Housewife, "Gold Miss," and Equal: The Evolution of Educated Women's Role in Asia and the U.S.

Jisoo Hwang*

Abstract

The fraction of U.S. college graduate women who ever marry has increased relative to less educated women since the mid-1970s. In contrast, college graduate women in developed Asian countries have had decreased rates of marriage, so much so that the term "Gold Misses" has been coined to describe them. This paper argues that the interaction of rapid economic growth in Asia combined with the intergenerational transmission of gender attitudes causes the "Gold Miss" phenomenon. I present a simply dynamic model then test its implications using U.S. and Asian data on marriage and time use.

JEL: J12, D19, Z10, N35.
Keywords: Marriage, education, female labor force participation, cultural transmission.

*Department of Economics, Harvard University, Cambridge, MA 02138 (email: theji500@gmail.com). I am grateful to Alberto Alesina, Raj Chetty, Claudia Goldin, and Lawrence Katz for their guidance and feedback throughout this project. I would also like to thank Wenxin Du, John Friedman, Paola Giuliano, Edward Glaeser, Seok Ki Kim, Joana Naritomi, Claudia Olivetti, Amanda Pallais, Dana Rotz, László Sándor, Anitha Sivasankaran, and seminar participants at Harvard University for helpful comments and discussions. This project received financial support from the Lab for Economic Applications and Policy at Harvard University. All remaining errors are my own.

1 Introduction

Marriage rates have decreased among women in Japan, South Korea (hereafter Korea), Taiwan, Singapore, and Hong Kong during the past several decades. As covered in a recent article in *The Economist*, "The Asian avoidance of marriage is new, and striking. ... In South Korea, young men complain that women are on marriage strike."[1] The majority of women on this "marriage strike" are highly educated, four-year college graduates. Koreans call this growing group of educated single women "Gold Misses."[2]

Later marriages are common among the educated worldwide. What is striking about the phenomenon in Asia, however, is that Gold Misses are not merely delaying marriage. Rather, they are remaining single and at a much higher cost than in the West. Cohabitation is rare and out-of-wedlock childbirths make up less than 2 percent of total childbirths in Korea and Japan.[3] Moreover, the gap in marriage rates between college graduate and non-college graduate women has not diminished in Asia—it has grown. In the U.S., in contrast, the gap narrowed and reversed in the mid-1970s.[4]

Why are there Gold Misses and why are they increasing in developed Asia? This paper argues that the interaction of Asia's rapid economic growth combined with the intergenerational transmission of gender attitudes causes the Gold Miss phenomenon. Wage growth creates incentives for more women to become educated and to participate in the labor market. However, gender norms do not shift at once; they are passed from one generation to the next. Men are still accustomed to women being housewives as in their mothers' generation and have preference for wives' household

[1] *The Economist*, "The flight from marriage," August 20th 2011.

[2] Terms have been coined in each region to refer to this group—in Korean *Gold Miss* (because they are "old misses" but highly educated and financially independent), in Japanese *Hanako-zoku* (literally "Hanako tribe," named after the readers of the consumer magazine *Hanako*, which targets young single women) or *Wagamama* (translated as "single parasites" because most unmarried adults live with their parents), and in Chinese *Sheng-nu* (translated as "leftover women"). Among these, I choose to use the term Gold Miss throughout this paper.

[3] Korea and Japan are ranked the two lowest among OECD countries in out-of-wedlock childbirths. 38 percent of births are out-of-wedlock in the U.S. (OECD Family Database, 2011)

[4] For references on the trends of U.S. college graduate women's marriage and fertility, see for example, Kalmijn (1991), Goldin (2004), Schwartz and Mare (2005), and Stevenson and Wolfers (2007).

services. Thus, some educated women choose to remain single rather than marry "traditional" men.

The story sketched above emerges from a simple dynamic model of intergenerational transmission of gender attitudes, in which the fraction of men with preference for wives' household time decreases with the fraction of educated women in the previous generation. Women's education, marriage, and household time allocation decisions are functions of the endogenously evolving preferences within the male population.[5] The model predicts that Gold Misses are more likely to arise in economies that experience rapid, rather than gradual, growth in women's wages.

To empirically evaluate this hypothesis, I use three different datasets. First, I use the Japanese General Social Survey to explore the gender attitudes and marriage patterns of Japanese men. Second, I use the American Time Use Survey to study time allocation at home among U.S. immigrants from Gold Miss countries. Lastly, I use the U.S. census data to analyze marriage patterns of men and women from two major Gold Miss countries—Korea and Japan.

I find evidence consistent with the implications of my model. First, men's gender attitudes are affected by the economic status of women in their parents' generation. Men in Japan who had working or college graduate mothers during childhood have more egalitarian views regarding gender roles, and are more likely to have working wives. Among U.S. immigrants from Gold Miss countries, U.S. born men spend about 3 hours per week more on housework relative to foreign born men while reducing their wives' time spent on housework.

Second, women marry "less traditional" men (rather than "traditional") when they are available. In Japan, the probability that a college graduate man ever marries is positively correlated with his mother's LFP. Among Koreans and Japanese residing in the U.S., foreign born women are 20 percentage points more likely than their male peers to marry a non-Korean or non-Japanese. I exploit regional variation in the composition of male population to show that Korean and Japanese women are more likely to marry out of their ethnic group when the foreign born share is higher among Korean and Japanese men.

[5] c.f., Fernández et al. (2004).

Third, the increase in Gold Misses is less severe when the fraction of "less traditional" men in the marriage market is larger. In contrast to Korea and Japan, I find that college graduate Korean and Japanese women in the U.S. are as likely to be married as the non-college graduates.

The results indicate that educated women's marriage prospects are better when the generation gap in women's educational attainment (and LFP) is smaller. This offers new insight into the forces underlying the evolution of educated women's role. Previous studies have focused on the supply-side determinants such as the introduction of the pill, the opening up of co-ed universities, and the advancements in household appliances technology.[6] These changes enabled the supply of educated and working women to increase in the marriage market. However, this paper demonstrates that an equally important determinant is the demand-side—whether men *want* educated and working wives who outsource housework—and thereby shows how women's role may not transition smoothly from housewife to equal even with economic growth.[7] I also add to the line of research on cultural norms by providing an example of how rigid gender roles may weaken in response to changes in women's relative wages, and research on the assimilation of immigrants by explaining why there may be significant gender gaps in marital assimilation.[8]

The remainder of the paper is organized as follows. Section 2 provides an overview of the Gold Miss phenomenon with statistics from developed Asian countries. Section 3 presents the dynamic model. Section 4 lays out the empirical results. Section 5 concludes.

[6]See for example, Goldin and Katz (2002), Greenwood et al. (2005), and Goldin and Katz (2011).

[7]Feyrer et al. (2008) share similar intuitions, although they do not present a formal model. Looking at cross-country differences in fertility rates, they argue that countries where women's household status lags behind their labor market opportunities experience the lowest fertility rates.

[8]See for example, Giuliano (2007), Fernández and Fogli (2009), Alesina and Giuliano (2010), Alesina et al. (2011), and Hwang (2013) for discussions on the persistence of family culture. Regarding assimilation profiles by gender, Blau and Kahn (2007) study Mexican immigrants in the U.S. and find dramatic assimilation in labor supply for female immigrants.

2 Background: The Gold Miss Phenomenon in Asia

Gold Miss (and analogous terms used in Asia, see footnote 2) colloquially means a never married woman in her thirties or older who has received at least a four-year college education, has her own career, and earns a higher-than-average yearly income. She is not just a "Miss," she is a rich one. In order to use one general standard for different countries, in this paper I define Gold Miss as a *four-year college graduate woman over age 35 who has never married.*[9] The Gold Miss phenomenon then refers to the increase in the share of college graduate women who have never married relative to that of non-college graduate women.

The Gold Miss countries are the East Asian "tiger economies" that achieved economic miracles over the past half-century. Historical trends of GDP per capita in Hong Kong, Japan, Korea, Singapore, and Taiwan contrast starkly with that of the U.S. and the world average (see Appendix Figure A1). The growth trajectories of the Asian economies share a common pattern—rapid economic development from the 1960s onward (with growth rates in excess of 7 percent a year). The U.S. has had a higher GDP per capita than Asia since the early 20th century and follows a more gradual growth path throughout.

Asia's growth opened up (and benefited from) new opportunities for women. According to the United Nations statistics, labor force participation rates of women in the age group 25–34 in Japan, Korea, and Singapore increased by more than 17 percentage points from 1985 to 2006.[10] Educational attainment shows a similar pattern. There were virtually no college graduate women in East Asia before World War II but with economic development and education reforms, tertiary enrollments greatly increased.

[9]Age thirty-five is young enough to capture recent developments and old enough to distinguish between "marriage delayed" and "marriage forgone" among women in Asia. Despite the rise in women's age at first marriage—29 in Japan and Korea, 28 in Taiwan, 30 in Hong Kong, and 28 in Singapore (Jones and Gubhaju, 2009)—marriage rates fall starkly once women reach their late thirties. The age-specific marriage rate for brides in age group 35–39 is only 12.2 (per thousand) in Korea and 9.2 (per thousand) in Japan (Statistics Korea, 2010 and Vital Statistics of Japan, 2009). This is not unrelated to the fact that female fertility drops sharply after age 35.

[10]The statistics for Japan, Korea, and Singapore in 1985 are 56.6 percent, 39.2 percent, and 58.3 percent, respectively. U.S. begins at around 70 percent and increased by 5 percentage points from 1985 to 2006.

In Japan, although the college gender gap persists, women's college enrollment rates rose from near zero in 1955 to 41 percent in 2007 (Basic School Survey). In Korea, women's college enrollment rates increased from 20 percent to 55 percent in just 18 years and the college gender gap has disappeared (Statistical Yearbook of Education).

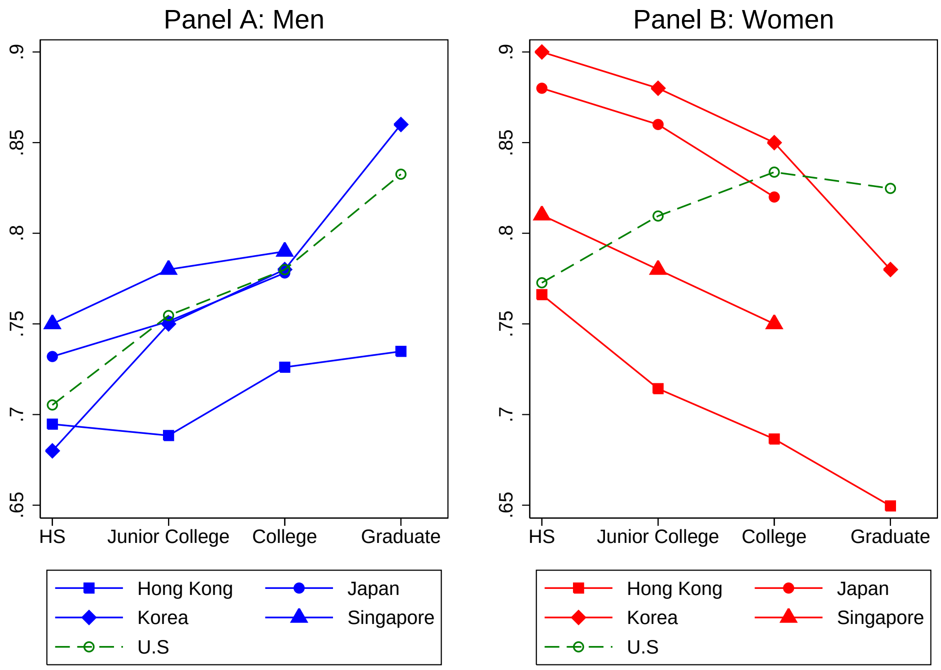

Figure 1: Fraction Ever Married by Sex and Education, Ages 35–39

Notes. Fraction ever married among men and women in age group 35–39 by educational attainment level in each country. Data are from the 2006 Hong Kong Population Census, the 2000 Japanese Population Census, summary tables from the 2010 Korean Population Census, Singapore's "Population in Brief 2011," and the 2010 American Community Survey. Each country has a different education system but I divide them into four common groups for comparison. High school refers to "Senior Secondary" schools in Hong Kong, high schools in Japan, Korea, and the U.S., and "Post-Secondary" schools in Singapore. Junior college refers to "Post-secondary (non-degree)" in Hong Kong, "Junior College/Vocational School" in Japan, less than four-year colleges in Korea and the U.S., and "Diploma & Professional Qualification" in Singapore. College refers to "Post-secondary (degree)" in Hong Kong and four-year universities in other countries. See Appendix A.2 for details. Since Japan and Singapore do not report separately for graduate school, "College" also includes those with more than a college degree in these countries.

Despite the transformation in women's LFP and education, marriage prospects for educated women in developed Asian nations have evolved quite differently from that of the West. Figure 1 depicts the fraction ever married among men and women in their late 30s in Hong Kong, Japan, Korea, Singapore, and the U.S. by education level. In all four Asian countries, higher education increases the marriage probability for men but lowers the marriage probability for women. The consequences are twofold: the least educated men are left single unless they "import" brides from, for example, developing South Asian countries, and highly educated women remain unmarried and become Gold Misses.[11] In the U.S., on the other hand, education has a positive relationship with marriage probability for both men and women.

The negative education gradient for women in Asia has even become steeper than in the past. Figure 2 plots the difference in fraction ever married between college graduates and non-college graduates in each birth cohort, among men and women over age 35 in Hong Kong, Japan, Korea, and the U.S.[12] Panel A shows that for men, college graduates' marriage probabilities increased relative to non-college graduates.' Panel B shows that for women, not only are college graduates less likely to be ever married than non-college graduates, but the gap has widened over time in Asian countries. For the most recent 1970s birth cohort, the difference amounts to 14 percentage points in Hong Kong and 5 percentage points in Japan and Korea. This contrasts with the upward slope in the U.S.: the difference in fraction ever married between college and non-college women has switched from negative to positive for American women.

