market, an inflow of foreign brides might shift the supply of brides outward, reducing the market clearing price, thus resulting in a redistribution of welfare from domestic women (employees) to domestic men (employers).<sup>3</sup> Alternatively, foreign and domestic brides are poor substitutes – foreign brides marry men who would not marry otherwise – in which case, the impact of foreign brides on native women would be limited. A negative effect on native women of an inflow of foreign brides would be suggestive of a substitutability between domestic and foreign women as wives, and thus a redistributive effect of foreign women undercutting domestic ones.

Our study is closely related to two strands of research. First is the literature on immi-

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<sup>1</sup>During the same time period, the proportion of marriages with foreign grooms remains stable around 3%.

<sup>2</sup>[Das, n.d.] estimate that 25 million Chinese men would lack brides by 2030

<sup>3</sup>Empirically, Angrist [2002], Porter [2008], Francis [2011] and Edlund et al. [2008] found that higher marriage market sex ratios could raise women's bargaining power in marriage.

gration. Most of the economics of immigration literature have focused on examining the labor market competition caused by immigrants on domestic workers; however, immigrants can possibly displace natives in domestic labor market as well as marriage markets. Yet, unlike the immigration literature, where high-skilled workers and low-skilled immigrant workers may be complement, it is likely that foreign brides and domestic brides are substitutes.<sup>4</sup> To our knowledge, we are the first paper to examine the competition aspect of immigration in the marriage market. In our study, these immigrants are all women and their main purpose of immigration is marriage.<sup>5</sup> Another is the literature on marriage market and the household decision making. Works such as Chiappori *et al.* [2002], Choo & Siow [2006], Angrist [2002], Porter [2008], Lundberg & Pollak [1993], Francis [2011] and Edlund *et al.* [2008] examined the relationship between marriage market competition and intrahousehold bargaining power.

To draw the parallel between the international marriage migration and other immigration literature, we propose a principal-agent framework where, in marriage, women are producers of children and men are employers of women, and domestic and foreign women are substitutes. Fertility is uncertain and depending on women's unverifiable effort and a stochastic term. In return, in marriage, men provide resources to women. If the production of children is costly to women, women would have an incentive to shirk. Divorce may be a measure designed to punish shirking, triggered by low fertility (failure to bear children was the second of the seven ground for divorce in traditional Chinese family law. Incidentally, the Catholic Church's banning of divorce might have been a pro-female policy when formulated in the early years of the Church [Stark, 1997]). An influx of foreign brides could have two effects. Faced with a better alternative, men's divorce threshold could shift, triggering divorce at a higher fertility level. Faced with heightened risk of marriage termination, women might increase effort, resulting in a rightward shift in the fertility distribution. Whereas the net effect of divorce risk is ambiguous, the prediction for fertility is

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<sup>4</sup>See Borjas [1999]'s Handbook Chapter for review

<sup>5</sup>However, immigrants may be disproportionately male or female depending on the nature of immigration. For example, there are 800,000 more male than female immigrants between age 20 and age 45 in the US 2000 Census. These surplus male immigrants can possibly create pressure for native men in the marriage market. There are other works examining the assimilation and intermarriages of immigrants and natives such as work by Meng & Gregory [2005] or work by Angrist (2003) examines marriage market among various ethnic groups. We will discuss later how our paper is different from the existing works.

clear: fertility would increase. Extending this framework to allow for marriage markets to be segmented, it follows that the impact would be greatest where foreign brides are more substitutable for domestic ones. Assuming this to be the case for men at the bottom of the pile men who are least competitive in the domestic marriage market, such as the ones who are least educated or residing in the areas with high male-to-female sex ratio, would benefit the most from the influx of foreign brides, thus they would experience greater shift of divorce threshold. For a given married couple, the more the husband's divorce threshold shifts, the more children would be born as a result of foreign bride influx.<sup>6</sup>

It is empirically difficult to quantify the impact of foreign brides. Similar to the immigration literature, potential endogeneity mars attempts to causally link the inflow of foreign brides to outcomes in the receiving locality. For example, towns that are more discriminatory toward native women may have higher share of foreign brides, and thus a simple ordinary least square analysis might overstate negative effects of foreign bride share on domestic brides. Even if we had a panel dataset starting from the onset of the foreign bride phenomenon, variation across towns in the initial inflow of foreign brides is hardly random. Considering these difficulties, Taiwan may prove a particularly suitable setting for examining the impact of a globalizing marriage market for women in developed economies. Taiwan is one of the earliest East Asian countries importing foreign brides – the share of foreign brides in South Korea today is about at the level that Taiwan reached in 1997. While the other rich East Asian countries, i.e., Japan, Singapore and South Korea, observed a steady increase in the inflow of foreign brides in the past decade, in the late 2003, the Taiwanese government took measures to radically reduce the flow of foreign brides. Between 2003 and 2004, the share of foreign bride (FBS) among new marriages dropped by 25 percent nation-wide. This paper exploits this policy change. Another advantage of Taiwan is data availability. We have obtained government administrative records including the universe of marriage, divorce and birth registries covering the period 1998 to 2006. Using these registries, we can link all marriages that took places between 1998-2006 to their subsequent

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<sup>6</sup>A reason the bottom of the pile might view foreign brides as better substitutes for domestic women is that for them the reproduction function of marriage might take precedence over more culturally conditioned functions such as companionship or social climbing. One should also note that it is possible write a standard household model similar to the one in Akerlof *et al.* [1996] and arrive at the same prediction as our model.

fertility and divorce outcomes through 2006. The merged dataset contains information on brides' and grooms' birth date, education level, date of wedding, date of divorce, marriage history and place of residence, as well as detail birth records of their children born between 1996 and 2006.

Using this merged dataset, we link each couple's divorce and fertility record with township-level data on the sex ratio from the 2000 census and yearly inflow of foreign bride. The baseline sex ratio could proxy for the underlying demand for foreign brides. Our assumption is that the more skewed male-to-female ratio in 2000, the greater the shift of husband's divorce threshold due to the increase of foreign brides inflow. Therefore, these are areas that would be most affected by the 2003 policy. The main identification strategy we pursue is the difference-in-differences method. We compare fertility rate and divorce rate among native couples before and after the 2003 policy. The exposure of a couple to the change of policy was determined by the shift of husband's divorce threshold (proxied by baseline sex ratio). Our prediction is that a couple living in high skewed male-to-female ratio town would be affected more by the policy than a couple living in a town with lower male-to-female ratio. After controlling for township and year fixed effects and township-specific time trends, interactions between the township-level sex ratio and the dummy indicating whether it is after 2003 are plausibly exogenous. We find that native couples in areas with with more skewed sex ratio are less likely to have kids and more likely to get divorce after 2003 relative to couples in areas with low sex ratio. We also find this impact to be greater among those who are least educated. When we use duration analysis to estimate the probability of having a kid and probability of divorce, we also find patterns similar to the findings of linear probability model. Lastly, we conduct 2 stage-least-square (2SLS) analysis. We are interested in the impact of foreign bride share from the last period at township level on the divorce and fertility rates in this period. In the first stage, we use the timing of policy interacting with the township-level sex ratio as an instrument for foreign bride share. The estimates suggest that for every 10 percentage point increase in inflow of foreign bride share increases the probability of fertility by 9.9 percentage points and decreases the probability of divorce 0.79 percentage points.

The remainder of this paper is structured as follows: Section 2 discusses background

and existing literature on foreign brides. Section 3 makes a theoretical case for increased competition leading to higher fertility among domestic women and, possibly, changes to divorce rates. Section 4 describes the data, Section 5 presents the specification for regression analysis and discusses the results, and Section 6 concludes.

## 2 Background and Literature Review

### 2.1 Background

When Mao Zedong and the Peoples Liberation Army defeated Chiang Kai-shek in 1949, Chiang Kai-shek, Taiwan along with 600,000 soldiers and half a million civilians, were forced to flee from China to Taiwan. Among the population that migrated, men outnumbered women by a factor of 4 to 1 Francis [2011]. Government does not permit these soldiers to retire and marry until they were able to conscript enough native Taiwanese to replace them which only started in 1956. Given skewed male-to-female sex ratio, some of these veterans start to seek spouses in Southeast Asia in the 1970s Hsia [1997]. These cross-border marriages were uncommon then and had been relying on individual connection in finding a bride abroad.

During the 1980s and 1990s, Taiwan's economy was growing rapidly, especially relative to some of its Southeast Asian neighbors. By 1990, GDP per capita of Taiwan was 19 times higher than China's, 10 times higher than Indonesia's and 22 times higher than that of Vietnam. With the Taiwanese government's policy encouraging investment in Southeast Asia in the early 1990s, Taiwanese businessmen first went to Vietnam and Indonesia to seek cheap labor, but they also saw the opportunities of providing marriage brokerage service – introducing women from these less developed countries to Taiwanese men [Jiang & Huang, 2004]. In 1992, Taiwanese government lifted the restriction on Chinese brides from entering Taiwan, the marriage brokerage business then expanded their business to China.