How do the Asian college graduate women of earlier and later cohorts differ? One major difference is in their careers. College graduate women in Asia are now not only working but are also increasingly taking on professional full-time occupations once considered to be men's. Female-to-male median earnings of full-time employees in Japan increased from 45 percent

[11] See Kawaguchi and Lee (2012) for a discussion about female migration from developing Asian countries to developed East Asian countries. They find that foreign brides currently comprise 4 to 35 percent of newlyweds in Japan, Korea, Singapore, and Taiwan although there is no raw sex ratio imbalance in these countries. Men with low socioeconomic statuses marry foreign women.

[12] Singapore and Taiwan do not provide Census micro-data. Including all individuals over age 35 may overstate the marriage rates of earlier cohorts since they are being observed at later ages than recent cohorts. The bias is expected to be relatively unimportant, however, since first marriages are rare once women reach their late thirties. (See footnote 9 for more detail.)

in 1954 to 64 percent in 2006, and in Korea from 42 percent in 1975 to 67 percent in 2009. This contrasts with the earlier development in the U.S.—the ratio was 46 percent from as early as 1890.[13]

Women's new roles imply conflict for Asian families. Confucian ethics prescribe gender norms in all Gold Miss countries that for centuries described the ideal woman as a "good wife, wise mother."[14] Despite the growing number of dual-earner households, the belief that women should be responsible for child rearing and housework continues. Arranged marriage has nearly disappeared but marriage is still considered a union of two families (rather than just the man and the woman). Hence, relatives and parents (in-laws) are continuously watching over the married couple's life. Pre-marital cohabitation and out-of-wedlock childbirths are socially stigmatized.

According to the 2005–2008 World Value Survey, the percentage of people who disagreed with the statement "When jobs are scarce, men should have more right to a job than women" is 66.4 percent in the U.S., but only 44.2 percent in Hong Kong, 17.9 percent in Japan, 26.4 percent in Korea, and 36 percent in Taiwan.[15] To the statement "It is more important for a wife to help her husband's career than to have one herself," 70.4 percent of Americans disagreed (General Social Survey) whereas the percentage of respondents who disagreed is less than half of that in Asia—22.9 percent in Japan, 35 percent in Korea, and 31.2 percent in Taiwan (East Asian Social Survey).[16]

Time Use Survey findings confirm these beliefs. Among dual-earner

[13] Japanese data are from the Statistics and Information Department of the Ministry of Health, Labour, and Welfare. Korean data are from the 1975–2009 Occupational Wage Survey. See Goldin (1990) Table 3.2 for U.S. data.

[14] *ryōsai kenbo* in Japanese, *hyun mo yang ch'o* in Korean, and *xián qī liáng mù* in Chinese.

[15] Possible answers are (1) Agree, (2) Disagree, and (3) Neither. (Don't know and missing are excluded.) The sample size for each country is U.S. 1,238, Hong Kong 1,225, Japan 1,042, Korea 1,197, and Taiwan 1,226. No statistics are available for Singapore on this question.

[16] Possible answers are (1) Strongly agree, (2) Agree, (3) Disagree, and (4) Strongly disagree in the GSS and (1) Strongly agree, (2) Fairly agree, (3) Somewhat agree, (4) Neither agree or disagree, (5) Somewhat disagree, and (6) Strongly disagree in the EASS. (Don't know and missing are excluded.) The sample size for each country is U.S. 13,748, Japan 2,130, Korea 1,605, and Taiwan 2,102. Singapore and Hong Kong are not included.

households, women's average time spent on household activities is at least 2 hours (per day) longer than men's in Japan and Korea (Japanese Time Use Survey, 2006 and Korean Time Use Survey, 2009).[17] Gender gap exists in the U.S. as well, but the magnitude is much smaller—50 minutes per day (American Time Use Survey, 2003–2011).

There is virtually no difference in household appliances technology between the Gold Miss countries and other developed countries. The relative price of hiring a live-in domestic worker in the U.S. and in East Asia is also comparable, at about 40 percent of the mean wage of native college graduate women. In fact, the price is lower in Taiwan and Singapore, and particularly lower in Hong Kong, than in the U.S.[18]

Thus, although the Gold Miss phenomenon may look similar with what occurred in the U.S. and elsewhere when women first began to graduate from college, there are important differences. In the early twentieth century, women could not easily have both family and career with the (lack of) contraceptive methods, household appliances technology, market substitutes for household production, and labor market opportunities (Goldin, 2004). As surveyed in this section, women in developed Asia today do not face these conditions. Rather, the constraints of marriage derive from traditional household roles families expect from the wife and daughter-in-law.

[17] See Appendix A for information on these datasets.

[18] Hong Kong has a foreign domestic worker (FDW) program and the government sets the minimum wage for these workers. According to Cortes and Pan (2013), the minimum wage is more than four times lower than high skilled women's wage. Though limited, Taiwan and Singapore have similar programs; the FDW's wage is about 30–40 percent of native college graduate women's. Japan and Korea have stricter immigration policies. The relative price of live-in domestic workers is nearly half of native college graduate women's wage, as in the U.S. (See Huang et al., eds, 2005 for more information on foreign domestic workers.)

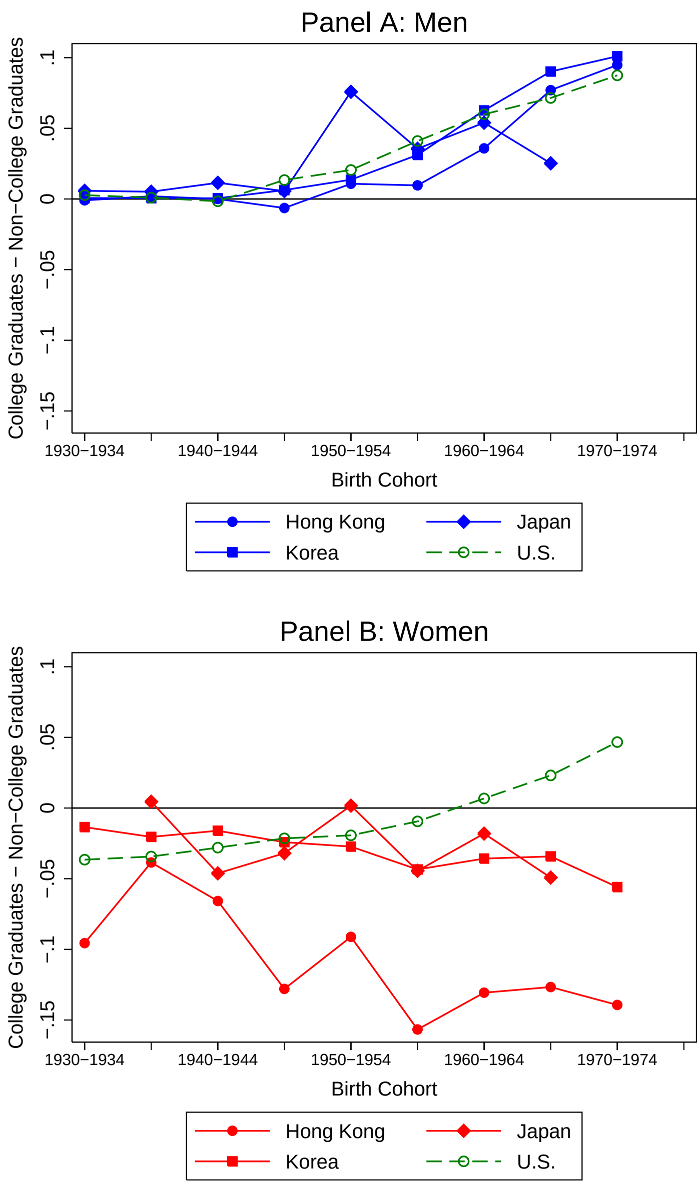

Figure 2: Difference in Fraction Ever Married Between College Graduates and Non-College Graduates, Over Age 35

Notes. Difference in the fraction ever married between college graduates and non-college graduates, among men and women over age 35 in each birth cohort. Data are from the 2006 Hong Kong Population Census, 2000–2008 Japanese General Social Survey, 1995 and 2000 Korean Population Census, 2012 Korean Economically Active Population Survey, and the 2010 American Community Survey. See Appendix A for details. The 1965 cohort in Japan includes birth years 1965–1972 and the 1970 birth cohort in Korea includes birth years 1970–1976. College refers to four-year colleges in Japan, Korea and the U.S., and post-secondary (degree) levels in Hong Kong. I exclude respondents still attending school at the time of the survey.

3 Model of the Intergenerational Transmission of Gender Attitudes and of Marriage

Building on the framework of Fernández et al. (2004), I develop a simple dynamic model where women's education, marriage, and labor force participation decisions are functions of wages and the endogenously evolving types within the male population—"traditional" and "modern." I define a man as traditional if he has preference for his wife's household services and modern if he is willing to substitute wife's housework with his own or with market goods and services. The fraction of modern men increases with the fraction of educated women in the previous generation.

When women's wages rise, more women choose to stay single than marry traditional husbands. The key distinguishing prediction of this model is the path dependency of the Gold Miss phenomenon. Given that men initially hold traditional values, economies where women's wages increased rapidly are more likely to experience the Gold Miss phenomenon compared with economies where women's wages increased gradually over time. In the rapid case, a large discrepancy appears between the women's roles when men were growing up and women's roles in their own cohort. As a result, there are not enough modern men for the newly educated women to marry.[19]

I make the following assumptions for tractability. Women differ in their effort costs of becoming educated and can choose to invest in education ("educated," E) or not ("uneducated," U). If a woman invests in her education, she gets wage w_E in the labor market, which is higher than the wage she would get if uneducated, w_U. w_E is randomly drawn from a distribution that varies exogenously over time. Men, on the other hand, are assumed to have homogeneous skill level and earn w_m in the labor market.[20]

[19]Standard models of household production can also show that growth in women's earning power reduces the gain from marriage or that positive assortative mating becomes optimal as technology advances (Becker, 1991). However, they cannot explain why marriage patterns would evolve differently across similarly developed countries. Intra-household models also face this limitation if bargaining power is a function of only wages. (See Chiappori and Donni, 2011 for a survey of this literature.) Assuming that the sharing rule is affected by other "distribution factors," in which gender attitudes can be a component, is an option. The difference with my model would then be that the husband's type affects the wife's utility via consumption.

[20]If men also differed in their educational attainment and wages, there would be four categories of men, with the modern and educated being the most attractive husband

Men differ in their cultural upbringing: those who grew up around educated women develop less traditional gender attitudes ("modern," M) compared with those who grew up around housewives ("traditional," T). All agents are rational and forward-looking.

The timing in the model is as follows. In the first period, women decide whether or not to become educated. In the second period, men and women are randomly matched and decide whether to get married or remain single. In the third period, men and women decide on a time allocation between market activity and household production. Below I describe the intergenerational dynamics and then solve for each stage of the decision-making process.

3.1 Intergenerational Dynamics

Gender attitudes (or more specifically, men's preferences for wives' household services) are transmitted from mother to son. Assuming, as is reasonable for Asia, that only married women have children, the fraction of modern men (λ_M) in cohort t then depends on the fraction of married educated women in the previous cohort. The dynamics of the system are thus given by:

$$\lambda_{Mt+1}(\lambda_{Mt}) = p_{Et}(\lambda_{Mt})\lambda_{Et}(\lambda_{Mt}) \tag{1}$$

where p_{Et} is the marriage probability of educated women and λ_{Et} is the fraction of educated women at t (both are functions of λ_{Mt}).[21]

This intergenerational linkage can be supported by at least two different mechanisms. First, parents exert a direct socialization effort to influence their children's process of preference formation. This is similar to the idea of "direct vertical socialization" discussed in Bisin and Verdier (2000). Educated mothers teach their sons that a family can function well with substitutes of her time.

Second, people tend to imitate others and like those who are similar to

and the traditional and uneducated being the least attractive. Figure 1 Panel A and Kawaguchi and Lee (2012) address this outcome. Since my paper's focus is on the Gold Misses, I do not add the education dimension to men. But the traditional and uneducated men not being able to marry is a by-product of the Gold Miss phenomenon, and can thus be explained by the same mechanisms addressed here.

[21] p_{Et} is defined in equation (6) below. How λ_{Et} is endogenously determined is discussed in Section 3.4.

themselves, as is well-documented in research on peer effects, discrimination, and social norms.[22] Even if mothers do not teach specific values to their children, boys are likely to emulate their parents or other role models when they form their own families.[23]

Whichever mechanism is at work (or most likely, a combination of these mechanisms), the dynamics can be expressed as equation (1) in reduced form.[24] Note that since preferences are formed during childhood, men cannot freely choose to be one type or the other (the cost of changing one's attitudes is very high).

3.2 Household Decision

All individuals are endowed with a unit of time. Within a married household, each spouse decides how much time t to allocate to market activity; the remaining time $(1-t)$ is allocated to household production. Market activity yields a marginal return (wage) of w_m for men and w_f for women, where I assume $w_m > w_f$.[25] Time allocations are a Nash equilibrium of a game in which each spouse decides his or her time allocation taking as given the time allocation of the other partner. (Results do not depend on the this specification. See Appendix B.1.1.)

The welfare of a married individual consists of utility from consumption and utility from household public goods. Consumption is derived from

[22] See for example, Becker (1957) and Akerlof and Kranton (2000).

[23] Similar effects may exist for girls as well: girls who grew up in male-breadwinner households may be more traditional than those who grew up in dual-earner households. For example, Olivetti and Patacchini (2012) study how women's working behavior is influenced by the working status of their mothers and their childhood friends' mothers using the National Longitudinal Survey of Adolescent Health. However, when economic growth creates opportunities for girls that did not exist for their mothers, girls are no longer constrained to traditional roles. Thus, given the time frame of my model—the past century during which women's wages increased greatly—the intergenerational transmission plays a much smaller role (on net) for girls than for boys. Section 4.1 presents supportive evidence (see footnote 39).

[24] I do not take a stance on the specific mechanism as I do not attempt to distinguish between them in my empirical work.

[25] When w_f is higher than w_m, the wife works full-time whereas the husband works part-time ($t_f = 1, t_m = 1-\frac{2\beta}{w_m}$). When w_f becomes sufficiently higher, ν_f intersects with V_{fM}. After that point, an educated woman would choose not to marry even the modern type because the gain from consuming her income all by herself becomes larger than the gain from having a husband doing housework. In all countries, however, women's wages are still lower than men's, and hence I abstract from this case.

total household earnings, $w_m t_m + w_f t_f$, which is split equally between the couple. The household public good is a function of the total time invested in household production, $(1 - t_m) + (1 - t_f)$, and $\beta > 0$ is the value of the public good to each individual.