These brokers charge a lump sum of between USD 7,000-10,000 from the prospective groom [zen Wang & ming Chang, 2002],<sup>7</sup> The brokers would take care of the entire process, including arranging the grooms' trip abroad and their meeting with a number of potential

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<sup>7</sup>The average wedding in Taiwan costs USD 26,000, which is more than annual per capita income and is usually paid by groom.

brides. Once a groom chooses his bride, the broker would arrange a wedding banquet in the bride's hometown, prepare all documents for the bride's visa application and arrange the trip to Taiwan for the chosen bride. The entire process takes less than a week for the groom, while the brides often have to wait for a couple months before they receive the proper visa to enter Taiwan.<sup>8</sup> According to the Survey Report of the *2002 Living Conditions of Foreign and Mainland Spouses* produced by the Taiwanese government with data collecting from 175,000 foreign spouses, 37.8% of all Southeast Asian brides (excluding brides from mainland China) were introduced to their spouses via commercial marriage brokers and 46% met through friends and relatives [gov, n.d.].<sup>9</sup> Table 1 describes the composition of foreign brides by country of origin. China, Vietnam and Indonesia are among the largest bride exporting countries. Why would these foreign brides want to marry abroad? According to a survey done in 2004 in Vietnam of 650 households with one or more daughters married to Taiwanese men, the overwhelming reason is material gain. Nearly 80% of households cite to help the family, "for a better life" or to make parents happy as their main reason.<sup>10</sup> The Vietnamese brides' family receive USD1,000-2,000 at the time of the wedding and as well as later remittances [zen Wang & ming Chang, 2002].<sup>11</sup>

Figure 1 shows the foreign bride share of all newlyweds over time broken down by Chinese and Southeast Asian brides. Foreign brides started entering Taiwan in the mid-1990s. By the time our dataset begins in 1998, 10% of newlyweds are Chinese brides and 6% of new marriages are Southeast Asian brides. This increasing trend continues until 2003. On September 1, 2003 the Taiwanese government began a more stringent screening of all newly married Chinese spouses wanting to enter Taiwan. Prior to the policy, Chinese spouses only need to provide a valid marriage certificate. After the implementation of the policy, brides from China are required to be interviewed three times: prior to entering Taiwan, once at the port of entry, and on entry, once at the place of residence. Brides

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<sup>8</sup>For more in depth report on the process of bride selection see zen Wang & ming Chang [2002].

<sup>9</sup>The high share of foreign brides being introduced through friends and relatives have two implications. First is that a high share of foreign brides do prefer their foreign marriage arrangement over staying in their home countries, so that they would introduce their friends and families to marry a Taiwanese man. Second, this is parallel to the findings in the immigration literature where new immigrants could benefit from the existing network of immigrants in the host countries [?].

<sup>10</sup>We should also note that according to the report, there are no cases where parents have sold their daughters to the brokers [?].

<sup>11</sup>nominal GDP per capita in 2011 was USD 1,400.



could be refused entry or be repatriated immediately if the marriage is deemed bogus [Wu, n.d., Lu, 2008].<sup>12</sup> Whether a Chinese bride could come to Taiwan becomes arbitrary and solely depend on the interviewers.<sup>13</sup> This new rule implicitly increases the cost of marrying Chinese brides and such marriages drop sharply following the policy.<sup>14</sup> Figure 2 shows the numbers of Chinese brides and of all newlyweds over time broken down by Chinese and Southeast Asian brides. It is evident that the policy was well enforced since we observe a dramatic decline of Chinese brides starting in winter 2003. On the other hand, the numbers of Southeast Asian brides were rather unaffected in 2004 indicating that the Chinese brides and Southeast Asian brides are imperfect substitutes. We also observe a small decline in Southeast Asian brides in 2005 due to a new rule imposed by the Taiwanese embassy in Vietnam. The embassy used to process hundreds of marriage visa applications per day. However, starting in Jan 2005, a one-on-one interview requirement for all marriage visa applications was introduced limiting the number of marriage application a day to 20-30 (Dajiyuan News, 2005). These changes combined lead to the closure of many marriage brokerage firms.

## 2.2 Existing Literature

The foreign bride phenomenon in Taiwan has been widely studied since early work by Hsia [1997]. However, most of it has been ethnographic in nature, limited in scale and scope, and few have been published in peer-reviewed journals. Therefore, in this section, we only discuss the few articles that have drawn on large-scale data sets and thus are closest to our paper.

Tsay [2005] provided an overview of the trends of the foreign bride phenomenon from 1991 to 2003 in Taiwan. Drawing on aggregate-level datasets provided by the central government, he describes the increasing trend, the country-composition of foreign brides and

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<sup>12</sup> Announced on August 28, 2003 by the Immigration Office, Ministry of Interior, and published on the front page of the China Times, the Liberty Times and the United Daily Newspaper on August 29, 2003

<sup>13</sup> According to Wu [n.d.], nearly 10% of Chinese brides were turned away in the first four months of the implementation of policy

<sup>14</sup> Lu [2008] suggests that one of the main reason why the policy was implemented is due to the negative media attention surrounding several crackdowns on prostitution rings that consisted mostly of Chinese brides. Chang [2002] estimated that a total of 1,800 Chinese brides have been convicted of prostitution. Yet, the scale of this problem does not seem large when one considers that there were more than 300,000 foreign brides in Taiwan during this time period.

settlement patterns. His paper is one of the first to identify the regional variation in the demand and supply of brides. Luoh [2006] took the analysis one step further by combining the Labor Force Participation survey with the 2000 Census survey to examine the relationship between the groom's education level and the likelihood of marrying a foreign bride. He found that foreign brides have disproportionately married grooms of lower education, and more than 50% of the men who have received less than a middle school education have married a foreign bride. He also found that foreign brides are disproportionately located in the South (such as Ponghu, Chiayi and Nantou Counties) while the more developed counties (such as Taipei and Taichung City) had very few foreign brides.

Liaw *et al.* [2011] provided a descriptive study of the fertility of foreign and domestic brides using the 2003 Survey of Foreign and Mainland Spouses' Life Status. The 2003 Survey is meant to be a census of all family with foreign spouse in Taiwan. However, the attrition of the survey is non-negligible and likely non-random. They estimated the lifetime total fertility of foreign women at 1.58 children.

The main focus of their paper was to examine determinants of fertility. However, unlike our paper, they do not examine the health of the newborn. We exploit the advantage of our dataset in that it contains birth weight information, which allows us to examine the health of babies born to foreign versus Taiwanese mothers.

Kamaguchi & Lee [2012] examined the foreign bride phenomenon across South Korea, Taiwan, Singapore and Japan. They focussed mainly on the reasons for men in these rich countries sought brides from substantially poorer countries instead of marrying their fellow country women. They point to improvements in women's educational attainment and a low marriage surplus for educated women. The potential tension between women's education and willingness to marry is an issue of long standing that in the West has been resolved in favor of a radical shift in gender roles allowing women to combine marriage and work.

The impact on domestic women of foreign brides has not entirely been ignored however. In the study closest to ours, Tsai *et al.* [2010] looked at foreign brides and out-of-wedlock fertility among Taiwanese women. They used the 1990 and 2000 Census along with the birth registries. Their study provides suggestive evidence of a link but fall short of plausibly establish causality.

Lastly, the spirit of our work also parallels that of Card [1990] and Borjas [2003b] who examined whether immigrant workers displace domestic workers.

### 3 Model

Consider the following principal-agent inspired model. Assuming that each marriage lasts two periods and women can produce children, but fertility is uncertain and depends positively on the woman's unverifiable effort  $e = \{0, 1\}$ , as well as a stochastic term. We let the density distribution of fertility  $\phi$ , given  $e$  be denoted by  $f(\phi|e)$ , where  $f(\phi|1)$  stochastically dominates  $f(\phi|0)$ . We let  $F(\phi|e)$  denote the cumulative distribution of fertility, and let  $\alpha_x^e = F(\phi_x|e)$ . This is illustrated in Figure 3.

For simplicity we will let women's cost of effort be captured by a positive marginal cost of children – higher effort leading to more children in expectation, and higher cost.

Both men and women have positive but decreasing marginal utility from children. Through marriage, men obtain the children borne by their wives.<sup>15</sup> We assume that men's cost for children is a per period cost, and it is smaller than women's cost for children. These cost asymmetries can be motivated by the structure of reproduction and marriage. For now, however, suffice it to note that the different cost structures may introduce gender differences in the desired number of children born in marriage, with men preferring more children than women. Furthermore, we assume that the net utility (utility from children minus the cost of children) from children is not enough to make women self motivated.

We let the marriage contract stipulate a per period payment from man to the woman against children produced in the marriage. If period 1 fertility is below a certain level  $\phi_0$ , the marriage is dissolved, and the second period payment is forfeited. The level of  $\phi_0$  is dictated by man's utility level outside of marriages.

The second period decision is trivial: women will exert zero effort. We focus on women's first period decision. Moreover, we assume that women face increasing marginal cost of fertility, resulting in the standard upward sloping supply curve.