The utility function of a man m married to a woman f is:

$$V_m(w_m, w_f) = \max_{0 \leq t_m \leq 1} \frac{1}{2}(t_m w_m + t_f w_f) + \beta log((1 - t_m) + (1 - t_f)) \quad (2)$$

where he takes t_f as given. Men's utility function depends only on wages.

On the other hand, the utility function of a married woman f also differs by husband's type $j = M, T$:

$$\begin{aligned} V_{fj}(w_m, w_f) = \max_{0 \leq t_f \leq 1} & \frac{1}{2}(t_m w_m + t_f w_f) + \beta log((1 - t_m) + (1 - t_f)) \\ & - (\alpha_0 + \alpha_1(t_f)) I_{j=T} \end{aligned} \quad (3)$$

where $I_{j=T}$ is an indicator for whether husband is traditional type. That is, a married woman incurs a direct disutility of $\alpha_1(t_f)$, which is an increasing function of t_f, and a fixed amount of α_0 if her husband is traditional.[26] For analytical purposes, let $\alpha_1(t_f)$ be an indicator function: $\alpha_1 > 0$ when $t_f > 0$ and $\alpha_1 = 0$ when $t_f = 0$. Emotional gain from marriage may be reduced when the husband and in-laws are traditional, due to increased marital tensions, pressure to take better care of family members or to quit her job, or domestic violence.[27]

Note that the share $\frac{1}{2}$ is not affected by male type. That is, a traditional husband does not "steal" more from his wife than a modern husband, and hence there is financial benefit from marriage regardless of the husband's type. This is a conservative assumption; if the share also depends on the husband's type such that women married to traditional men get less than half, this would make traditional men even less attractive as partners (see footnote 19). Men's productivity at home is also assumed to be the

[26] See Appendix B.1.1 for a discussion on how the model changes when the disutility term is only in the men's utility function.

[27] Refer to Section 2 to see cross-country variation in responses to stylized gender role questions. Research on the relationship between husbands' gender attitudes and the quality of marital relations provide further evidence. See for example, Hochschild and Machung (1989) and Rubin (1983).

same. The willingness to engage in household tasks may differ (and hence be incorporated in the disutility term), but it is unlikely that there are fundamental differences across men in their ability to do them.

The first order conditions of equations (2) and (3) when the husband is a modern type yield:

$$\begin{cases} 2 - t_m - t_f = \frac{2\beta}{w_m} \\ 2 - t_m - t_f = \frac{2\beta}{w_f} \end{cases}$$

respectively. Because $w_m \neq w_f$, at least one of the agents must be at a corner solution. There are two possible cases: (i) when $w_f \leq 2\beta$, $t_m = 1$ and $t_f = 0$, (ii) when $w_f > 2\beta$, $t_m = 1$ and $t_f = 1 - \frac{2\beta}{w_f}$. It is always optimal for married men to work full-time regardless of women's wages because men's wages are higher than women's. A married woman becomes a housewife in case (i) but works part-time in case (ii).[28] Henceforth, I assume for clarity that uneducated women's wages are lower than 2β and educated women's wages are higher than 2β.

When the husband is a traditional type, because of the disutility term $\alpha_1(t_f)$, the wife starts to work at a wage higher than 2β.[29] I denote this threshold wage as $\underline{w}_E$.

An individual's utility when single is defined analogously.[30]

$$\nu_i = \max_{0 \leq t_i \leq 1} w_i t_i + \beta log(1 - t_i) \tag{4}$$

The optimal time allocation is $t_i = 0$ when $w_i \leq \beta$ and $t_i = 1 - \frac{\beta}{w_i}$ when $w_i > \beta$. I assume that household production is valued such that $V_m(w_m, w_U) \geq \nu_m$ (i.e. men prefer to marry a housewife than to remain

[28] Outcomes are not assumed to be Pareto efficient ex-ante. Case (i) turns out to be Pareto efficient but (ii) is not when w_f is high enough to allow an educated woman to reject a traditional man. A Pareto improvement is then possible if the traditional man offers her a "bribe" to compensate her for the disutility she incurs from marrying him. Whether this can be a binding contract is highly questionable, however. The contract would require the husband to allow his wife to consume more than half the total income, and this would not be time-consistent if the traditional man could renege once the educated woman is married to him (and there is a non-trivial cost of divorce).

[29] α_0 is a level effect, and hence does not affect the threshold wage itself.

[30] Alternatively, I can assume that the value of household production is smaller for unmarried agents (i.e. smaller than β) if for instance, children are the main source of utility in household public goods and unmarried agents do not have children. I keep the same β as in equations (2) and (3) to keep the algebra as simple as possible.

single).

3.3 Marriage Decision

Matching is done as a one-period random search in which the probability of meeting another individual (of a different sex) of type j is given by the fraction of type j in the population.[31] Hence the probability that a woman is matched to a modern type is λ_M and the probability that she is matched with a traditional type is $1 - \lambda_M$. Individuals decide whether to stay in a match (that is, marry) and obtain utility V_{ij} as in equations (2) and (3) or to remain single and obtain utility ν_i as in equation (4). An individual i chooses to marry j if and only if $V_{ij} \geq \nu_i$ holds.

$V_m(w_m, w_U) \geq \nu_m$ implies that men marry educated women as well as uneducated women, since V_m increases in w_f. A woman's marriage decision depends on her wage and the type of man she is matched to. If matched to a modern type, she chooses to marry. But if matched to a traditional type, she may prefer to remain single when her wage is sufficiently high. Given the disutility term, $\nu_f > V_{fT}$ is possible as w_f rises because the marginal return from one's wage is higher when it is not shared with a spouse.

Denote the woman's wage at which ν_f intersects with V_{fT} as $\widetilde{w}_E$. Depending on the relative size of α_0 and α_1, I then get the following relationship between $\underline{w}_E$, $\widetilde{w}_E$, and w_m:

Proposition 1.

$$\beta log2 < \alpha_0 + \alpha_1 < \frac{1}{2}(w_m - \underline{w}_E) + \beta log2 \tag{5}$$

When α_0 and α_1 satisfy equation (5), $\underline{w}_E < \widetilde{w}_E < w_m$. When they are larger, $\widetilde{w}_E < \underline{w}_E < w_m$. When they are smaller, $\underline{w}_E < w_m < \widetilde{w}_E$.

(The proof for this and all other propositions can be found in Appendix B.2.)

[31] Allowing individuals who are unmarried after the first round to redraw does not make any difference in the fraction and type of men and women who remain single, because only educated women and traditional men would remain. A directed search model would yield a higher fraction of married agents in the population, because modern men prefer educated women to uneducated women (V_m increases in w_f). However, a directed search model would require all women to correctly anticipate ex-ante what fraction of her contemporaries would choose to become educated.

In words, if the disutility from having a traditional husband is too large, all educated women will decide to stay single when matched to traditional men. On the other hand, if the disutility is small, then all women will choose to marry even when they are matched to traditional men. In the intermediate case where α_0 and α_1 satisfy equation (5), an educated woman's marriage decision changes as her outside option improves. I focus on this last, non-trivial case. Assume that equation (5) holds and that $\alpha_0 \leq \beta log 2$, so that α_1 is strictly larger than zero.

An implication of this search model is that when $w_E < \widetilde{w}_E$, women's marriage probabilities are invariant to the fraction of modern men in the marriage market because all women choose to marry. Thus, uneducated women always marry. When $w_E \geq \widetilde{w}_E$, however, educated women matched to traditional types do not marry because $\nu_f > V_{fT}$. An educated woman with a high enough wage need not tolerate a traditional husband for the sake of his income.

Therefore, the expected marriage probability p_i of uneducated (U) and educated (E) women can be expressed as in equation (6), given that educated women randomly draw wages from $W(.)$ with support $(2\beta, w_m)$.[32]

$$\begin{cases} p_U(\lambda_M) = 1 \\ p_E(\lambda_M) = \int_{2\beta}^{\widetilde{w}_E} 1 dW + \int_{\widetilde{w}_E}^{w_m} \lambda_M dW \end{cases} \tag{6}$$

Consequently, a woman's expected utility conditional upon her educational attainment can be expressed as:

$$\begin{cases} V_U(\lambda_M) = & \lambda_M V_{UM} + (1-\lambda_M) V_{UT} \\ V_E(\lambda_M) = & \int_{2\beta}^{\widetilde{w}_E} (\lambda_M V_{EM} + (1-\lambda_M) V_{ET}) dW \\ & + \int_{\widetilde{w}_E}^{w_m} (\lambda_M V_{EM} + (1-\lambda_M)\nu_f) dW \end{cases} \tag{7}$$

where V_{fj} and ν_f are as defined in equations (3) and (4).

[32]See Appendix B.1.2 for a discussion on how wages may instead be proportionate to the effort exerted such that a greater e generates a better wage distribution.

3.4 Education Decision

I assume that each woman faces an idiosyncratic effort cost e of becoming educated, where e is an iid random draw from a continuous cumulative distribution function $G(.)$. Let

$$\widehat{e}(\lambda_M) \equiv V_E(\lambda_M) - V_U(\lambda_M) \tag{8}$$

be the expected utility differential between an educated and uneducated woman given the fraction of modern men, λ_M. Because wages are exogenous, $\widehat{e}(\lambda_M)$ is independent of the fraction of women who decide to become educated.[33]

$\widehat{e}(\lambda_M)$ has the following properties:

Proposition 2. *$\widehat{e}(\lambda_M)$ is an increasing function of λ_M, and $\widehat{e}(\lambda_M) \geq 0$ always holds.*

Since all women with effort cost $e \leq \widehat{e}(\lambda_M)$ decide to invest in education, the equilibrium $\lambda_E(\lambda_M)$—fraction of educated women—at any point in time is:

$$\lambda_E(\lambda_M) = G(\widehat{e}(\lambda_M)) \tag{9}$$

It follows directly from Proposition 2 that $\lambda_E(\lambda_M)$ is also a continuous, increasing function of λ_M on $[0, 1)$. $\lambda_E = 1$ (and therefore $\lambda_M = 1$) is ruled out, because e can be unboundedly large. In words, more women find it worthwhile to invest in education when there is a larger fraction of modern men because marriage prospects are better. But it is never the case that all women become educated because there are always a few whose cost of investing in education is very high.

3.5 Shock to Women's Wages and the Gold Miss Phenomenon

There are equal numbers of men and women in the society. Let the number of educated women at period t be denoted as F_{Et}:

$$F_{Et} \equiv \lambda_{Et}(\lambda_{Mt})F_t \tag{10}$$

[33] I abstract from general equilibrium effects on wages.

where F_t is the total number of women at t. The conditional probability of being unmarried when educated (being a Gold Miss), is simply $1 - p_E(\lambda_{Mt})$, where $p_E(\lambda_{Mt})$ is the marriage probability of educated women as defined in equation (6).

$W_t(.)$ is the continuous cumulative distribution function of educated women's wages in generation t over support $(2\beta, w_m)$. The following comparative statics can be made with regards to contemporaneous wages:

Proposition 3. *Given $W_{t-1}(.)$ and λ_{Mt-1}, if the distribution $W_{t1}(.)$ first-order stochastically dominates $W_{t2}(.)$, $F_{Et1} \geq F_{Et2}$.*

Proposition 4. *Given $W_{t-1}(.)$ and λ_{Mt-1}, educated women's marriage probability is an increasing function of $W_t(\widetilde{w}_E)$. Hence if the distribution $W_{t1}(.)$ first-order stochastically dominates $W_{t2}(.)$, $p_{Et1} \leq p_{Et2}$.*

That is, both the number of educated women and the probability that they remain unmarried are increasing in educated women's current wages. Proposition 3 is straightforward; more women are incentivized to invest in education when the returns to education are greater. Proposition 4 results because women with wages higher than $\widetilde{w}_E$ can afford to stay single when matched to traditional men.

More important, however, is whether the probability of becoming a Gold Miss increases or decreases as wages rise *over time*, i.e. $p_{Et} - p_{Et-1}$.[34]

Proposition 5. *Suppose $W_t(.)$ first-order stochastically dominates $W_{t-1}(.)$ at all t. The decrease in p_E from $t-1$ to t is larger when (i) the drop in $W(\widetilde{w}_E)$ from $t-1$ to t is larger and (ii) the shift in $W(.)$ from $t-2$ to $t-1$ is smaller.*

That is, the Gold Miss phenomenon is more likely to arise in economies where there was a large, one-time shock to women's wages than in those that had a more gradual wage growth.

To understand why this is so, notice that wage increase affects p_E in two opposite directions. First, there is the contemporaneous effect: higher wages allow educated women to remain single when matched to traditional type and thus *lowers* marriage probability (Proposition 4). On the other

[34]Since uneducated women always marry, $p_{Ut} - p_{Ut-1} = 0$.

hand, more women have an incentive to become educated when wages are high (Proposition 3) and this generates a larger fraction of modern males in the next generation. This intergenerational effect *raises* educated women's marriage probability by increasing the pool of marriageable men. The second effect, unlike the first, is lagged.

Condition (i) in Proposition 5 enlarges the first effect whereas condition (ii) curtails the second, resulting in the Gold Miss phenomenon. But if either of the conditions fail to hold, the two opposing effects come into play and p_{Et} may fall only slightly relative to p_{Et-1}, or may even increase.

In sum, the Gold Miss phenomenon should be best observed when there is a shock to women's wages in a country with a large fraction of traditional men. The key observation is that the results do not depend on societies being endowed with different types of men. Even if all countries had equally traditional men at $t = 1$ and the same wage level at $t = T$, mismatch in the marriage market would be a function of how rapidly the economy grew *between* $t = 1$ and $t = T$. Therefore, similarly developed countries at $t = T$ can have very different gender norms, which in turn dictates the variation in the degree of mismatch we observe in the marriage market.