Thus, shirking  $e = 0$  could affect women negatively in two ways: it reduces her expected

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<sup>15</sup>For an overview of the legal and biological aspect of reproduction underpinning the basic setup of our model, see Edlund [2006].

fertility and it increases the probability of being divorced. On the other hand, shirking increases her period 1 surplus (marriage payment minus cost of realized children). Therefore, women's effort level would be determined by the marriage payment, the cost of children, utility if divorced and the probability of being divorced.<sup>16</sup> Let us denote by  $\alpha^*$  the probability of divorce beyond which low effort yields lower expected utility for the woman than high effort.

Foreign brides are assumed low cost providers of children and thus their presence make divorce more attractive for men.<sup>17</sup> In our model, this amounts to a rightward shift of the fertility threshold that triggers divorce:  $\phi_0 \rightarrow \phi_1, \phi_0 < \phi_1$ , (illustrated in Figure 4) and thus an increase in divorce risk at  $e = 0$  from  $\alpha_0^0$  to  $\alpha_1^0$ . In case  $\alpha_1^0 > \alpha^*$ , the influx of foreign brides would induce domestic women to exert more effort and as a result, a shift in the fertility density function from  $f(\phi|e = 0)$  to  $f(\phi|e = 1)$  (illustrated in Figure 5). The presence of foreign brides changes the divorce risk to  $\alpha_1^1 < \alpha_1^0$ , and it is possible that  $\alpha_1^1 < \alpha_0^0$  (illustrated in Figure 6).

One extension of the model is that some men may experience a larger shift in fertility threshold as a result of influx of foreign brides than others. In particular, those men who would have a difficult time in the marriage market would have most to gain with the foreign brides inflow. Therefore, we expect the fertility of those who are least educated to be affected more than those who are better educated. We also expect those who live in the areas with higher male-female sex ratio to be affected more than those who live in areas with lower male-female sex ratio. We are going to test these predictions in Section 5.

## 4 Data

The datasets used in this paper are compiled using several administrative records from Taiwan, including marriage, divorce and births records between 1998 and 2006. The marriage

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<sup>16</sup>One can easily apply Shapiro & Stiglitz [1984]'s model on shirking in this framework. Essentially women would shirk if and only if utility gain from shirking is greater than the disutility associated with negative consequences of shirking. Men could have offered an efficiency wage so that women would exert full effort and do not shirk. For simplicity, we can assume that it is too costly for men to offer such a high wage.

<sup>17</sup>Their presence could also make divorce less attractive for women since women would have a lower chance to be hired after divorce, and it should arrive at the same prediction. For the simplicity of our model we would leave out this point.

registries contains all registered marriages that took place between 1998 and 2006 for both domestic and foreign brides. For each marriage record, information on education, date of birth, country of origin, residential addresses and marriage history of both the bride and groom are linked. The residential address enables us to impute the share of foreign brides among all newlyweds for each year and township between 1998 and 2006. We will refer to this flow measure as the foreign bride share (FBS) hereafter. The birth registry contains information on sex, birth weight, gestation period, birth order, birth place and infant mortality and we merge it with the marriage registry. Therefore, for each couple married between 1998 and 2006 we have information of their subsequent fertility and divorce record.

#### 4.1 Descriptive Statistics – Marriage

Table 2 provides a summary statistics of couples' characteristics broken down by the brides' origins for those who married in 1998. First noteworthy point is that the age gaps between brides and grooms are much wider for Southeast Asian brides and Mainland Chinese brides (approximately 11-14 years in age difference), compared to Taiwanese brides. Not only are foreign brides younger than local Taiwanese brides but their husbands are much older as well. Another point of interest is education: grooms who marry Mainland Chinese or Southeast Asian brides are much less educated. Moreover, grooms who marry Chinese brides are less educated than those who marry Southeast Asian brides, possibly due to the greater language barrier in the latter case. Most of the Southeast Asian brides do not speak Mandarin, the official language in Taiwan and China. Conditional on reporting, the education levels of Mainland Chinese brides are similar to those of the Taiwanese brides, and Southeast Asian Brides receive less education compared to Taiwanese and Chinese brides.<sup>18</sup> Comparing the health of newborns, those of newborns of foreign brides are healthier than newborn of Taiwanese brides as measured by birth weight and infant mortality. Among Taiwanese couples who married in 1998, 17% of them divorced by 2006 and the divorce rates were even higher for foreign brides.

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<sup>18</sup>30% of Southeast Asian brides and 45% of Chinese brides did not report their education level, whereas only less than 0.2% of Taiwanese brides did not report their education level. Kamaguchi & Lee [2012] find that foreign brides in Japan and Korea are more educated than the average woman of their birth cohort and country. Conditional on having non-missing education level, we find similar pattern for foreign brides in Taiwan.

Likewise, Figure 7 breaks down the FBS by grooms' age. It is most common for an older groom (age 50 or above) to marry a foreign bride. The oldest grooms, 50 plus, are the most likely to marry a bride from China whereas the percentage of grooms who marry Southeast Asian brides peak between age 40 and 45. Figure 8 breaks down the share of grooms marrying foreign brides by groom's level of education. It is clear that the likelihood of marrying a foreign bride decreases with greater education attainment. More than half of the grooms with only elementary school education married either a Chinese or a Southeast Asian brides, whereas grooms with a college degree or more predominantly marry fellow country women.

The evidence so far does not allow us to determine the impact of foreign brides on Taiwanese women. For example, if the domestic marriage market and foreign marriage markets are completely segregated, if there is no substitution between Taiwanese women and foreign brides for Taiwanese men, or if only the undesirable Taiwanese men would marry a foreign bride. However, Figure 9 presents share of foreign brides by groom's marriage history – whether the grooms have been divorced or not. We find that divorcés are much more likely to marry a foreign bride than those who have never married. Divorcés are also much more likely to marry a Chinese bride than a Southeast Asian bride. While the role of the possibility to remarry a foreign wife in the break up of the preceding marriage can only be a matter of speculations, this statistic is suggest evidence that foreign brides affect Taiwanese women. In the next section we turn our attention to this issue. In particular, is there evidence of foreign brides affecting the power balance among domestic couples?

## 5 Empirical Analysis

Following the prediction of the conceptual framework, we examine two outcome variables – fertility and divorce of local couples. One specification that we can pursue is the following:

$$I(\textit{Fertility})_{ivt} = \beta + \gamma_0 FBS_{v(t-1)} + \gamma_1 X_{it} + \tau_t + \pi_v + \epsilon_i. \quad (1)$$

$$I(\textit{Divorce})_{ivt} = \beta + \gamma_0 FBS_{v(t-1)} + \gamma_1 X_{it} + \tau_t + \pi_v + \epsilon_i. \quad (2)$$

where  $X_{it}$  represents couple's characteristics including groom's age, groom's education, duration of marriage, a dummy variable indicating whether they never had a son and a dummy indicating they ever had a daughter for couple  $i$  in township  $v$  at year  $t$ .  $I(FBS)_{v(t-1)}$  is the share of foreign bride among newlyweds in year  $(t-1)$  at township  $v$ .  $\tau_t$  captures the year fixed effect while  $\pi_v$  captures township fixed effect. We use the flow (rather than the stock) of foreign brides to capture the potential competition of foreign brides, since the flow could better reflect both the existing norm in the area, as well as the administrative difficulties of importing brides to that region. For example, after the policy changes in 2003, it was more difficult to import a foreign bride, thus according to our model, (Taiwanese) women should feel less threatened. Yet this change of legal environment and the change of the cost of foreign brides, would not be captured by the stock of foreign brides. In addition, we decided to use the flow from the previous year since a change in decision to have a child and to file divorce would not be reflected immediately.

However, as we have previously discussed, the coefficient  $\gamma$  from Equation 1 and Equation 2 could be biased since a town's foreign bride share,  $FBS_{v(t-1)}$ , could be correlated with error terms.<sup>19</sup> To address endogeneity problems, we use a policy implemented in September 2003, which made it more difficult for Chinese brides to enter Taiwan. All Chinese brides are now interviewed at the customs, and they can be denied entry to Taiwan if the border controls deem their marriage as invalid. It is evident in Figure 2 a sharp drop of Chinese brides starting in Fall 2003. Similar policy also expanded to Vietnamese brides in early 2005, so we can observe the declining trend of both Chinese and Southeast Asian brides.

As discussed in the model section, we expect this policy to have more impact on those who reside in areas with higher sex ratios (males to females). Therefore, we divide population into 4 quartiles depending on the sex ratio between age 20-45 in their township. Fourth quartiles are those with the highest male to female ratio. Figure 10 presents foreign bride share by quartile for each year compared to 2003, which is the peak of foreign bride

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<sup>19</sup>When we calculate FBS, for those residing in metropolitan areas, the sex ratio is aggregated to the entire metropolitan level. Since township in metropolitan area is defined as blocks (similar to a US census tract). For example, Taipei city, which is no larger than Manhattan, has 12 blocks. Thus, the local marriage market in a metropolitan area extends far beyond the block.

inflow. Fourth quartile, those who reside in the most skewed sex ratio, has the sharpest decline in foreign bride ratio post 2003 policy.

We first use a difference-in-differences approach to examine whether the direction of the impact is as our model has predicted. The following equation is estimated:

$$I(Fertility)_{ivt} = \beta + \gamma Treat \times SexRatioQ_{vt} + Treat_t + SexRatioQ_v + \delta X_{it} + \tau_t + \pi_v + \epsilon_i, \quad (3)$$

and

$$I(Divorce)_{ivt} = \beta + \gamma Treat \times SexRatioQ_{vt} + Treat_t + SexRatioQ_v + \delta X_{it} + \tau_t + \pi_v + \epsilon_i, \quad (4)$$

where  $I(Fertility)_{ivt}$  is an indicator variable of whether couple  $i$  in township  $v$  at time  $t$  had a child or not.  $I(Divorce)_{ivt}$  is an indicator variable of whether couple  $i$  in township  $v$  at time  $t$  divorced or not.  $Treat$  is a dummy variable indicating whether it is post-2003 policy or not. The coefficient on  $Treat$ ,  $\gamma$  reflects not only the change in divorce caused by the policy but also any other contemporaneous factors that influences fertility. Sex ratios are imputed at the township-level for those between age 25-44 in 2000 and we divide villages into quartiles by sex ratio. The villages in the fourth quartile are those with the most male sex ratios ( $\approx 1.4$ ), and the first quartile includes those villages with the least male sex ratios ( $\approx 0.7$ ). The main coefficient of interest is  $\gamma$ , which captures the heterogeneous impact of the 2003 policy on the likelihood of divorce and fertility across townships. We restrict the sample to those married women whose age is between 18 and 50. Here, the key assumption is that the trend of divorce/fertility is similar in areas with high and low sex ratios.

Given that the policy change took place in September 2003, we first restrict our sample to examine the fertility outcomes in 2003 and 2005. We exclude outcomes in 2004 for the following reasons: first, the fertility outcome would not respond to the policy immediately. Second, it may take a few months for information about the policy to spread. Throughout the analysis, we also restrict the sample to those who married prior to 2003, since the couples who married post policy could be different in unobserved characteristics from couples married before the policy. The results are presented in Column 1 of Table 3. Next,



we include all divorce outcomes from 2000 to 2006, excluding 2004. Standard errors are clustered at the township level throughout the analysis. We find that women who live in areas with a more male sex ratio are less likely to give birth after the implementation of the policy, and the difference across quartiles are statistically significant at 1% level. While the direction of the impact is what our model has predicted in Section 5.1, we can not completely rule out the possibility that there were other contemporaneous policies/changes that could have reduced the fertility in a similar pattern. Therefore, to further push the hypothesis that foreign bride flows affect domestic bride's fertility, we separate the sample by groom education. Men who are in high demand in the domestic marriage market (here, better educated) would not be as affected by the policy compared to those who are in lower demand. In Columns 3 to 5, we divide the sample by husband's education level: illiterate to completing 8th grade in Column 3, completing middle school to some college in Column 4, and last, a bachelor or higher degree in Column 5. The policy has the most impact on the men who are of lowest education level.<sup>20</sup>

In Table 4, we have same setup as Equation, but control for county-specific time trends, and we find similar results. Table 5 we present a set of robustness checks. In Column 1, we control for township-specific time trend. Column 2 includes county-year fixed effects. We are worried that the results are mostly driven by the metropolitan areas, so we drop two of the largest cities. Column 4 we restrict to examine the outcomes in 2002/2003/2005/2006. Sex ratio quartiles has been defined at the individual level—meaning that there are equal share of population in each of the quartile. Here we define sex ratio quartiles at the township level in Column 5. Throughout different specifications, we find very similar results that those women in areas with most skewed sex ratio would be having fewer children after the 2003 policy. In Columns 6 and 7, we present two sets of falsification tests. In Column 6, we assume that the policy took place in 2002 and compare the fertility outcomes in 2001 and 2003; Column 7 assumes that the policy took place in 2001 to fertility outcome in 2000 and 2002. In neither specifications, we do not find the pattern that was shown in Tables 3

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<sup>20</sup>In Appendix, we offer an alternative specification. In these tables, sex ratio quartile is currently defined at the township level, then we merge it to individual level data. Since metropolitan areas have lowest sex ratio and most population, there are a lot more observations in the first quartiles than in the fourth quartile. In the alternative specification, sex ratio quartile is redefined after individual data is linked to township-level sex ratio, so each quartile would have roughly a quarter of the total observations.

and 4.

Next we examine the divorce outcome. In Column 1, we include all years but those in 2004. We find that after the policy, couples are more likely to divorce if they live in areas with high sex ratio relative to areas with low sex ratio. In Columns 2 to 4, we investigate the impact by husband’s education level: illiterate to completing 8th grade in Column 2, 9th grade to some college in Column 3, and having a bachelor or higher degree in Column 4. As expected, most of the variations in divorce are only driven by the least educated.

The specifications so far assume that the error terms are uncorrelated across time period. Since we can compute the duration to next birth, hazard models provide another natural econometric framework. A hazard function indicates the probability of a birth (divorce) in period  $t$ , conditional on no birth (divorce) at time  $t - 1$ . To allow the hazard to be time dependent, we use a Weibull baseline hazard specification. The coefficients are reported in Table 7.<sup>21</sup> The coefficients indicate that in the highest sex ratio areas, couples are 22% less likely to have a child at any given time relative to an area with the least male sex ratio after the policy is adopted. Those who live in areas with less male sex ratios exhibit similar patterns, only the magnitude is much smaller.

## 5.1 2SLS

In the previous section, we examined the reduced-form impact of the policy. While the difference-in-difference result is informative in showing us the direction of model prediction, it is difficult to quantify the magnitude of the impact. Alternatively, we can perform two stage-least square as follows:

$$FBS_{vt-1} = Treat_{t-1} + Treat_{t-1} \times SexRatio_{Qv} + \tau_t + \pi_v \epsilon_i, \quad (5)$$

$$I(Fertility_{iwt}) = \beta + \gamma(\widehat{FBS})_{v(t-1)} + \delta X_{it-1} + Treat_{t-1} + \tau_t + \pi_v \epsilon_i. \quad (6)$$

The share of foreign brides for township  $v$  at time  $t - 1$ ,  $(FBS)_{v(t-1)}$ , can be captured by the underlying time-invariant demand of foreign bride at the township-level,  $\pi_v$ , the year-

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<sup>21</sup>We randomly select 40 % of the total sample to expedite the speed of estimation.

specific demand  $\tau_t$ , , and the intensity of the policy proxied by  $Treat_t - 1 \times SexRatio_v$ . While the policy is national, we would expect it to have a greater impact in areas with more male sex ratios. A concern is that the contemporaneous sex ratio is affected by the influx of foreign brides. Therefore, we use the baseline sex ratio measured in 2000. The key identification assumption is that the treatment intensity of the policy would have no direct impact on divorce/fertility once we control for township fixed effects and year fixed effects.

Table 7 presents the first stage results. The dependent variable is the flow share of foreign bride, and we divide sex ratio by quartiles and interact them with the policy. The signs on the interaction terms are as expected, suggesting that places with more male sex ratio experience a larger drop in foreign bride share after the policy.

Table 8 reports the 2SLS results estimating the impact of foreign bride ratio on fertility and divorce. Column 1 includes all observations while Columns 2-4 each represent results by the groom’s education level. Panel A presents fertility outcomes and Panel B divorce outcomes. The results in Column 1 indicates when the foreign bride share increases from 0 to 10 percentage point, the probability of having a child among local married women increase by 9.9 percentage points, and the probability of divorce would decrease by 0.79 percentage points. We should also consider that the impact on fertility is large and important considering as this is a country with fertility below replacement level.

## 6 Conclusion

This paper describes a new migration phenomenon—the influx of foreign brides— that is becoming more popular in many parts of Asia including China, Singapore, Taiwan and South Korea. We use datasets from Taiwan to examine the type of men who married foreign brides, and our findings suggest that foreign brides are more likely to marry to less educated and older husbands. In addition, we examine the impact of the foreign bride influx on Taiwanese married women. Our model predicts that the influx of foreign brides could create divorce pressure for local women and thus increase their fertility. The empirical results are consistent with the model prediction.