Finally, it is worth noting that this path dependency feature may result in prolonged repercussions, well beyond the arising of the Gold Miss phenomenon. Countries may become "stuck" in the Gold Miss equilibrium because as long as the Gold Misses do not have children, they cannot contribute to producing a new cohort of modern males (equation (1)). But if the fraction of modern men depends on the fraction of *all* educated women in the previous cohort (regardless of marital status), then the fraction of modern men would increase greatly after the Gold Miss generation.

4 Evidence on the Effect of Cultural Transmission on the Gold Miss Phenomenon

I focus my empirical exploration of the model on four testable implications. First, men who grew up around highly educated women are less traditional than those who grew up around less educated women. Second, husband's type affects household time allocation; a woman is more likely to work in the labor market when her husband is a modern type. Third, women marry less traditional men (rather than traditional) when they are available. Fourth (and as a consequence of the prior points), the Gold Miss phenomenon is less severe when there is a larger fraction of modern men in the marriage market.

The ideal way to test these predictions would be to exogenously vary wage growth paths or the composition of male types within an initially traditional country and then see how the marriage market unfolds generations later. Because this is not feasible, I use three different datasets—the Japanese General Social Survey, the U.S. Census and the American Community Survey, and the American Time Use Survey—to test the four elements above.

4.1 Gender Attitudes and Marriage Patterns in Japan

I first analyze the Japanese General Social Survey (JGSS) to evaluate how a mother's education and employment affect her son's gender attitudes and marriage patterns in one of the Gold Miss countries—Japan.

4.1.1 Data

The JGSS is designed to solicit political, sociological, and economic information from men and women living in Japan and has been conducted seven times during the 2000s.[35] I pool these years for the analyses. Respondents younger than 25 or still attending school are excluded in order to obtain more accurate data on final education. Appendix Table A1 contains descriptive statistics of the key variables.

4.1.2 Results

My model rests on the notion that gender norms are subject to change and that men's views of gender roles are influenced by their mothers. I investigate this using individual's responses to five questions in the JGSS specifically designed to capture gender attitudes.

Respondents are asked whether they agree or disagree with the following statements: "If a husband has sufficient income, it is better for his wife not

[35] 2000, 2001, 2002, 2003, 2005, 2006, and 2008. The sample size is about 3,500 per year.

to have a job," "Men should cook and look after themselves," "A husband's job is to earn money; a wife's job is to look after the home and family," "A preschool child is likely to suffer if his/her mother works," and "It is more important for a wife to help her husband's career than to have one herself." An individual can be defined as less traditional if he/she agrees with the second statement, and disagrees with the other statements.[36]

To investigate whether the mother-to-son transmission exists, I estimate the following linear probability model:

$$Y_{ist} = \beta_0 + \beta_1 X_{ist} + \beta_2 MomLFP_{ist} + \beta_3 MomColl_{ist} + \gamma_t + \delta_s + \varepsilon_{ist} \quad (11)$$

where the dependent variable Y_{ist} is an indicator variable that equals 1 if the response to the specific question (listed above) is less traditional for a man i who lives in region s and belongs to cohort t. $MomLFP_{ist}$ equals 1 if his mother had a paying job when he was about 15 years old, and $MomColl_{ist}$ equals 1 if his mother is a college graduate.[37] X_{ist} represents a set of demographic controls such as respondent's age, education, and income. In addition to regional and urban dummies δ_s, I include cohort fixed effects γ_t to take into account time trends.[38]

Table 1 contains the estimation results. The coefficients on having had a working and college graduate mother are always positive, and are statistically significant in cols. 1, 3, and 4. The probability that a man disagrees with the statements "If a husband has sufficient income, it is better for his wife not to have a job," "A husband's job is to earn money; a wife's job is to look after the home and family" and "A preschool child is likely to

[36]Responses to these five statements differ by sex and cohort. I find that women are always less traditional than men and the gap is larger in recent cohorts. Also, there has been a significant evolution of beliefs for both men and women over time. Those who were born after 1960 responded less traditionally to at least one or two more statements compared with those born in the 1920s.

[37]The JGSS asks "When you were about 15 years old, did your mother have any paying job? If so, what did she do?" $MomLFP_{ist}$ is zero for those who answered "She was not working." Respondents who "Don't know" or did not have a mother at that time are excluded. $MomColl_{ist}$ equals 1 for four-year colleges (not junior college or college of technology).

[38]There are 47 prefectures in Japan, which are governmental bodies larger than cities, towns, and villages. The prefectures are grouped into six regions ("blocks") in the JGSS. Urban is a set of three dummies for the size of municipality—largest cities, other cities, and town/village. Largest cities are the "Cabinet-Order designated cities" that have more than 500,000 people.

Table 1: Effect of Mother's LFP and Education on Gender Attitudes, Men in Japan

	Dependent variable=1 if less traditional				
View on:	Wife job	Men housework	Wife's role	Working mother	Wife career
	(1)	(2)	(3)	(4)	(5)
Mother's LFP at age 15	0.064***	0.019	0.043**	0.050***	0.017
	(0.019)	(0.015)	(0.019)	(0.019)	(0.019)
Mother college graduate	0.145**	0.012	0.104*	0.211***	0.080
	(0.062)	(0.039)	(0.062)	(0.054)	(0.060)
Father college graduate	-0.035	0.014	-0.025	-0.028	0.011
	(0.031)	(0.022)	(0.031)	(0.031)	(0.032)
College graduate	0.074***	0.057***	0.105***	0.051***	0.104***
	(0.019)	(0.014)	(0.019)	(0.019)	(0.020)
ln(Income)	0.006	-0.015	-0.007	-0.028**	-0.002
	(0.013)	(0.011)	(0.013)	(0.013)	(0.013)
Currently married	0.031	-0.045***	-0.006	0.024	0.076***
	(0.024)	(0.017)	(0.023)	(0.023)	(0.024)
Control for age	Yes	Yes	Yes	Yes	Yes
Rural at age 15 FE	Yes	Yes	Yes	Yes	Yes
Region and Urban FE	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes
N	3,890	3,576	3,883	3,865	3,554
Dependent variable mean	0.49	0.83	0.48	0.50	0.57

Notes. Effect of mother's LFP and education on gender attitudes, among men in Japan. Data are from the 2000–2008 JGSS. See Appendix A.3 for details. Each column refers to the following statements, respectively: (1) "If a husband has sufficient income, it is better for his wife not to have a job," (2) "Men should cook and look after themselves," (3) "A husband's job is to earn money; a wife's job is to look after the home and family," (4) "A preschool child is likely to suffer if his/her mother works," and (5) "It is more important for a wife to help her husband's career than to have one herself." The dependent variable equals 1 if the respondent either "Disagree" or "Somewhat disagree" to the statements (except for (2), where the dependent variable equals 1 if "Agree" or "Somewhat agree"). Mother's LFP at age 15 equals 1 if mother had a paying job when respondent was about 15 years old. ln(Income) is the log of total personal income (in 1999 yen). Region is a set of six dummies, and urban is a set of three dummies for the size of municipality. Birth cohort is grouped into six decennial periods, from 1920–1929 to 1970–1983. I exclude respondents under age 25 or enrolled in school at the time of the survey. Robust standard errors in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

suffer if his/her mother works" increases by about 5 percentage points if his mother worked relative to if his mother did not work when he was young and by more than 10 percentage points if his mother is a college graduate. These are comparable in magnitude to the marginal effect of the respondent himself being college graduate. Father's educational attainment, on the other hand, has no statistically significant effect. The results are robust to restricting the sample to currently married men.[39]

If men who had working and/or college graduate mothers are indeed less traditional, are they more likely to be married than men who had housewife mothers? And are their wives more likely to work after marriage? I find that the correlations between a mother's educational attainment and employment with her son's marriage probability and her daughter-in-law's LFP are indeed positive (see Appendix Table A2).

Altogether, these results suggest that a mother's work experience and educational attainment affect her son's gender attitudes and marriage. Consistent with the model's assumption on intergenerational transmission, men who had working and college graduate mothers are more likely to have egalitarian gender attitudes. The probability that a man ever marries and that he has a working wife also increases with his mother's LFP and education.

4.2 Time Use of Married Asians in the U.S.

We have just seen that Asian men are tradition-bound but are less so when their mothers are more educated and work outside the home. The supply of modern men in Asia is therefore limited. What happens when educated Asian women live in areas with more modern men? In this section, I explore time use of married Asians in the U.S. to see whether a husband's type—as proxied by his country of origin and U.S. nativity—affect his and his wife's time spent on household chores.

[39]When I replicate this analysis for *female* respondents, I find that both mother's LFP and mother being a college graduate do not have statistically significant effects on women's gender attitudes. Consistent with the model's assumption, the intergenerational transmission of gender attitudes matters more for men than women.

4.2.1 Data

I use the 2003–2011 waves of the American Time Use Survey (ATUS) to explore the time spent by respondents (and their household members) on both market and non-market activities. Using information on father's birthplace, I restrict my sample to respondents from the Gold Miss countries—Hong Kong, Japan, Korea, Taiwan, and Singapore.

For all analyses in this section, only married couples with spouse present are considered since couples who are currently separated or divorced do not face the same constraints in determining time allocation as couples living together. Couples with either respondent or spouse under age 25 are excluded. In comparing across generations, I distinguish between foreign born and second generation.[40] Appendix Table A3 contains the summary statistics of my sample.

4.2.2 Results

There are several ways to group non-market activities. I have chosen to use "core non-market work" in Guryan et al. (2008), which includes activities such as food preparation, indoor cleaning, and washing/drying clothes. Time spent on shopping, and other home production such as home maintenance, outdoor cleaning, vehicle repair, gardening, and pet care are excluded, as well as time spent on child care, medical care, education, and restaurant meals. Throughout, I refer to "core non-market work" as housework.[41]

According to the model, U.S. born Asian men are more likely to be modern type than foreign born Asian men because they have been exposed to U.S. gender norms and families from childhood. I estimate the following equation to investigate the effect of cultural background on men's house-

[40] All foreign born immigrants are categorized as foreign born regardless of their age at migration. There are no respondents who are foreign born yet with a U.S. born father in the sample, reducing the possibility of bias from adoptees. I also do not exclude those who have migrated to the U.S. as adults because unlike education and marriage decisions in Section 4.3 below, time use at home within married couples is an everyday practice, and thus is not contingent on the decisions made before coming to the U.S. Second generation is U.S. born respondents whose fathers are foreign born.

[41] All findings are robust to using a broader definition that includes other home production activities, such as "total non-market work" in Guryan et al. (2008).

work hours:

$$Y_{ist} = \beta_0 + \beta_1 X_{ist} + \beta_2 U.S.born_{ist} + \gamma_t + \delta_s + \varepsilon_{ist} \quad (12)$$

where the X_{ist} are demographic controls such as age, education, usual work hours, the number of children in household, and the age of the youngest child in household. γ_t and δ_s are year and state fixed effects, respectively.[42] The variable $U.S.born_{ist}$ equals 1 if the respondent is U.S. born and 0 if foreign born. Standard errors are clustered by father's birthplace.

Table 2 presents the estimates from the OLS regression. Despite the small sample size, the coefficient on U.S. born is large and highly significant. Relative to foreign born, Asian American men spend about four hours more on housework when the couple's demographics and working hours are considered (cols. 1 and 2) and 2.5 hours more when the number and age of children are considered as well (col. 3).[43]

Thus, U.S. born husbands spend more time on housework than traditional foreign born husbands, taking into account couple's demographics, working hours, and children. However, given that men earn higher wages than women in most families, the important distinction between modern and traditional type males may not be in their own housework hours but in how much they want the housework to be done by their wives. The model predicts that a woman married to a traditional husband does more housework than a woman married to a modern one, ceteris paribus.

Therefore, I investigate the effect of husband's cultural background on wife's housework hours, where I use female labor force participation (FLFP) rates in father's birthplace to divide countries into traditional and less traditional groups.[44] The United Nations (UN) provides data (from the

[42] Usual work hours are only available for individuals who are employed. I recode the variable to zero for those currently unemployed. Individuals who responded "hours vary" are excluded from the analyses. Race has 21 categories and includes multiple-race in addition to all major single race classifications.

[43] Hwang (2013) obtains similar results for men from countries with low female labor force participation (FLFP) rates in general. Unsurprisingly, the U.S. born effect is not statistically significant when the sample is restricted to men from countries with FLFP rates as high as that of the U.S.

[44] I can alternatively use mother's birthplace and the results are similar (95 percent of respondents have parents born in the same country). FLFP is commonly used in the political economy literature as an indicator of a country's family culture and women's economic status. See for example, Alesina and Giuliano (2010) and Fernández and Fogli

Table 2: Assimilation of Housework Time, Men from Gold Miss Countries

Dependent variable: Man's housework time (hours per week)	(1)	(2)	(3)
U.S. born	4.022***	4.246***	2.471**
	(0.706)	(1.204)	(1.154)
ln(Family income)	0.913*	0.330	0.493
	(0.497)	(0.435)	(0.383)
Usual work hours		-0.019	-0.007
		(0.013)	(0.009)
Wife's usual work hours		0.071***	0.079***
		(0.017)	(0.013)
No. of children under 18			-0.258
			(0.497)
Age of youngest child in household			-0.106**
			(0.045)
Control for age, educ	Yes	Yes	Yes
State and Year FE	Yes	Yes	Yes
N	131	116	80
Dependent variable mean	3.14	3.30	1.93

Notes. Effect of being U.S. born on housework hours, among married men whose father's birthplace is Hong Kong, Japan, Korea, Singapore, or Taiwan. Data are from the 2003–2011 ATUS. See Appendix A.4 for details. ln(Family income) is the log of family income (in 1999 dollars). Controls for both respondent's and husband's age and whether college graduate are included. I exclude respondents under age 25 or enrolled in school at the time of the survey. Standard errors are clustered by father's birthplace. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

International Labor Organization) on women's share of labor force in 187 countries starting from 1985. To focus on adult women's LFP and to obtain statistics for as many countries as possible, I use the FLFP rate of the 25–34 age group. I also use the oldest data available, 1985, to better reflect the gender norms that immigrants were exposed to before migrating to the U.S.