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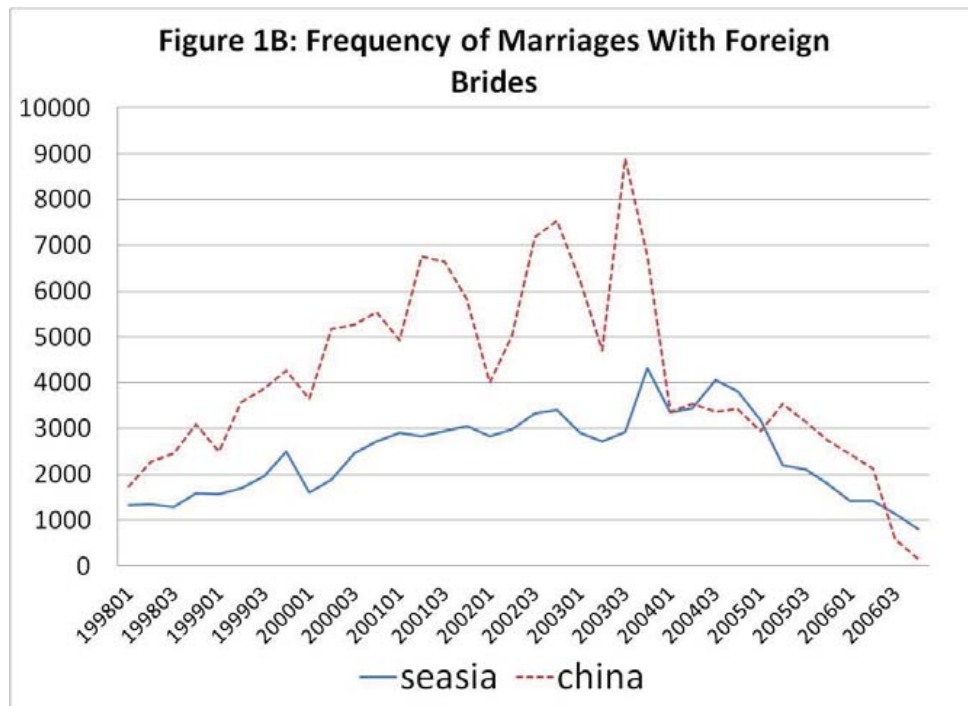
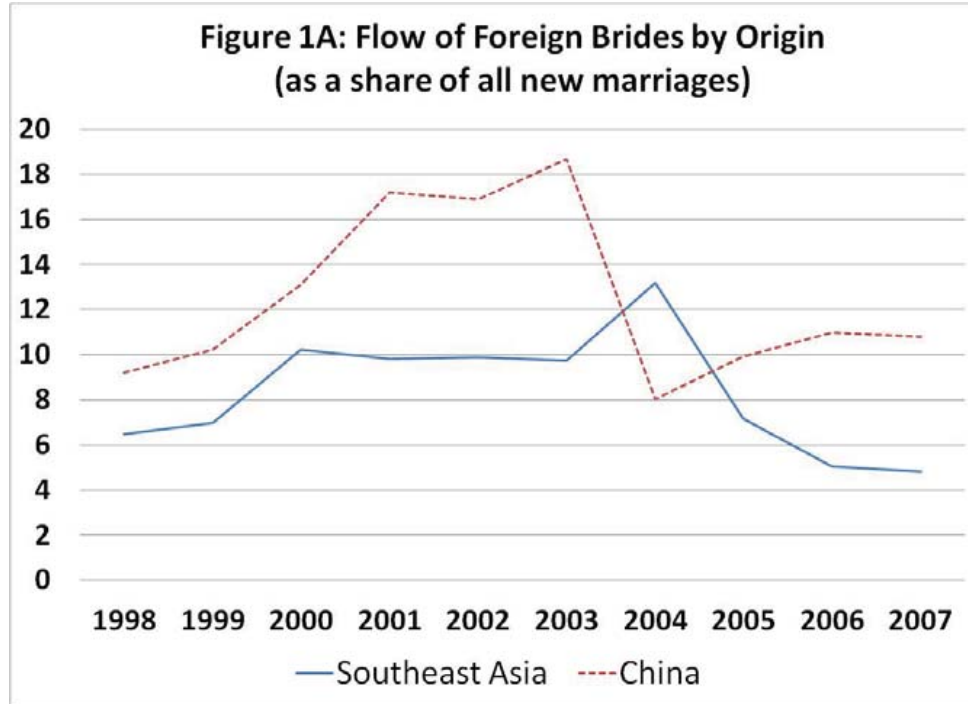
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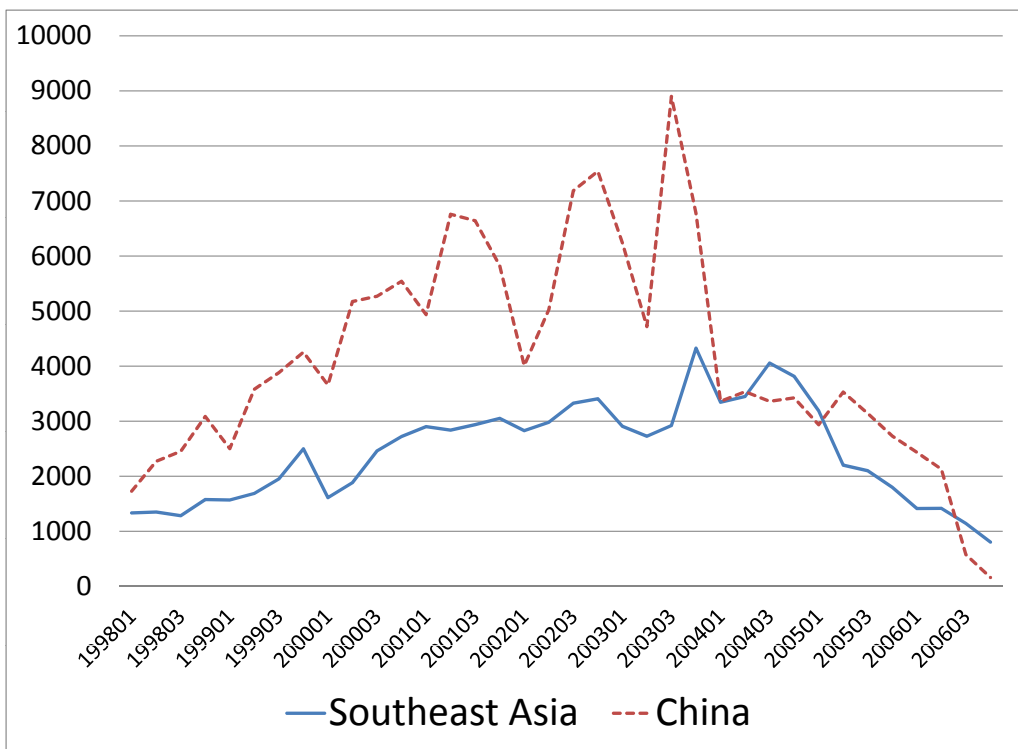
**Figure 1:** Flow of Foreign Brides by Origin Over Time(as a share of newlyweds)

Figure 1



**Notes:** This figure is compiled using government marriage registries. It shows the share of foreign brides of all newlyweds in a given year. China include Macao, Hong Kong and mainland China. Southeast Asia include Vietnam, Indonesia, Malaysia, Thailand, Cambodia, Singapore, Philippine and Laos.

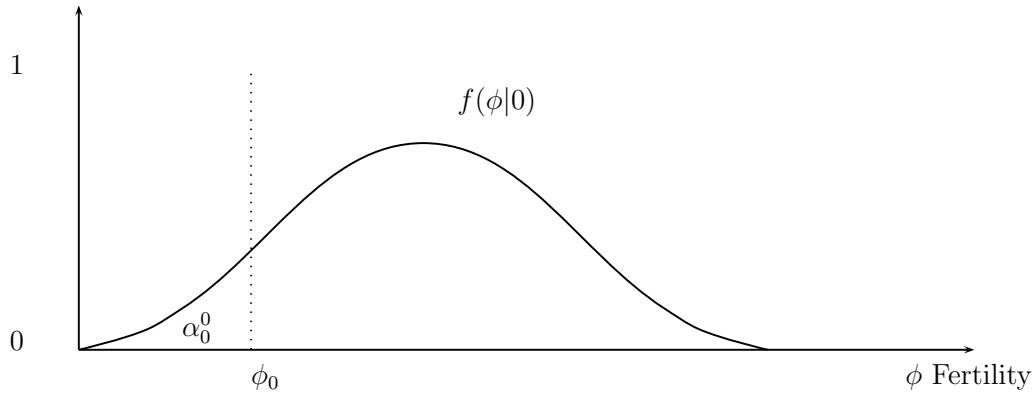
**Figure 2:** Frequency of Marriages with Foreign Brides by Origin Over Time



**Notes:** This figure is compiled using government marriage registries. It shows the number of new foreign brides in a given quarter-year. China include Macao, Hong Kong and mainland China. Southeast Asia include Vietnam, Indonesia, Malaysia, Thailand, Cambodia, Singapore, Philippine and Laos.