I define high (low) FLFP countries as *countries where women's LFP rates in 1985 were higher (lower) than that of the U.S.*—70.9 percent. U.S. is used as the standard since the shift in gender norms that immigrants experience derives from the contrast between their country of origin and the U.S. A total of 121 countries in the UN data are matched to father's birthplace in the ATUS sample, of which 42 countries are high FLFP and 79 are low FLFP. (See Appendix Figure A2 for a map of the countries by category.) The Gold Miss countries all belong to the low FLFP category.

The regression is similar to equation (12) but with husband's background as the key covariates, and standard errors clustered by husband's father's birthplace. Table 3 contains the estimation results. The size of the coefficients are large: husband's country of origin and U.S. nativity have marginal effects of more than five hours per week when considered separately (cols. 1 and 2). When both are included as covariates in col. 3, the average housework time of Asian women married to men from high FLFP countries is about four hours less than those married to men from low FLFP countries. The magnitude translates into more than a 25 percent drop in married women's housework time.[45]

These results are consistent with the prediction that variation in housework hours of married women can be partly attributed to husbands' cultural backgrounds. The type of men matters not so much because men do the housework but because they do not mind their wives' doing less and outsourcing more.

Furthermore, the findings above imply that cross-country differences in the substitutability between household production and market goods cannot be the main determinant of the Gold Miss phenomenon. As mentioned

(2009). For my purposes, married women's LFP rates would be ideal, but they are not available in cross-country datasets.

[45] I obtain similar results when I use the actual FLFP rate in the husband's father's birthplace instead of the dichotomous distinction of high and low FLFP origins.

Table 3: Effect of Husband's Country of Origin and U.S. Nativity on Housework Time, Women from Gold Miss Countries

Dependent variable: Woman's housework time (hours per week)	(1)	(2)	(3)
Husband low FLFP origin	5.983**		4.260*
	(2.446)		(2.544)
Husband U.S. born		-5.430**	-3.625
		(2.145)	(2.833)
U.S. born	-1.611	-2.994	-1.110
	(2.661)	(2.856)	(2.543)
Usual work hours	-0.146***	-0.095***	-0.146***
	(0.051)	(0.032)	(0.051)
Husband's usual work hours	0.215***	0.119	0.202***
	(0.073)	(0.086)	(0.067)
ln(Family income)	-4.736***	-3.777**	-4.849***
	(1.596)	(1.779)	(1.545)
No. of children under 18	3.854***	2.817**	3.651**
	(1.459)	(1.413)	(1.407)
Age of youngest child in household	0.381	-0.301	0.230
	(0.278)	(0.279)	(0.388)
Control for age, educ	Yes	Yes	Yes
State and Year FE	Yes	Yes	Yes
N	95	106	95
Dependent variable mean	16.88	16.51	16.88

Notes. Effect of husband's country of origin and U.S. nativity on housework time, among married women whose father's birthplace is Hong Kong, Japan, Korea, Singapore, or Taiwan. Data are from 2003–2011 ATUS. See Appendix A.4 for details. ln(Family income) is the log of family income (in 1999 dollars). Controls for both respondent's and spouse's age and whether college graduate are included. I exclude respondents under age 25 or enrolled in school at the time of the survey. Standard errors are clustered by husband's father's birthplace. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

in Section 2, not only are the relative prices of outsourcing housework in the U.S. and East Asia similar, but as shown here, there is a wide cultural variation in household time allocations even among those living in the same country.

4.3 Marriage Patterns of Koreans and Japanese in the U.S.

My research and others suggest that immigrants are culturally similar to those in their home countries and U.S. born men are less traditional than Asian born men.[46] Thus, immigration from the Gold Miss countries to the U.S. can demonstrate how the marriage market equilibrium would change when more modern males become available in Asia. I use the U.S. census data to examine whether the Gold Miss phenomenon similarly exists among Koreans and Japanese in the U.S., and if not, whom the women are marrying in the U.S.

4.3.1 Data

I use the 1980, 1990, 2000 Census and the 2001 to 2010 American Community Survey (ACS) IPUMS files.[47] A respondent is defined as Korean or Japanese if categorized as "Korean" or "Japanese" in the single race variable.[48] (Hong Kong, Taiwan, or Singapore is not recognized as single race categories. They are grouped as "Other Asian" or "Chinese.") Individuals younger than 25 or still attending school are excluded.

I distinguish between first and higher generations of immigrants. Because immigrants may have chosen to come to the U.S. after completing their final education in their home countries or getting married, bringing their spouses with them, I only use respondents who immigrated to the U.S.

[46] See footnote 8 for references on U.S. immigrants' cultural and economic assimilation.

[47] The Census and the ACS are the only datasets that have sufficiently large sample size to study the Koreans and Japanese in the U.S.

[48] The Census and ACS collect parent's birthplace only for respondents who live with their parents at the time of the survey (less than 5 percent of the adult population). Single race is assigned according to respondent's self-reported race in the survey and is comparable across all years and is available for all respondents (including those with multiple-race). Individuals with multiple-race are assigned to the single race category deemed most likely. However, multiple-race is extremely rare among Koreans and Japanese: 99 percent of Koreans and 98 percent of Japanese self-reported themselves as "Korean" or "Japanese" in the detailed race question (and not "Korean and White" or "Japanese and White," for instance).

when they were younger than 18 years old. I also exclude respondents who migrated before three years old to limit the bias from including Korean and Japanese adoptees.[49] Foreign born in this section refers to *immigrants who came to the U.S. between ages 3 and 17*. Second and higher generations are grouped as U.S. born.[50]

Appendix Table A4 reports the descriptive statistics of my sample. Foreign born are comprised of fewer Japanese because the wave of immigration from Korea has been more recent. Hence, I control for respondent's ethnicity in all my analyses.

4.3.2 Results

The percentage of four-year college graduates among Korean and Japanese women increased from less than 20 percent in the 1930s birth cohort to more than 60 percent in the 1980s birth cohort. Although there were more male college graduates in the early cohorts, the increase was more gradual for men, resulting in a switch in the educational gender gap.[51]

Hence, the Gold Miss phenomenon among Koreans and Japanese who immigrated to the U.S. may well be more severe because the sex ratio among college graduates in the U.S. is less in favor of women than in Korea and Japan, where there are more male than female college graduates. However, Figure 3 shows that college graduate Koreans and Japanese are as likely to be married as the non-college graduates. For both sexes, the fraction married among college graduates relative to non-college graduates

[49] See Appendix A.5 for how age at migration is calculated. Adoptees may be identified as Korean or Japanese in the Census despite having been brought up by American parents and not having any cultural connections to Korea or Japan. According to the Intercountry Adoption statistics from the U.S. Department of State, 99 percent of adoptees from Korea and Japan in 1999–2011 arrived in the U.S. when they were younger than three years old. The Holt International Children's Services data in Sacerdote (2007) also shows similar figures for Korean adoptees placed during 1964–1985: 91.4 percent of children arrived under the age of three.

[50] It is impossible to distinguish between these generations without information on parent's birthplace. Since the immigration wave from East Asia began in the 1960s (after the Immigration and Nationality Act Amendments of 1965), however, third or higher generations are expected to comprise a small fraction of my sample. Naturalized citizens are categorized as foreign born.

[51] The overall development across time is similar for the foreign born and the U.S. born. The fraction college graduate is larger among Koreans and Japanese in the U.S. than among white Americans (less than 40 percent).

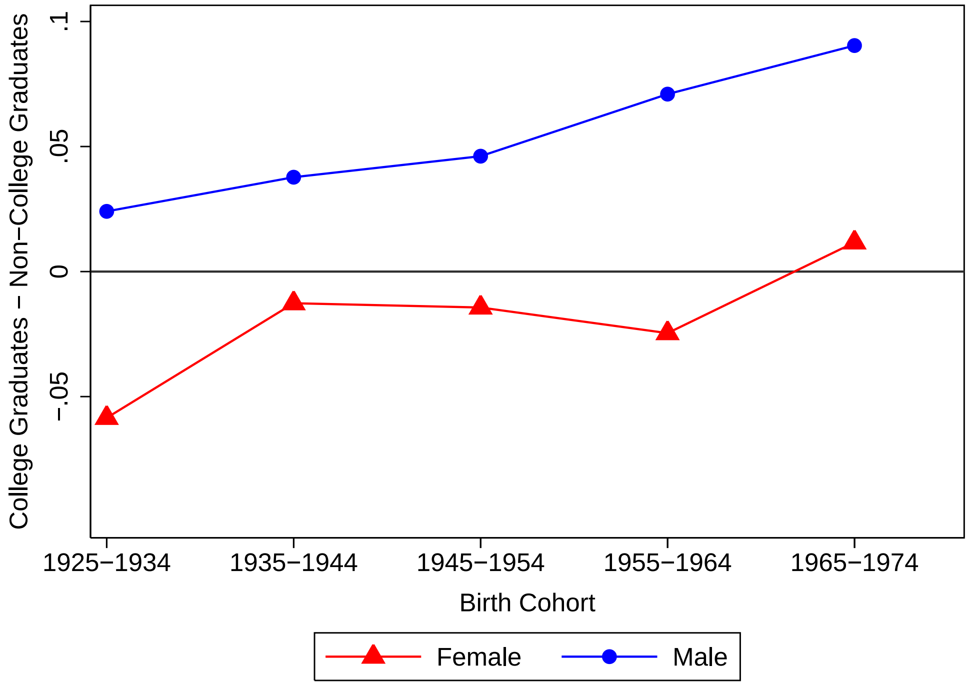

Figure 3: Difference in Fraction Ever Married Between College Graduates and Non-College Graduates, Koreans and Japanese Over Age 35 in the U.S.

Notes. Difference in the fraction ever married between college graduates and non-college graduates, among Koreans and Japanese in the U.S. over age 35 in each birth cohort. Data are from the 1980, 1990, 2000 Census and 2001–2010 ACS. I exclude respondents who have migrated to the U.S. under age 3 or over 17, or still attending school at the time of the survey.

has been increasing across cohorts, and the difference switched from negative to positive for women. This contrasts starkly with the downward trend found in Asia and is instead similar to the trend observed among Americans overall (see Figure 2). That is, the Gold Miss phenomenon does not hold in the U.S.

Because women's educational attainment, labor force participation, and wages increased decades earlier in the U.S. than in Asia, men who grew up in the U.S. have less traditional gender attitudes than those who grew up in Korea or Japan. College graduate women would then have greater options in the U.S. marriage market than in Korea or Japan.

This notion appears to have much validity. Among the college graduate

Table 4: Spouse's Ethnicity and U.S. Nativity, College Graduate Koreans and Japanese in the U.S.

	Panel A: Husband is:			
	KrJp Foreign born	KrJp U.S. born	Not KrJp Foreign born	Not KrJp U.S. born
Woman is:				
Foreign born KrJp	0.526	0.063	0.067	0.344
U.S. born KrJp	0.058	0.409	0.044	0.488
Total	0.187	0.314	0.051	0.449

	Panel B: Wife is:			
	KrJp Foreign born	KrJp U.S. born	Not KrJp Foreign born	Not KrJp U.S. born
Man is:				
Foreign born KrJp	0.722	0.068	0.052	0.159
U.S. born KrJp	0.125	0.452	0.068	0.355
Total	0.287	0.348	0.063	0.302

Notes. Fraction of spouses in each ethnicity and nativity group, among college graduate and married Koreans and Japanese (KrJp) in the U.S. Data are from the 1980, 1990, 2000 Census and 2001–2010 ACS. Foreign born spouse refers to non-U.S. born regardless of spouse's age at migration. Foreign born respondent only includes those who migrated to the U.S. between ages 3–17. I exclude respondents under age 25 or still attending school at the time of the survey.

and foreign born Koreans and Japanese, women are much more likely than men to have a spouse who is neither Korean nor Japanese (Table 4 Panels A and B, row 1). The gender gap is large: one third of these women married U.S. born who are not Korean or Japanese while only 16 percent of men did, and about half of the women married foreign born Korean or Japanese while more than 70 percent of men did.

The gender gap in spouse's ethnicity is smaller among the U.S. born Koreans and Japanese (Table 4 Panels A and B, row 2). The incidence of having a foreign born Korean or Japanese spouse falls to 6 percent for women and 12.5 percent for men. The vast majority of both sexes marry U.S. born—89 percent of women and 81 percent of men—although men tend to marry Korean or Japanese Americans while women tend to marry Americans who do not identify themselves as Korean or Japanese (mostly white Americans).[52]

[52]The differential marriage pattern by respondent's sex and U.S. nativity are robust

These findings suggest that Korean and Japanese men and women have different preferences for their spouse's ethnicity and U.S. nativity. Korean and Japanese men (particularly the foreign born) usually marry Korean or Japanese immigrants whereas Korean and Japanese women (even those who are foreign born) marry Americans.

To test whether women's inclination to marry out of their ethnic group can be explained by the Korean and Japanese men being more traditional than American men, I exploit regional variation in the composition of the Korean and Japanese male population. That is, for each state-cohort cell (six decennial birth cohorts and 51 states, including the District of Columbia), I calculate the fraction foreign born among Korean and Japanese men—number of foreign born Korean and Japanese men divided by the total number of Korean and Japanese men. A larger share means that there are more foreign born than U.S. born among the Korean and Japanese men in respondent's state-cohort.[53]

The estimating equation is the following linear probability model:

$$Y_{ist} = \beta_0 + \beta_1 X_{ist} + \beta_2 fracfb_{st} + \beta_3 total_{st} + \gamma_t + \delta_s + \varepsilon_{ist} \qquad (13)$$

where the dependent variable is an indicator variable that equals 1 if husband is not Korean or Japanese and 0 otherwise. The key covariates $fracfb_{st}$ and $total_{st}$ are, respectively, the fraction foreign born among Koreans and Japanese men and the total number of Koreans and Japanese men in the respondent's state s and cohort t.[54] The usual demographic controls are included. Cohort fixed effects absorb common time trends that may exist with regards to immigration from Asia or discrimination against interracial marriage. State fixed effects control for differences across states such as the type of industries and racial composition. Standard errors are clustered at the state-cohort level.

Table 5 presents the result of estimating equation (13) separately by

to including respondent's age, education, ethnicity, and state and cohort fixed effects.

[53]Pooling all state-cohort cells, the fraction foreign born among Korean and Japanese men ranges from 0 to 1 and has mean of 0.51 and standard deviation of 0.29. Hawaii and Idaho have low fraction foreign born whereas New Jersey and New York have high fraction foreign born among Korean and Japanese men.

[54]State here refers to the state of current residence. Note that state of birth cannot be used because of the foreign born group.

Table 5: Effect of Korean and Japanese Male Composition on Husband's Ethnicity, Korean and Japanese Women in the U.S.

	Dependent variable=1 if husband is not Korean or Japanese			
	College graduate KrJp women		Non-college graduate KrJp women	
	Foreign born	U.S. born	Foreign born	U.S. born
	(1)	(2)	(3)	(4)
Fraction foreign born, KrJp men	0.742***	0.573***	0.150	0.528***
	(0.222)	(0.127)	(0.252)	(0.121)
ln(Total number of KrJp men)	-0.259*	0.007	0.003	-0.106**
	(0.135)	(0.067)	(0.068)	(0.052)
Fraction foreign born, KrJp women	-0.119	0.261	-0.021	0.281
	(0.276)	(0.191)	(0.377)	(0.174)
ln(Total number of KrJp women)	0.010	0.031	-0.276**	0.156**
	(0.140)	(0.084)	(0.108)	(0.075)
Husband college graduate	-0.037	-0.035**	0.024	-0.049***
	(0.036)	(0.017)	(0.028)	(0.018)
Control for age, ethnicity	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes
N	2,965	10,817	2,414	14,108
Dependent variable mean	0.41	0.53	0.46	0.41

Notes. Effect of fraction foreign born among Korean and Japanese (KrJp) men in one's state and cohort on husband's ethnicity, among married Korean and Japanese women in the U.S. Data are from the 1980, 1990, 2000 Census and 2001–2010 ACS. Fraction foreign born among men (women) is the number of foreign born (regardless of age at migration) divided by the number of Korean and Japanese men (women) by state and cohort. State-cohort cells with no Korean or Japanese men (women) are excluded. ln(Total number of KrJp) is the log of the total number of Korean and Japanese men (women) by state and cohort. Controls for both respondent's and husband's age are included. Birth cohort is grouped into six decennial periods, from 1925–1934 to 1975–1985. I exclude respondents who have migrated to the U.S. under age 3 or over 17, who are under age 25, or still attending school at the time of the survey. Standard errors are clustered by state and cohort. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

education and U.S. nativity of Korean and Japanese women. The positive coefficient on fraction foreign born among Korean and Japanese men shows that the probability a Korean or Japanese woman marries out of her ethnic group increases when there are fewer U.S. born among the Korean and Japanese men in her state-cohort. Moreover, consistent with the model's assumption that the disutility from having a traditional husband is greater for educated women than for uneducated women, the coefficient is larger in magnitude for college women (cols. 1 and 2) than for non-college women (cols. 3 and 4).

The results are not driven by differences in the chance of meeting a Korean or Japanese of the opposite sex or the competition between Koreans and Japanese of the same sex in the marriage market; I control for both the total number of Korean and Japanese men and women in the respondent's state and cohort and also the fraction foreign born within the female population. The findings imply a causal relationship between a Korean or Japanese woman's decision to marry outside her ethnic group and the composition of men in her own ethnic group.[55]

One potential concern with the interpretation that Korean and Japanese women marry American men because they are modern is that American men might marry Korean and Japanese women expecting them to be obedient housewives. Another is that Korean and Japanese women might marry American men to "marry-up" in socioeconomic status. However, I find that Korean and Japanese women's probability of working after marriage is higher when the husband is not Korean or Japanese (see Appendix Table A5).[56] Moreover, non-Asian husbands do not have higher educational attainment than their wives relative to Asian husbands (see Appendix Table A6).[57]

In summary, female Korean and Japanese college graduates in the U.S.

[55] Repeating the analysis for Korean and Japanese men shows that the fraction foreign born among the Korean and Japanese women in respondent's state and cohort does not have a statistically significant effect. That is, Korean and Japanese men's preference for Asian wives do not respond sensitively to the composition of the female population.

[56] Using alternative definitions of work status, such as usual hours worked per week, yields similar results.

[57] Using the National Latino and Asian American Survey, Chen and Takeuchi (2011) similarly find that Asian women in the U.S. who marry non-Asians are not marrying-up in terms of education or occupation status.

are as likely to be married as are non-college graduates. In terms of spouse's type, Korean and Japanese women in the U.S. are much more likely to marry Americans than their male peers, particularly when the fraction of first generation immigrants is large within the Korean and Japanese male population. Korean and Japanese women's LFP after marriage and their education levels relative to their husbands' suggest that the observed marriage patterns are not driven by the selection of American men who want housewives or the marrying-up of Asian women.

5 Conclusion

The "East Asian tigers" transformed into developed economies in less than 50 years. Today, women's educational attainment and labor market performance in this region have become comparable to, or even surpassed those of other developed countries. In contrast to the U.S., however, marriage rates of college graduate women in Asia have become lower relative to that of non-college graduate women. The low marriage rates of college educated Asian women has been termed the "Gold Miss" phenomenon.

I argue that the Gold Miss phenomenon arises in traditional societies that underwent rapid growth in women's wages. Rapid improvement in women's economic status creates a gap between the women's role that men grew up observing and the role that the new generation of educated women choose to take. I test my hypothesis using data from Japan and the U.S. In Japan, I find that a mother's working status and educational attainment are positively correlated with her son's gender attitudes and his likelihood of having a working wife. In the U.S. time use data, I find that husbands from countries with low female labor force participation rates, like the Gold Miss countries, increase wives' housework burden. Finally, women from Korea and Japan—two major Gold Miss countries—have greater options in the U.S. marriage market because they can marry American men instead of Korean and Japanese men. Indeed, in the U.S., Korean and Japanese college women are as likely to be married as non-college women.

Overall, this paper provides an explanation for why the Gold Miss phenomenon arose in developed Asian countries and also identifies the driving forces behind the evolution of educated women's economic and household role.

References

Abraham, Katharine G., Sarah M. Flood, Matthew Sobek, and Betsy Thorn, *American Time Use Survey Data Extract System: Version 2.4*, Maryland Population Research Center, University of Maryland, College Park, Maryland, and Minnesota Population Center, University of Minnesota, Minneapolis, Minnesota, 2011. (http://www.atusdata.org).

Akerlof, George A. and Rachel E. Kranton, "Economics and Identity," *Quarterly Journal of Economics*, 2000, *115* (3), 715–753.

Alesina, Alberto and Paola Giuliano, "The Power of the Family," *Journal of Economic Growth*, 2010, *15* (2), 93–125.

_ , Nathan Nunn, and Paola Guiliano, "Fertility and the Plough," *American Economic Review Papers and Proceedings*, 2011, *101* (3), 499–503.

Becker, Gary S., *The Economics of Discrimination*, Chicago: University of Chicago Press, 1957.

_ , *A Treatise on the Family: Expanded Edition*, Cambridge: Harvard University Press, 1991.

Bisin, Alberto and Thierry Verdier, "Beyond the Melting Pot: Cultural Transmission, Marriage, and the Evolution of Ethnic and Religious Traits," *Quarterly Journal of Economics*, 2000, *115* (3), 955–988.

Blau, Francine D. and Lawrence M. Kahn, "Gender and Assimilation Among Mexican Americans," *NBER Working Paper No. 11512*, 2007.

Chen, Juan and David T. Takeuchi, "Intermarriage, Ethnic Identicy, and Perceived Social Standing Among Asian Women in the United States," *Journal of Marriage and Family*, 2011, *73* (4), 876–888.

Chiappori, Pierre-Andre and Oliver Donni, "Non-unitary Models of Household Behavior: A Survey of the Literature," in José A. Molina, ed., *Household Economic Behaviors*, Springer, 2011, pp. 1–40.

Cortes, Patricia and Jessica Y. Pan, "Outsourcing Household Production: Foreign Domestic Helpers and Native Labor Supply in Hong Kong," *Journal of Labor Economics*, 2013.

Fernández, Raquel, Alessandra Fogli, and Claudia Olivetti, "Mothers and Sons: Preference Formation and Female Labor Force Dynamics," *Quarterly Journal of Economics*, 2004, *119* (4), 1249–1299.

_ **and** _ , "Culture: An Empirical Investigation of Beliefs, Work and Fertility," *American Economic Journal: Macroeconomics*, 2009, *1* (1), 146–177.

Feyrer, James, Bruce Sacerdote, and Ariel Dora Stern, "Will the Stork Return to Europe and Japan? Understanding Fertility within Developed Nations," *Journal of Economic Perspectives*, 2008, *22* (3), 3–22.

Giuliano, Paola, "Living Arrangements in Western Europe: Does Cultural Origin Matter?," *Journal of the European Economic Association*, 2007, *5* (5), 927–952.

Goldin, Claudia, *Understanding the Gender Gap: An Economic History of American Women*, New York: Oxford University Press, 1990.

_ , "The Long Road to the Fast Track: Career and Family," *Annals of the American Academy of Political and Social Science*, 2004, *596*, 20–35.

_ **and Lawrence Katz**, "The Power of the Pill: Oral Contraceptives and Women's Career and Marriage Decisions," *Journal of Political Economy*, 2002, *110* (4), 730–770.

_ **and** _ , "Putting the "Co" in Education: Timing, Reasons, and Consequences of College Coeducation from 1835 to the Present," *Journal of Human Capital*, 2011, *5* (4), 377–417.

Greenwood, Jeremy, Ananth Seshadri, and Mehmet Yorukoglu, "Engines of Liberation," *Review of Economic Studies*, 2005, *72* (1), 109–133.

Guryan, Jonathan, Erik Hurst, and Melissa Kearney, "Parental Education and Parental Time with Children," *Journal of Economic Perspectives*, 2008, *22* (3), 23–46.

Hochschild, Arlie R. and Anne Machung, *The Second Shift: Working Parents and the Revolution at Home*, New York: Viking, 1989.

Huang, Shirlena, Brenda S. A. Yeoh, and Noor A. Rahman, eds, *Asian Women as Transnational Domestic Workers*, Singapore: Marshall Cavendish Academic, 2005.

Hwang, Jisoo, "The Second Shift: Housework Time Among Immigrants." PhD dissertation, Harvard University 2013.

Jones, Gavin W. and Bina Gubhaju, "Trends in Marriage in the Low Fertility Coutries of East and Southeast Asia," *Asian Population Studies*, 2009, *5* (3), 237–265.

Kalmijn, Matthijs, "Shifting Boundaries: Trends in Religious and Educational Homogamy," *American Sociological Review*, 1991, *56* (6), 786–800.

Kawaguchi, Daiji and Soohyung Lee, "Brides for Sale: Cross-Border Marriages and Female Immigration," *HBS Working Paper No. 12–082*, 2012.

Olivetti, Claudia and Eleonora Patacchini, "Mothers and Friends: Intergenerational Preference Transimission and Women's Work Choices," 2012. Unpublished.

Rubin, Lillian, *Intimate Strangers: Men and Women Together*, New York: Harper and Row, 1983.

Ruggles, Steven, J. Trent Alexander, Katie Genadek, Ronald Goeken, Matthew B. Schroeder, and Matthew Sobek, *Integrated Public Use Microdata Series: Version 5.0*, Minneapolis: University of Minnesota, 2010.

Sacerdote, Bruce, "How Large are the Effects from Changes in Family Environments? A Study of Korean American Adoptees," *Quarterly Journal of Economics*, 2007, *122* (1), 119–157.

Schwartz, Christine R. and Robert D. Mare, "Trends in Educational Assortative Marriage from 1940 to 2003," *Demography*, 2005, *42* (4), 621–646.

Stevenson, Betsey and Justin Wolfers, "Marriage and Divorce: Changes and Their Driving Forces," *Journal of Economic Perspectives*, 2007, *21* (2), 27–52.

Tanioka, Ichiro, Michio Nitta, Noriko Iwai, and Tokio Yasuda, *Japanese General Social Survey, 2005*, (ICPSR 4703), Ann Arbor, MI: Inter-university Consortium for Political and Social Research.

_ , Noriko Iwai, Michio Nitta, and Hiroki Sato, *Japanese General Social Survey, 2000, 2001, 2002, 2003*, (ICPSR 3593, 4213, 4214, 4242), Ann Arbor, MI: Inter-university Consortium for Political and Social Research.

_ , _ , _ , and Tokio Yasuda, *Japanese General Social Survey, 2006*, (ICPSR 25181), Ann Arbor, MI: Inter-university Consortium for Political and Social Research.

For Online Publication

A Data Appendix

A.1 Korean Data

The Korean Population Census is collected by the National Statistical Office every five years and are 2 percent samples of the population, excluding the institutionalized. Micro-data is available for years 1995, 2000, and 2005. The 2005 data does not distinguish between four-year colleges and less than four-year colleges, however, and hence I only use the 1995 and 2000 samples ($N = 1,756,493$). For the most recent cohorts, I use the Korean Economically Active Population Survey instead. It is collected monthly and covers individuals age 15 and older (both in and out of labor force) in Korea. I pool all months of 2012 ($N = 327,865$).

Korea's Time Use Survey is collected by the National Statistical Office and covers household members older than age 10 in 8,100 households nationwide. "Household Activities" corresponds to the same category in the Bureau of Labor Statistics time use data. Activities such as housework, food and drink preparation and clean-up, interior maintenance, exterior maintenance, vehicle maintenance, and household management are included. It does not include time spent on caring for children or other family members.

A.2 Hong Kong Data

The 2006 Hong Kong Population By-Census is collected by the Hong Kong Census and Statistics Department and is a 5 percent sample of the population ($N = 460,197$). Educational attainment is defined using the variable EDUCNH (highest level completed). The four groups corresponding to high school, junior college, college, and graduate school are: senior secondary, post-secondry (non-degree), post-secondary (degree), and graduate school. More specifically, senior secondary includes secondary forms 4 to 7; post-secondary (non-degree) includes various diploma courses and vocational training schools; post-secondary (degree) includes degree institutions; graduate level includes master degree, PhD, and other postgraduate courses.