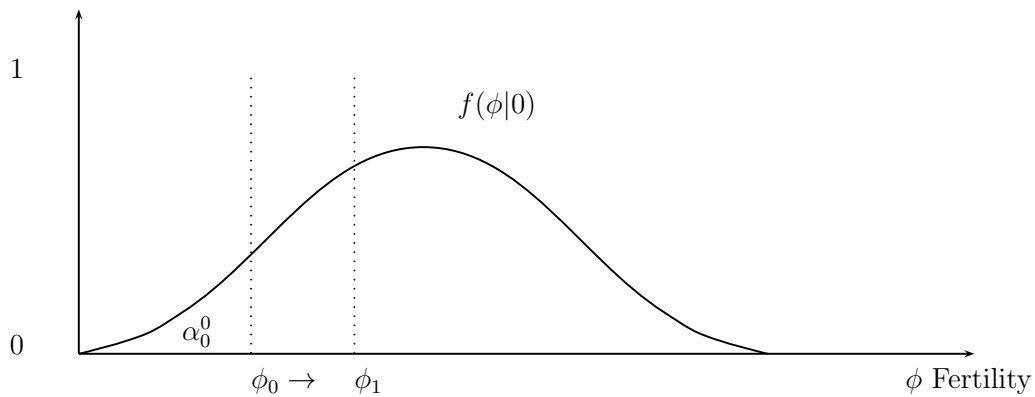


**Figure 3:** Probability Density Function of Fertility Outcome When Women Exert No Effort



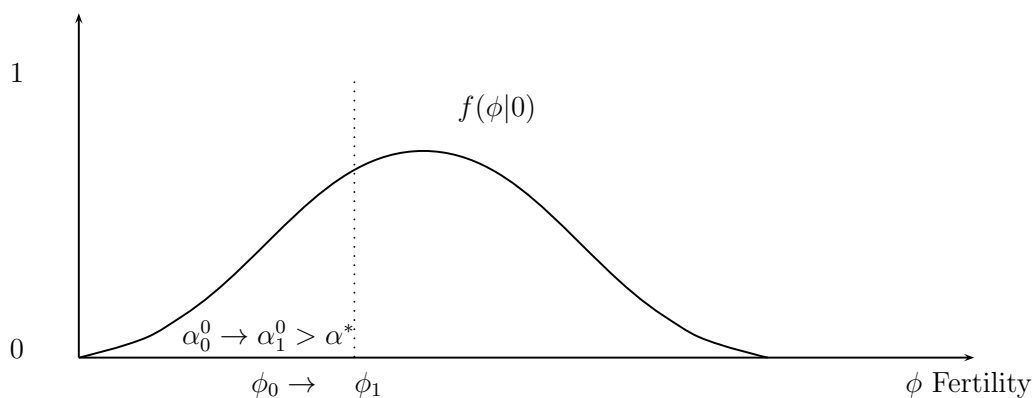
Notes: We let the density distribution of fertility  $\phi$ , given  $e$  be denoted by  $f(\phi|e)$ . We let  $F(\phi|e)$  denote the cumulative distribution of fertility, and let  $\alpha_x^e = F(\phi_x|e)$ .  $\phi_0$  indicates men's threshold, below which the marriage would dissolve. The level of  $\phi_0$  is dictated by man's utility level outside of marriages.  $\alpha_0^0$  indicates the probability of divorce at the baseline when women exert no effort.

**Figure 4:** Shift of Divorce Threshold Due to Influx of Foreign Brides



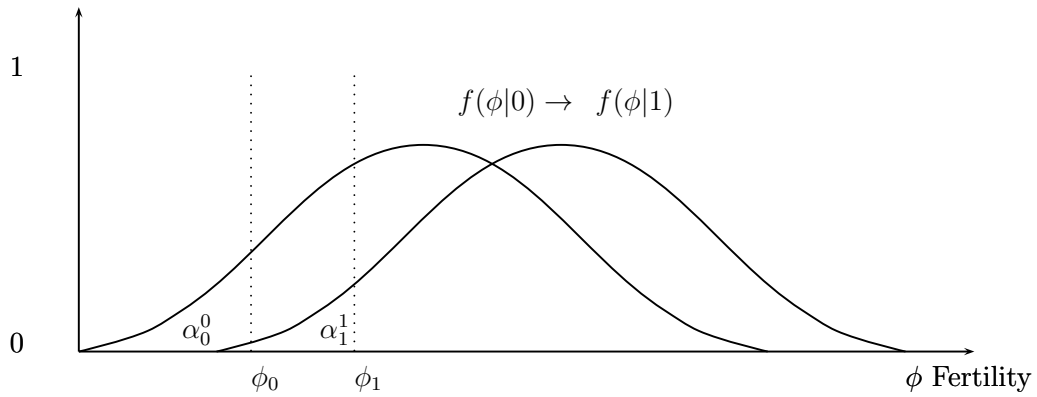
Notes: We let the density distribution of fertility  $\phi$ , given  $e$  be denoted by  $f(\phi|e)$ . We let  $F(\phi|e)$  denote the cumulative distribution of fertility, and let  $\alpha_x^e = F(\phi_x|e)$ .  $\phi_0$  indicates men's initial threshold, below which the marriage would dissolve. The level of  $\phi_0$  is dictated by man's utility level outside of marriages at the baseline when there is no foreign bride.  $\phi_1$  indicates men's new threshold with the influx of foreign brides

**Figure 5:** Overall Impact of Influx of Foreign Bride



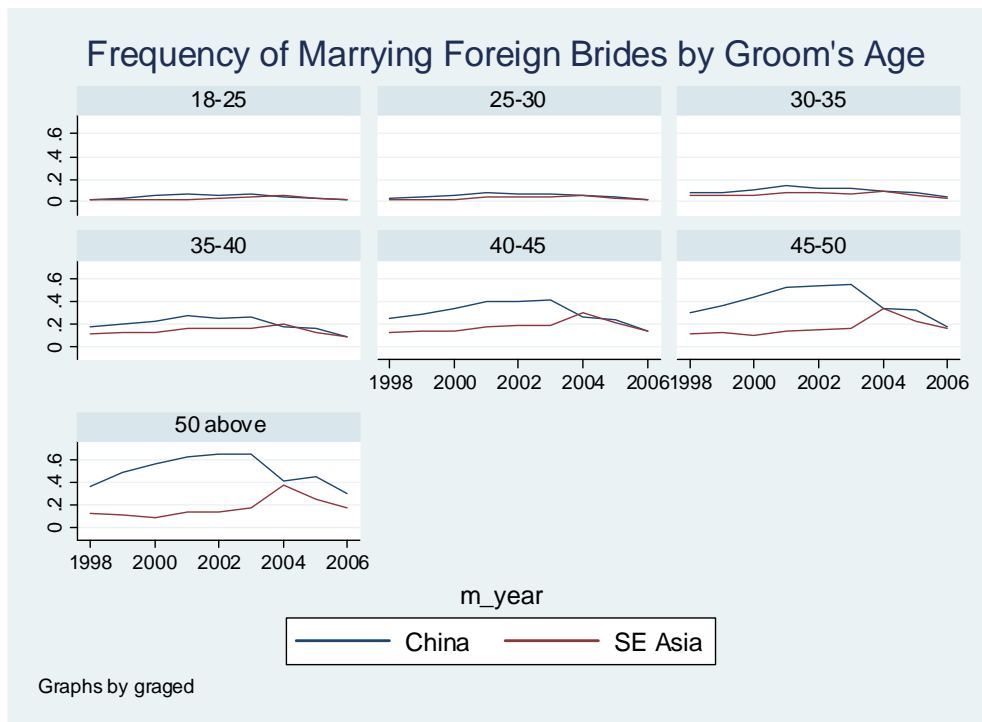
**Notes:** We let the density distribution of fertility  $\phi$ , given  $e$  be denoted by  $f(\phi|e)$ . We let  $F(\phi|e)$  denote the cumulative distribution of fertility, and let  $\alpha_x^e = F(\phi_x|e)$ .  $\phi_0$  indicates men's initial threshold, below which the marriage would dissolve. The level of  $\phi_0$  is dictated by man's utility level outside of marriages.  $\phi_1$  indicates men's new threshold with the influx of foreign brides.  $\alpha_0^1$  indicates the new probability of divorce if domestic women exert no effort when there is influx of foreign bride.  $\alpha^*$  is the probability of divorce beyond which low effort yields lower expected utility for the woman than high effort. When  $\alpha_0^1 > \alpha^*$ , it triggers domestic women to exert higher effort.