A.3 Japanese Data

The JGSS has a variable WEIGHT to weight data for population estimates based on the Japanese Population Census. In the 2000–2005 datasets, this is produced by calculating the number of people which one respondent represents by taking into account sex (two categories), 10–year age group (six categories), region (six categories), and city or not (two categories). From 2006, the variable is produced by sex (two categories) and 10–year age groups (seven categories). In order to attach weights across survey years, I harmonize this variable so that weight is constructed from sex (two categories) and 10–year age group (six categories) for all years in my sample.

Income (SZINCOMX, SSSZINCM) reports the total annual income during the previous year (before taxes and other deductions) from main job. This is converted into 1999 yen using the Consumer Price Index adjustment factors. All top-coded values in each year are multiplied by 1.45.

In the 2008 survey, age is reported in intervals. I construct respondents' exact age by subtracting birth year (which is available across all years) from the year of the survey. Respondents under age 25 are excluded from the sample. However, birth year for spouse is not provided. Hence, I take the midpoint of each 10–year age group for the spouse. The intervals range from age group 20–29 to 90–99. Hence, spouses who are actually under age 25 may be included in the analyses.

To control for the number of children when analyzing married women's labor force participation, we need to know the number of children (under a certain age) who are currently living with the respondent. Total number of children (CCNUMTTL) variable in the JGSS, however, counts both those who left home or are deceased. Hence, I construct a variable that counts the number of children under 19 living with the respondent by compiling the age of each child (CC01AGE, CC02AGE, etc.) as reported by the respondent. Because child's age is categorical data in 10–year age groups, I use 19 as the cut-off (instead of 18, as in other datasets).

The Japanese Time Use Survey is conducted by the Bureau of Statistics and covers household members older than age 10 in 99,000 households nationwide. "Housework" is a separate category from "Child care" and "Nursing" and includes activities such as food preparation, cleaning, caring for family members other than children, keeping the family account, and visits to the public office on personal or family matters.

A.4 ATUS

I weigh all observations using the person weight (WT06) to make the sample representative. Family income (FAMINCOME) includes the income of all members of the household who are 15 years of age or older. Income includes money from jobs, net income from business, pensions, dividends, interest, Social Security payments, and any other monetary income received by family members. This is the only earnings information available on the self-employed as well. It is based on categorical data; I calculate the midpoint of the categorical variable. When top-coded ($75,000 from January to September in 2003 and \$150,000 thereafter), it is multiplied by a factor of 1.45.

Individuals whose father's birthplace (FBPL) is indicated as regions or continents, such as "Central America n.s." and "Africa n.s." are excluded from the analyses. For the countries that are named or grouped differently in the ATUS from the United Nations dataset, the following adjustments have been made (FBPL are assigned the LFP rate of the country in parenthesis): Czechoslovakia and Czech Republic (Czech Republic); Korea and South Korea (Republic of Korea); England, Scotland, Wales, United Kingdom, and United Kingdom n.s. (United Kingdom); Ireland and Northern Ireland (Ireland); Other USSR/Russia and USSR n.s. (Russian Federation).

A.5 U.S. Census and ACS

I weigh all observations using the IPUMS person weight (PERWT) to make the sample representative. Age at migration is calculated by subtracting the respondent's birthyear from the year of immigration variable. For cases when the year of immigration is given as intervals, I take the most conservative approach by using the last year in the bracket (to ensure that I do not include any immigrants who came to the U.S. when older than 17). Income (INCTOT) reports total pre-tax personal income or losses from all sources for the previous year. This is converted into 1999 dollars using the Consumer Price Index adjustment factors. All top-coded values in each year are multiplied by 1.45.

B Technical Appendix

B.1 Discussions

B.1.1 Disutility Term and Joint Maximization

Other things equal, assume that the disutility term is in men's utility function instead of women's. Then the utility of a married man of type M and T are:

$$\begin{cases} V_M(w_m, w_f) = \max_{0\leq t_m\leq 1} & \frac{1}{2}(t_m w_m + t_f w_f) + \beta log((1-t_m)+(1-t_f)) \\ V_T(w_m, w_f) = \max_{0\leq t_m\leq 1} & \frac{1}{2}(t_m w_m + t_f w_f) + \beta log((1-t_m)+(1-t_f)) \\ & -(\alpha_0 + \alpha_1(t_f)) \end{cases}$$

whereas a married woman's utility function is invariant to the type of husband:

$$V_f(w_m, w_f) = \max_{0\leq t_f\leq 1} \frac{1}{2}(t_m w_m + t_f w_f) + \beta log((1-t_m)+(1-t_f))$$

Given $w_m > w_f$, a married man always works $t_m^* = 1$. Unlike in Section 3.2, a woman's optimal time allocation, t_f^*, now does not depend on the type of husband: if $w_f > 2\beta$, she spends $1 - \frac{2\beta}{w_f}$ of her time on market activities and if $w_f \leq 2\beta$, she stays at home.

Since t_f^* is increasing in w_f, and men's disutility is also increasing in t_f^*, there is a threshold wage w_f where V_T drops below ν_m.[58] Hence, Gold Misses arise when traditional men reject educated women with wages above this threshold. (This contrasts with the model where educated women are *choosing* to remain single.) The expected utility from becoming educated ($V_E(\lambda_M)$) and the fraction of educated women (λ_E) thus *decrease* as women's wages rise over time.

Therefore, the model is not isomorphic to the case with the disutility term in men's utility function. In papers that study only married couples (and not whether to marry or not) or that do not focus on changes in women's wages over time (for example, Fernández et al., 2004) both setups may yield similar results.

Alternatively, the two cases may be isomorphic in a joint maximization framework. For example, let each married household maximize the following weighted average of husband's and wife's utility:

$$\max_{0 \leq t_m, t_f \leq 1} \theta U_m(c_m, h, t_m, t_f) + (1-\theta) U_f(c_f, h, t_m, t_f) \tag{14}$$

where $0 < \theta < 1$, c_i is consumption, h is household public goods, and t_i is defined as before. (Unmarried agent's utility function is defined analogously.)

Assume that time spent on market activity enters directly into the utility function because the disutility from working is smaller than the disutility from doing household chores. That is, in addition to earning market wage w_i, self-fulfillment, working conditions, and other fringe benefits from a job are higher than from staying at home.[59]

Hence, some function of t_i and t_j enters in the utility of agent i married to agent j, where the marginal utility from t_i, MU_{t_i}, is positive. For simplicity, assume $MU_{t_j} = 0$ for all women and modern men. That is, apart from the utility gain from increase in household income, there need not be any additional utility gain from one's spouse working versus staying at home.

Traditional men, however, are characterized by $MU_{t_j} \ll 0$. They get disutility from wife working. Thus, solving equation (14) given wages, a woman is more likely to be a housewife when her husband is traditional.

Furthermore, since the disutility from working is smaller than that from

[58] I abstract from the trivial case where the disutility is so small that everybody marries.

[59] Note that this does not imply that individuals enjoy working per se.

housework, a woman with a sufficiently high wage would choose to remain single when matched to a traditional man. When single, she can optimally outsource housework whereas when married to a traditional man, she has to do the less enjoyable housework due to her husband's disutility. Men always prefer to marry since with $w_m > w_f$, they always work in equilibrium.

B.1.2 Effort and Wage Distributions

Wages may be proportionate to the effort exerted such that a greater e generates a better wage distribution (in the sense of first-order stochastic dominance). That is, $W(w_f; e)$ would be a continuous cumulative distribution function with support $[0, w_m)$ where $W(w_f; e_2) \leq W(w_f; e_1)\ \forall w_f$ if $e_2 > e_1$.

Women differ in their costs of investing in education, $C(e)$. Each woman chooses e to maximize her expected utility:

$$\max_{e \geq 0} W(2\beta; e)V_U(\lambda_M) + (1 - W(2\beta; e))V_E(\lambda_M) - C(e)$$

where $V_U(\lambda_M)$ and $V_E(\lambda_M)$ are defined as in equation (7). Once a woman chooses her optimal e^*, she draws her wage from $W(w_f; e^*)$. If her wage is higher than 2β, she works in equilibrium. If her wage is lower, she becomes a full-time housewife.

The difference with my model is that by choosing e, each woman can directly affect the wage distribution from which she draws from. Since the support of $W(w_f; e)$ is $[0, w_m)$, there is a probability that even an educated woman draws a wage lower than 2β. Thus, women would be distinguished by their revealed wages instead of their education investment per se. Consequently, equation (9) would also be redefined, such that λ_E equals the fraction of women who draw wages above 2β. Marriage and household time allocation decisions are unaffected since they are functions of w_f, and not e.

This alternative setup would require one to define how e translates into different wage distributions and how that also interacts with the wage distribution exogenously changing over time.

B.2 Proofs of Propositions

Proposition 1. *When α_0 and α_1 satisfy equation (5), $\underline{w}_E < \widetilde{w}_E < w_m$. When they are larger, $\widetilde{w}_E < \underline{w}_E < w_m$. When they are smaller, $\underline{w}_E < w_m < \widetilde{w}_E$.*

Proof. $\underline{w}_E < \widetilde{w}_E$ holds if $\nu_f < V_{ET}$ at $w_f = \underline{w}_E$. $\underline{w}_E$ can be found from equating V_{UT} with V_{ET}. Plug in the expression for $\underline{w}_E$ to equations (3) and (4). The inequality with regards to α is: $\alpha_0 + \alpha_1 < \frac{1}{2}(w_m - \underline{w}_E) + \beta log2$

$\widetilde{w}_E < w_m$ holds if $\nu_f > V_{ET}$ at $w_f = w_m$. Plug in w_m to equations (3) and (4). The inequality with regards to α is: $\alpha_0 + \alpha_1 > \beta log2$.

When both inequalities above are satisfied, $\underline{w}_E < \widetilde{w}_E < w_m$. □

Proposition 2. *$\widehat{e}(\lambda_M)$ is an increasing function of λ_M, and $\widehat{e}(\lambda_M) \geq 0$ always holds.*

Proof. Since $\widehat{e}(\lambda_M)$ is defined as in equation (8) and $V_U{}'(\lambda_M) = \alpha_0$, we just need to show that $V_E{}'(\lambda_M) > \alpha_0$ holds.

$$V_E{}'(\lambda_M) = \int_{2\beta}^{\underline{w}_E} (V_{EM} - V_{ET})dW + \int_{\underline{w}_E}^{\widetilde{w}_E} \alpha_0 dW + \int_{\widetilde{w}_E}^{w_m} (V_{EM} - \nu_f)dW$$

Plugging in the equations for V_{EM}, V_{ET}, and ν_f from equations (3) and (4), the expression becomes:

$$\begin{aligned} V_E{}'(\lambda_M) =& \alpha_0 + \int_{2\beta}^{\underline{w}_E} (\frac{1}{2}w_E - \beta + \beta log(\frac{2\beta}{w_E}))dW \\ &+ \int_{\widetilde{w}_E}^{w_m} (\frac{1}{2}(w_m - w_E) + \beta log2 - \alpha_0)dW \end{aligned}$$

The first integral is non-negative when $w_E \geq 2\beta$. (It equals zero if w_E are all higher than $\underline{w}_E$.) By assumption (5) and that $\alpha_0 \leq \beta log2$, the second integral is positive. (It would equal zero if and only if $\alpha_0 = \beta log2$ and there is a discrete jump at $w_E = w_m$ such that $prob(\widetilde{w}_E \leq w_E < w_m) = 0$. Since $W(w_E)$ is a continuous cumulative function over $(2\beta, w_m)$, the latter condition cannot hold.) Hence $V_E{}'(\lambda_M) > \alpha_0$ and therefore $V_E{}'(\lambda_M) - V_U{}'(\lambda_M) > 0$.

Since $\widehat{e}(\lambda_M)$ is an increasing function of λ_M, it is sufficient to show that $\widehat{e}(0) > 0$. $\widehat{e}(0) = \int_{2\beta}^{\widetilde{w}_E} V_{ET}dW + \int_{\widetilde{w}_E}^{w_m} \nu_f dW - V_{UT}$. We know that $V_{ET} = V_{UT}$ when $2\beta < w_E \leq \underline{w}_E$, $V_{ET} > V_{UT}$ when $\underline{w}_E < w_E \leq \widetilde{w}_E$, and $\nu_f > V_{ET}$ when $w_E > \widetilde{w}_E$. Thus $\widehat{e}(0) \geq 0$ always holds. □

Proposition 3. *Given $W_{t-1}(.)$ and λ_{Mt-1}, if the distribution $W_{t1}(.)$ first-order stochastically dominates $W_{t2}(.)$, $F_{Et1} \geq F_{Et2}$.*

Proof. Given $W_{t-1}(.)$ and λ_{Mt-1}, λ_{Mt} is determined regardless of $W_t(.)$ (see equation (1)). $\widehat{e}(\lambda_{Mt}) = V_E(\lambda_{Mt}) - V_U(\lambda_{Mt})$. $V_U(\lambda_{Mt})$ is invariant to changes in w_E. So we just need to show that

$$\begin{aligned} V_E(\lambda_{Mt}) =& \int_{2\beta}^{\widetilde{w}_E} (\lambda_{Mt}V_{EM} + (1 - \lambda_{Mt})V_{ET})dW_t \\ &+ \int_{\widetilde{w}_E}^{w_m} (\lambda_{Mt}V_{EM} + (1 - \lambda_{Mt})\nu_f)dW_t \end{aligned}$$

is larger under $W_{t1}(.)$ than under $W_{t2}(.)$.

By definition of first-order stochastic dominance, $W_{t1}(\widetilde{w}_E) \leq W_{t2}(\widetilde{w}_E)$ and hence the probability weight on the second integral is relatively larger under $W_{t1}(.)$ than under $W_{t2}(.)$. Since V_{EM} is an increasing function of w_E and $V_{ET} < \nu_f$ when $w_E > \widetilde{w}_E$ (by definition of $\widetilde{w}_E$), $(\lambda_M V_{EM} + (1-\lambda_M)\nu_f)$ is larger than $(\lambda_M V_{EM} + (1-\lambda_M)V_{ET})$. Hence the probability weight on the larger term is larger under $W_{t1}(.)$ than under $W_{t2}(.)$.

The comparative statics follows directly from equations (9) and (10). □

Proposition 4. *Given $W_{t-1}(.)$ and λ_{Mt-1}, educated women's marriage probability is an increasing function of $W_t(\widetilde{w}_E)$. Hence if the distribution $W_{t1}(.)$ first-order stochastically dominates $W_{t2}(.)$, $p_{Et1} \leq p_{Et2}$.*

Proof. We need to show that $p_E(\lambda_{Mt})$ (as defined in equation (6)) is smaller under $W_{t1}(.)$ than under $W_{t2}(.)$. Given $W_{t-1}(.)$ and λ_{Mt-1}, λ_{Mt} does not change with regards to $W_t(.)$ (see equation (1)). $p_E(\lambda_{Mt})$ can be rewritten as $W_t(\widetilde{w}_E)(1-\lambda_{Mt}) + \lambda_{Mt}$. Since $\lambda_{Mt} < 1$, p_{Et} is an increasing function of $W_t(\widetilde{w}_E)$. □

Proposition 5. *Suppose $W_t(.)$ first-order stochastically dominates $W_{t-1}(.)$ at all t. The decrease in p_E from $t-1$ to t is larger when (i) the drop in $W(\widetilde{w}_E)$ from $t-1$ to t is larger and (ii) the shift in $W(.)$ from $t-2$ to $t-1$ is smaller.*

Proof. Condition (i): From Proposition 4, we know that $p_E(\lambda_{Mt})$ decreases in $W_t(\widetilde{w}_E)$ given λ_{Mt}. Hence a drop in $W(\widetilde{w}_E)$ from $t-1$ to t helps decrease educated women's marriage probability.

Condition (ii): By Proposition 3 and equation (1), we know that the increase in λ_M from $t-1$ to t is larger when the (first-order stochastically dominating) change in $W(.)$ from $t-2$ to $t-1$ is larger. Hence if there is a large positive shift in the wage distribution from $t-2$ to $t-1$, λ_{Mt} would be much larger than λ_{Mt-1}. This helps increase educated women's marriage probability since $p_E(\lambda_{Mt})$ increases in λ_{Mt} (see equation (6)) given $W_t(.)$.

Both (i) and (ii) are needed for the Gold Miss phenomenon to arise. If only condition (i) holds and there was a significant wage growth from $t-2$ to $t-1$, then even if there is a large drop in $W(\widetilde{w}_E)$ at t, p_E may not fall because there is now a larger fraction of modern type in the marriage market than at $t-1$. Conversely, if only condition (ii) holds and there is only a trivial change in $W(\widetilde{w}_E)$, p_E would not fall since a woman (matched to a traditional type) does not forgo marriage unless her wage is higher than $\widetilde{w}_E$. □

Table A1: Descriptive Statistics, JGSS Sample

	Men		Women	
	Mean	SD	Mean	SD
Birthyear	1953.28	(15.79)	1951.98	(16.72)
Age	50.29	(15.65)	51.58	(16.61)
College graduate	0.33	(0.47)	0.12	(0.32)
LFP	0.80	(0.40)	0.52	(0.50)
Ever married	0.82	(0.38)	0.89	(0.32)
Currently married	0.78	(0.42)	0.72	(0.45)
Mother's LFP at age 15	0.67	(0.47)	0.69	(0.46)
Mother college graduate	0.03	(0.16)	0.02	(0.15)
Father college graduate	0.11	(0.31)	0.10	(0.30)
Rural at age 15	0.45	(0.50)	0.43	(0.50)
N	7,317		8,569	

Notes. Means and standard deviations by sex. Data are from the 2000–2008 JGSS. See Appendix A.3 for details. LFP is an indicator variable that equals 1 if the respondent is in the labor force. Mother's LFP at age 15 equals 1 if mother had a paying job when respondent was about 15 years old. I exclude respondents under age 25 or enrolled in school at the time of the survey. All observations are weighted by the person weight.

Table A2: Effects of Mother's LFP and Education, College Graduate Men in Japan

Dependent variable=1 if:	Ever married	Wife works
	Men Over Age 35	Married Men
	(1)	(2)
Mother's LFP at age 15	0.033*	0.072**
	(0.018)	(0.030)
Mother college graduate	0.029	0.064
	(0.041)	(0.069)
Father college graduate	0.024	-0.038
	(0.023)	(0.037)
ln(Income)	0.090***	-0.084***
	(0.015)	(0.024)
Wife college graduate		0.055*
		(0.032)
No. of children under 19		-0.039**
		(0.016)
Control for age	Yes	Yes
Rural at age 15 FE	Yes	Yes
Region and Urban FE	Yes	Yes
Cohort FE	Yes	Yes
N	1,252	1,302
Dependent variable mean	0.91	0.49

Notes. Effect of mother's LFP and education on probability ever married and wives' LFP, among college graduate men in Japan. Data are from the 2000–2008 JGSS. See Appendix A.3 for details. Mother's LFP at age 15 equals 1 if mother had a paying job when respondent was about 15 years old. ln(Income) is the log of total personal income (in 1999 yen). Controls for respondent's and wife's (col. 2 only) age are included. Region is a set of six dummies, and urban is a set of three dummies for the size of municipality. Birth cohort is grouped into six decennial periods, from 1920–1929 to 1970–1983. I exclude respondents under age 25 or enrolled in school at the time of the survey. Robust standard errors in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A3: Descriptive Statistics of Married Respondents from Gold Miss Countries, ATUS Sample

	Men		Women	
	Mean	SD	Mean	SD
Year of birth	1958.32	(14.46)	1960.79	(13.55)
College graduate	0.81	(0.39)	0.61	(0.49)
U.S. born	0.16	(0.37)	0.15	(0.36)
LFP	0.85	(0.36)	0.53	(0.50)
Usual work hours	35.45	(19.56)	22.23	(24.66)
Spouse's usual work hours	15.68	(20.76)	35.43	(23.00)
ln(Family income)	11.03	(0.81)	10.95	(0.86)
No. of children under 18	0.99	(0.99)	0.86	(1.05)
N	116		163	

Notes. Mean and standard deviations by sex, among married respondents whose father's birthplace is Hong Kong, Japan, Korea, Singapore, or Taiwan. Data are from the 2003–2011 ATUS. See Appendix A.4 for details. Usual work hours are number of hours per week, and individuals who responded "hours vary" are excluded. ln(Family income) is the log of family income (in 1999 dollars). I exclude respondents under age 25 or enrolled in school at the time of the survey. All observations are weighted by the person weight.

Table A4: Descriptive Statistics of Koreans and Japanese in the U.S., Census and ACS Sample

	Foreign born		U.S. born	
	Men	Women	Men	Women
Year of birth	1967.71	1966.82	1950.77	1949.08
	(9.18)	(10.56)	(18.15)	(18.89)
College graduate	0.61	0.59	0.46	0.43
	(0.49)	(0.49)	(0.50)	(0.49)
LFP	0.93	0.86	0.73	0.64
	(0.26)	(0.34)	(0.45)	(0.48)
ln(Income)	10.60	10.10	10.47	9.98
	(1.05)	(1.19)	(0.99)	(1.08)
Ever married	0.69	0.73	0.74	0.80
	(0.46)	(0.44)	(0.44)	(0.40)
Currently Married	0.60	0.57	0.60	0.55
	(0.49)	(0.50)	(0.49)	(0.50)
Japanese	0.14	0.18	0.86	0.86
	(0.35)	(0.38)	(0.35)	(0.35)
Speaks English well	0.96	0.96	0.98	0.97
	(0.20)	(0.21)	(0.14)	(0.16)
Year of immigration	1978.43	1977.32		
	(9.52)	(10.67)		
Age at immigration	10.72	10.50		
	(4.35)	(4.54)		
N	7,189	7,366	45,238	44,794

Notes. Means and standard deviations by sex and nativity, among Koreans and Japanese in the U.S. Data are from the 1980, 1990, 2000 Census and 2001–2010 ACS. See Appendix A.5 for details. Foreign born only includes those who migrated to the U.S. between ages 3–17. LFP is an indicator variable that equals 1 if the respondent is in the labor force. ln(Income) is the log of total personal income (in 1999 dollars). "Speaks English well" is an indicator variable that equals 1 if the respondent "speaks only English," "speaks English very well," or "speaks English well" and 0 if "does not speak English" or "can speak English but not well." I exclude respondents under age 25 or still attending school at the time of the survey. All observations are weighted by the IPUMS person weight.

Table A5: Effect of Husband's Ethnicity and U.S. Nativity on LFP of Korean and Japanese Women in the U.S.

Dependent variable=1 if participate in labor force		
	Foreign born KrJp women (1)	U.S. born KrJp women (2)
Husband not KrJp	0.093***	0.002
	(0.026)	(0.010)
Husband U.S. born	-0.004	0.024
	(0.026)	(0.020)
Husband college graduate	-0.017	-0.027***
	(0.023)	(0.010)
ln(Husband's income)	-0.080***	-0.024***
	(0.010)	(0.005)
College graduate	0.110***	0.064***
	(0.022)	(0.010)
No. of children under 18	-0.037***	-0.009**
	(0.010)	(0.005)
No. of children under 5	-0.116***	-0.131***
	(0.017)	(0.012)
Control for age, ethnicity	Yes	Yes
State FE	Yes	Yes
Cohort FE	Yes	Yes
N	5,262	24,637
Dependent variable mean	0.66	0.63

Notes. Effect of husband's ethnicity and U.S. nativity on labor force participation, among married Korean and Japanese (KrJp) women in the U.S. Data are from the 1980, 1990, 2000 Census and 2001–2010 ACS. Controls for both respondent's and spouse's age are included. ln(Husband's income) is the log of husband's total personal income (in 1999 dollars). Birth cohort is grouped into six decennial periods, from 1925–1934 to 1975–1985. I exclude respondents who have migrated to the U.S. under age 3 or over 17, who are under age 25, or still attending school at the time of the survey. Robust standard errors in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A6: Marrying-Up?, Korean and Japanese Women in the U.S.

Dependent variable=1 if husband's education is higher than wife's		
	Foreign born KrJp women (1)	U.S. born KrJp women (2)
Husband not Korean or Japanese	-0.023	-0.016*
	(0.026)	(0.010)
Husband U.S. born	0.009	-0.022
	(0.026)	(0.018)
Husband's age	0.006***	-0.001
	(0.002)	(0.001)
Education	-0.150***	-0.134***
	(0.009)	(0.004)
Age	-0.006**	0.002
	(0.002)	(0.001)
Control for ethnicity	Yes	Yes
State FE	Yes	Yes
Cohort FE	Yes	Yes
N	5,379	24,928
Dependent variable mean	0.33	0.26

Notes. Husband's relative educational attainment, among married Korean and Japanese (KrJp) women in the U.S. Data are from the 1980, 1990, 2000 Census and 2001–2010 ACS. Educational attainment is divided into four groups: high school graduate or less, some college, four-year college graduate, and graduate and professional degrees. The dependent variable equals 1 if husband's education is higher than wife's by at least one step. Birth cohort is grouped into six decennial periods, from 1925–1934 to 1975–1985. I exclude respondents who have migrated to the U.S. under age 3 or over 17, who are under age 25, or still attending school at the time of the survey. Robust standard errors in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

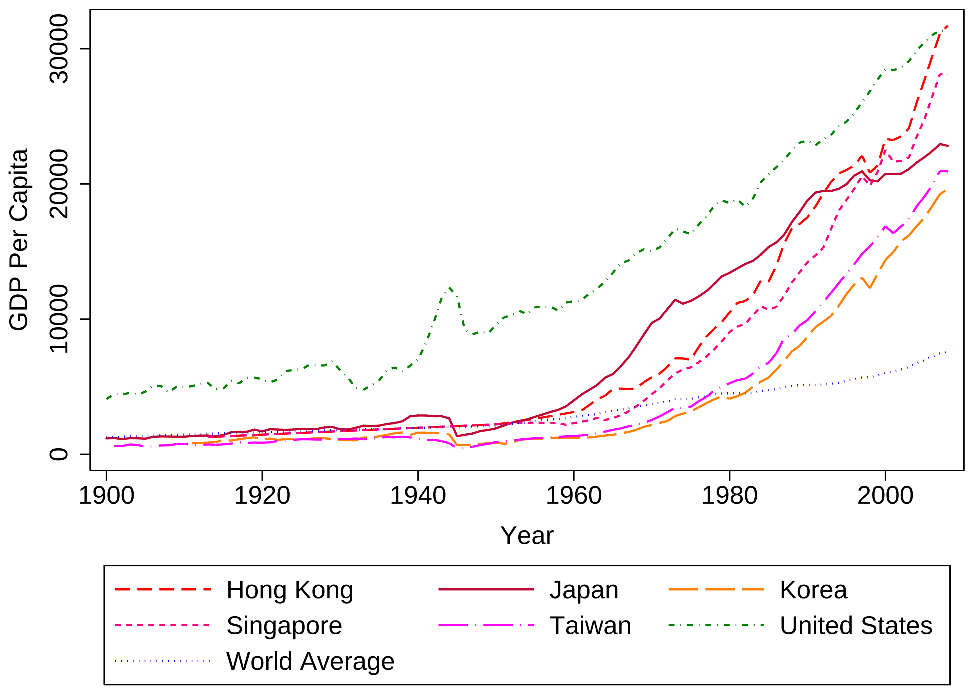

Figure A1: GDP Per Capita Trends of Developed Asian Countries

Notes. GDP per capita measured in 1990 international (Geary-Khamis) dollar units. Data are taken from Angus Maddison's Historical Statistics of the World Economy.

Figure A2: Countries by Female Labor Force Participation Rates in 1985

Notes. High and low female labor force participation (FLFP) countries. FLFP data are from the United Nations (UN) and are matched to father's birthplace in the ATUS sample. See Appendix A.4 for details. Father's birthplace is defined as high (low) FLFP if labor force participation rates of women in age group 25–34 were higher (lower) than that of the U.S. in 1985. Total of 121 countries in the UN data are matched to the ATUS sample—42 high FLFP (light gray) and 79 low FLFP (dark gray). Unmatched countries (either because they do not have data on FLFP or because they are not available as father's birthplace in the ATUS) are in white.