**Figure 6:** Overall Impact of Influx of Foreign Bride



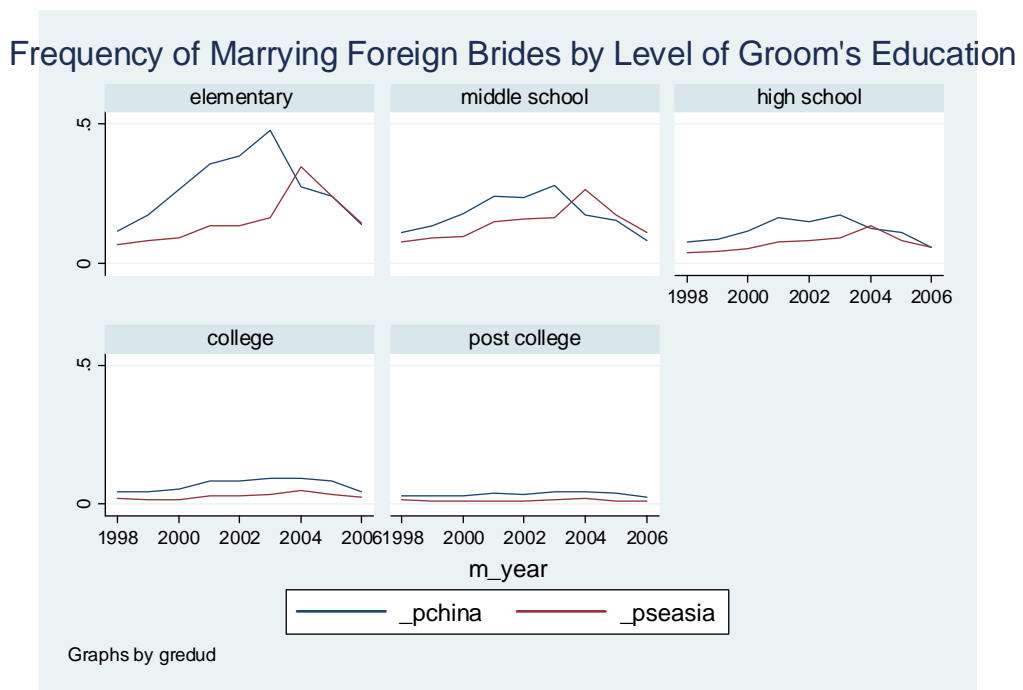
**Notes:** We let the density distribution of fertility  $\phi$ , given  $e$  be denoted by  $f(\phi|e)$ . We let  $F(\phi|e)$  denote the cumulative distribution of fertility, and let  $\alpha_x^e = F(\phi_x|e)$ .  $\phi_0$  indicates men's initial threshold, below which the marriage would dissolve. The level of  $\phi_0$  is dictated by man's utility level outside of marriages.  $\phi_1$  indicates men's new threshold with the influx of foreign brides.  $\alpha_0^1$  indicates the new probability of divorce if domestic women exert no effort when there is influx of foreign bride.  $\alpha^*$  is the probability of divorce beyond which low effort yields lower expected utility for the woman than high effort. When  $\alpha_0^1 > \alpha^*$ , it triggers domestic women to exert higher effort. As a result, the presence of foreign brides changes the divorce risk to  $\alpha_1^1 < \alpha_0^1$ , and it is possible that  $\alpha_1^1 < \alpha_0^0$

**Figure 7:** Frequency of Marrying Foreign Brides by Level of Groom's Age



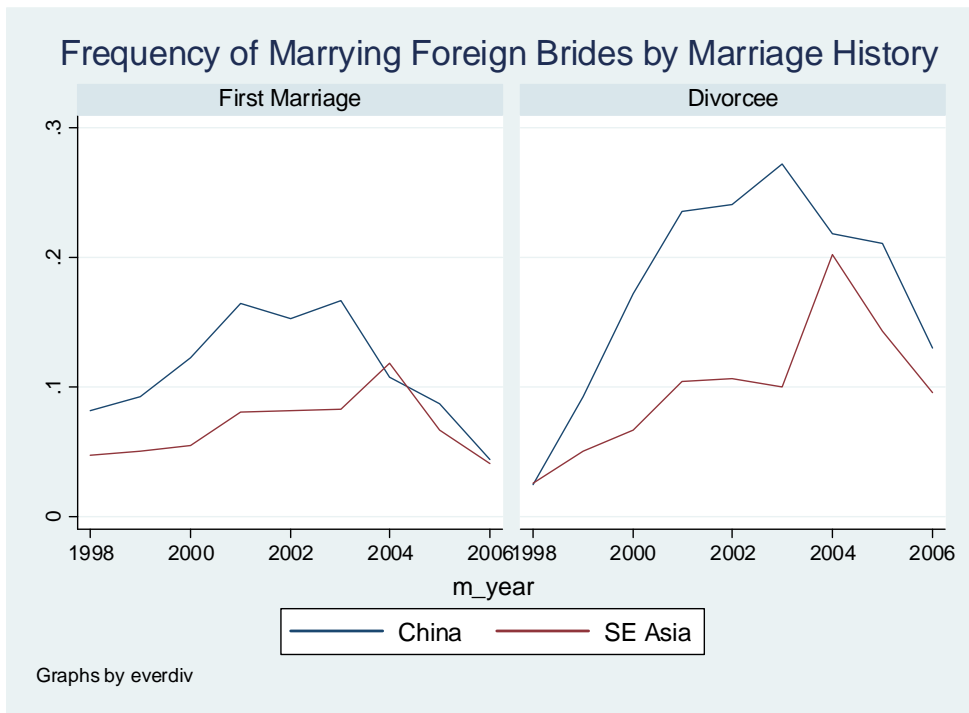
Notes: This figure is compiled using government marriage registries. It shows the share of new foreign brides between 1998 and 2006 broken down by groom's age. China include Macao, Hong Kong and mainland China. Southeast Asia include Vietnam, Indonesia, Malaysia, Thailand, Cambodia, Singapore, Philippine and Laos.

**Figure 8:** Frequency of Marrying Foreign Brides by Level of Groom's Education

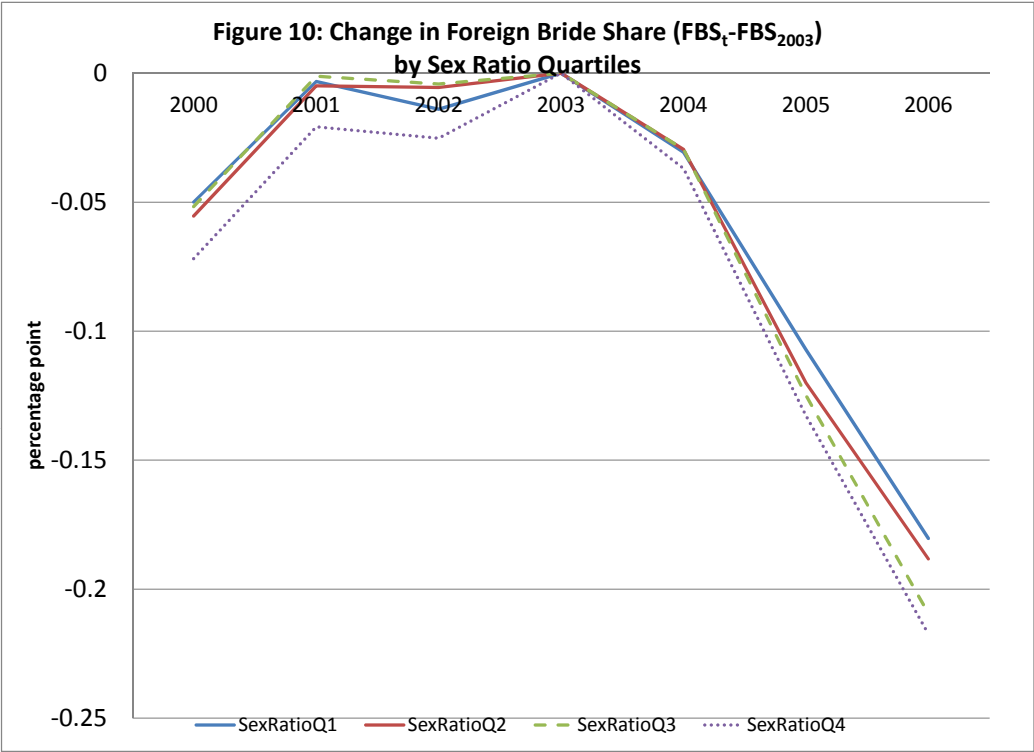


**Notes:** This figure is compiled using government marriage registries. It shows the share of new foreign brides between 1998 and 2006 broken down by groom's education level. China include Macao, Hong Kong and mainland China. Southeast Asia include Vietnam, Indonesia, Malaysia, Thailand, Cambodia, Singapore, Philippine and Laos.

**Figure 9:** Frequency of Marrying Foreign Brides by Groom’s Marriage History



Notes: This figure is compiled using government marriage registries. It shows the share of new foreign brides between 1998 and 2006 broken down by groom’s marriage history. China include Macao, Hong Kong and mainland China. Southeast Asia include Vietnam, Indonesia, Malaysia, Thailand, Cambodia, Singapore, Philippine and Laos.



Notes: This figure is compiled using government marriage registries. It shows the share of new foreign brides between 1998 and 2006 broken down by sex-ratio quartiles.

Table 1: Distribution of Foreign Brides from Top 5 Bride-Sending Countries

<b>Country of Origin</b>	<b>#</b>	<b>%</b>
China <sup>(a)</sup>	170,166	54.9
Vietnam	71,970	23.2
Indonesia	18,626	6.0
Thailand	6,124	2.0
Cambodia	4,147	1.3
Other	14,071	4.5
Missing <sup>(b)</sup>	24,851	8.0
Observations	309,955	

**Notes:** This includes all foreign brides married and registered between 1998 and 2006 <sup>(a)</sup>Includes brides from Macao, Hong Kong and Mainland China. <sup>(b)</sup>Despite country of origin was record as missing, one could still distinguish whether a bride is foreign-born based on bride's personal ID number.



Table 2: Summary Statistics among Couples Married in 1998

	By Origin of Brides		
	Taiwan	China	SE Asia
Education (Years)			
Grooms	11.0	9.6	9.3
Brides	10.6	10.4	8.6
Age at time of Marriage			
Grooms	30.9	43.7	36.8
Brides	27.9	29.9	25.2
Number of Children (By 2006)			
Sons	0.79	0.42	0.60
Daughters	0.73	0.40	0.56
Low birth weight (%) <sup>(a)</sup>	6.85	5.00	6.19
Infant Mortality Rates (0/100) <sup>(b)</sup>	4.90	4.30	4.60
Divorce (By 2006) <sup>(c)</sup>	0.17	0.24	0.25
Marriage Duration (Years) <sup>(d)</sup>	4.34	3.48	4.37
Observations	111,488	10,606	6,265

**Notes:** This table presents the summary statistics of couples who got married in 1998 by brides' origin. China includes brides from Macao, Hong Kong and Mainland China. Southeast Asia include Vietnam, Indonesia, Malaysia, Thailand, Cambodia, Singapore, Philippine and Laos. <sup>(a)</sup>Defined as the share of their children whose birth weight are less than 2500 grams. <sup>(b)</sup>Defined as the share of their children who die before reaching age 1. <sup>(c)</sup>Defined as the share of the couples that have been divorced by December 31, 2006. <sup>(d)</sup>Defined as duration of marriage conditional on being divorced by 2006.

Table 3: Reduced Form Impact of Policy on Fertility

	(1)	(2)	(3)	(4)	(5)
	2003/2005	All	Husband Education Level		
			0-8 yr	9 yr - College	College +
treat	0.0134*** (0.00220)	-0.0321*** (0.00451)	0.000441 (0.00340)	-0.0476*** (0.00400)	-0.0391*** (0.00287)
(2nd Quartile)*treat	-0.0127*** (0.00434)	-0.0177** (0.00753)	-0.0115** (0.00539)	-0.0156*** (0.00583)	-0.0138** (0.00590)
(3rd Quartile)*treat	-0.0222*** (0.00415)	-0.0349*** (0.00702)	-0.0312*** (0.00478)	-0.0277*** (0.00518)	-0.0246*** (0.00567)
(4th Quartile)*treat	-0.0322*** (0.00410)	-0.0498*** (0.00696)	-0.0398*** (0.00463)	-0.0392*** (0.00507)	-0.0341*** (0.00587)
Observations	1,144,503	2,915,375	698,443	1,415,568	801,364

Standard errors clustered at township level. Exclude fertility outcomes in 2004. Columns 2- 5 include outcomes in years from 2000 - 2006 but 2004. Township dummies, sex ratio quartiles, a set of year of duration of marriage wife's age, a dummy variable for never had a son are included. Education dummies are included in Columns 1 and 2. Restricted to women whose age is between 17 to 50.

Table 4: Reduced Form Impact of Policy on Fertility

	(1)	(2)	(3)	(4)	(5)
	2003/2005	All	Husband Education Level		
			0-8 yr	9 yr - College	College +
(2nd Quartile)*treat	-0.0063* (0.0033)	-0.0023 (0.0041)	-0.0021 (0.0042)	-0.0037 (0.0038)	-0.0008 (0.0035)
(3rd Quartile)*treat	-0.0136*** (0.0027)	-0.0126*** (0.0030)	-0.0178*** (0.0036)	-0.0089*** (0.0033)	-0.0052* (0.0031)
(4th Quartile)*treat	-0.0221*** (0.0028)	-0.0232*** (0.0030)	-0.0202*** (0.0035)	-0.0164*** (0.0033)	-0.0141*** (0.0037)
<b>County-Specific Trends</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Observations	1,144,503	2,915,375	698,443	1,415,568	801,364

Standard errors clustered at township level. Exclude fertility outcomes in 2004. Columns 2- 5 include outcomes in years from 2000 - 2006 but 2004. Township dummies, sex ratio quartiles, a set of year dummies for marriage duration, wife's age, a dummy variable for never had a son are included. Education dummies are included in Columns 1 and 2. Restricted to married women whose age is between 17 to 50.

Table 5: Robustness Checks for Fertility

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	Township- Time Trend	County-Year Fixed Effect	Drop Large Cities	+/- 2 years	Quartiles/ Village	2001/ 2003	2000/ 2002
treat	-0.0374*** (0.00488)	-0.0385*** (0.00707)	0.00741* (0.00403)	0.0102*** (0.00317)	-0.0404*** (0.00625)	-0.00601* (0.00348)	-0.0354*** (0.00470)
(2nd Quartile)*treat	-0.00438* (0.00233)	-0.00445 (0.00471)	-0.00348 (0.00446)	-0.00464 (0.00358)	-0.0135*** (0.00192)	0.00256 (0.00389)	0.00141 (0.00455)
(3rd Quartile)*treat	-0.00402* (0.00243)	-0.01655*** (0.00356)	-0.0144*** (0.00306)	-0.0126*** (0.00234)	-0.0180*** (0.00202)	-0.00611 (0.00405)	-0.00676 (0.00430)
(4th Quartile)*treat	-0.00998*** (0.00240)	-0.02862*** (0.00364)	-0.0252*** (0.00305)	-0.0244*** (0.00250)	-0.0219*** (0.00228)	-0.00731* (0.00434)	-0.00512 (0.00460)
Observations	2,915,375	2,915,375	2,328,705	2,188,624	2,915,375	994,595	818,138
R-squared	0.085	0.085	0.088	0.072	0.085	0.062	0.068

Note: Standard errors clustered at the township level. All regressions include Township dummies, sex ratio quartiles, a set of year dummies for marriage duration, wife's age, a dummy variable for never had a son, education dummies are included. County-specific time trends are included in Columns 3 to column 7. Treat is defined as post 2002 in Column 6 and post-2001 in Column 7. Restricted to married women whose age is between 17 to 50.

Table 6: Reduced Form Impact of Policy on Divorce

	(1)	(2)	(3)	(4)
	All	Husband Education Level		
		0-8 yr	9 yr - College	College +
treat	0.0207*** (0.000587)	0.0232*** (0.00126)	0.0298*** (0.000848)	0.0117*** (0.000566)
(2nd Quartile)*treat	0.000443 (0.000523)	0.00238* (0.00129)	-0.000604 (0.000657)	0.000263 (0.000540)
(3rd Quartile)*treat	0.00118** (0.000562)	0.00506*** (0.00120)	-0.000865 (0.000711)	5.44e-05 (0.000680)
(4th Quartile)*treat	0.00163*** (0.000506)	0.00412*** (0.00109)	-0.000578 (0.000612)	0.000493 (0.000689)
County-Specific Time Trend	X	X	X	X
Observations	2,915,375	698,443	1,415,568	801,364

Standard errors clustered at township level. Excluding divorce outcomes in 2004. Township dummies, sex ratio quartiles, a set of year dummies for marriage duration, wife's age, a dummy variable for never had a son are included. Education dummies are included in Column 1. Restricted to married women whose age is between 17 to 50.

Table 7: Hazard Analysis of Impact of Policy on Time to First Child

	(1)	(2)	(3)	(4)
	All	Husband Education Level		
		0-8 yr	9 yr - College	College +
treat	-0.0223*** (0.0275)	-0.0976*** (0.0386)	-0.9955*** (0.0294)	-0.0842*** (0.0322)
(2nd Quartile)*treat	-0.0652*** (0.0241)	-0.154*** (0.0339)	-0.0547* (0.0287)	-0.0519** (0.0198)
(3rd Quartile)*treat	-0.1349*** (0.0225)	-0.1787*** (0.0403)	-0.1007*** (0.0241)	-0.0948*** (0.0239)
(4th Quartile)*treat	-0.2040*** (0.0223)	-0.2135*** (0.0386)	-0.1142*** (0.0238)	-0.1068*** (0.0241)
Observations	1395730	284333	634692	476705

Coefficients from hazard analysis are reported. Standard errors clustered at township level. Time elapsed is defined as wedding date till time to first child. Township dummies, sex ratio quartiles, wife's age are included. Education dummies are included in Column 1. Restricted to married women whose age is between 17 to 50.

Table 8: First Stage Result

<i>Dependent Variable: Foreign Bride Share</i>	
(2nd Quartile)*treat	0.0016 (0.0053)
(3rd Quartile)*treat	-0.0045 (0.00463)
(4th Quartile)*treat	-0.0152** (0.00509)
F_test	5.56
Observations	3488407

Standard errors clustered at township level. Township dummies, sex ratio quartiles, a set of year of duration of marriage wife's age, education dummies, a dummy variable for never had a son, county-specific time trends are included. Restricted to women whose age is between 17 to 50.

Table 9: 2SLS Estimate of Impact of FBS on Divorce/Fertility

	(1)	(2)	(3)	(4)
	all	0-8 Yr	<u>Husband's Edu</u>	
			9yr - College	College +
<u>Panel A: Dep Variable: Having a Child</u>				
FBS <sub>(t-1)</sub>	0.9980*** (0.2696)	0.3867*** (0.0913)	0.5863** (0.1799)	0.28453* (0.1261)
<u>Panel B: Dep Variable: Divorce</u>				
FBS <sub>(t-1)</sub>	-0.0791** (0.0352)	-0.0703 (0.0976)	-0.0273 (0.0399)	-0.0547 (0.0369)
Observations	3488407	827725	1693800	966882

Standard errors clustered at township level. Township dummies, sex ratio quartiles, a set of year of duration of marriage wife's age, a dummy variable for never had a son, county-specific time trends are included. Education dummies are included in Column 1. Restricted to women whose age is between 17 to 50.