Schooling down to Marry up: Marriage norms and educational investments

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Abstract

In this paper, I explore the effect of older males' and females' education on younger cohorts' education in the United States. I use US Census and ACS data from 1940-2016 and exploit the differences in schooling levels among different ethnicities as a source of variation in the pool of skills among potential partners. I find that older men's education correlates more strongly compared to older women's with females in younger cohorts. I develop a model of pre-marital investments in education to explain the above results. Agents derive utility from labor market returns and marriage market returns to education. Due to society's preference that women marry up, the model proposes that women experience lower utility from getting 'too much' education because of a lower probability of finding a preferred partner. When there are more high-education men around, women respond by increasing their education because of a loosening of their constraint. The

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model also predicts that high-skill women will be less affected by the change in men's education than low-skill women.

Keywords: gender norms, education, marriage norms, culture, inequality, ethnicity, hypergamy

JEL code: I2, I23, I24, I26, I29, J16, J24, Z1

1 Introduction

Differences in cultural norms for men and women have consequences that may lead to very different labor and marriage market outcomes for each gender, despite being in the same percentile of the distribution of human capital. More years of schooling imply better earnings potential as well as improved marriage prospects for men. Women also find their earnings potential rise with more years of schooling. However, their marriage prospects may not show the same positive return. In light of the above argument, it is natural to ask how women, as forward-looking agents, optimize pre-marital investments in human capital, specifically education. In this paper, I explore the effect of the marital norm of hypergamy (the practice of women 'marrying up' by caste, age, education or any indicator of economic well-being) on women's education. I test the implications of the model for women's education in the United States.

Women may be facing a constrained decision regarding education choice. On the one hand, more education improves earnings and expected quality of potential spouse. On the other hand, it reduces the likelihood of finding a 'suitable' partner. Given the labor market - marriage market trade-off, one would expect that a change in men's education in one period would affect women's education, on average, more than men's in the next period. This is because the impact through channels such as the labor market, role-model, and peer effects would be the same in the same labor market on both genders. However, women would be affected via the marriage market effect of the marrying-up norm as well.

The process of getting this tradeoff right influences the choice of education for women. As a result, the 'optimal' education for women may be lower in the presence of gender norms such as hypergamy. To find empirical evidence in support of this argument is challenging, to

say the least. One possible identification strategy is to find a source of exogenous variation in the marriage market and see its impact on women's education choices in the relevant market. In this paper, I examine the impact of an exogenous change in the human capital pool of men on the human capital pool of young women in the United States. The source of variation is the changing composition of men and women in the United States due to changes in immigration policy or variations in the influx of immigrants from different countries of origin. Such changes have been documented to have altered the demographic and skill-pool in the US considerably for birth cohorts between 1910-1990.

I find evidence of a strong positive relationship between older men and younger women's college graduation rates. There is little or weaker corresponding evidence of the effect of older women's college graduation rates on younger women's graduation rates. This result is suggestive of hypergamy and its dragging effect on women's education. The increase in the proportion of men with higher education potentially relaxes the constraint on women's education.

While changes in the United States' immigration policies provide a credible reduced form effect on native women's education relative to men, these could be driven by other gender-specific changes in the economy. To overcome this issue, I look directly at the association between men's education in older cohorts with that of women in younger cohorts. I find a positive and significant association between college graduation rates of men and the graduation rates of younger women. There is no good way to separately identify the role of the marrying-up norm versus the role-model effects of older generations. However, one imperfect way is to look at the association between older and younger women's graduation rates. Using different lag terms and their combinations, I find a consistent pattern of a positive but smaller association between older and younger women's college graduation rates. The same pattern is not evident for total years of schooling or high-school graduation rates, where older women have similar or stronger association with younger women's education.

These results help shed more light on the determinants of educational outcomes and a potentially important source of difference in labor market outcomes between men and women. Marital outcomes are an important part of the return to education for many people largely due to the selection of the quality of spouse (in other words,

making oneself attractive). For women, roughly half of the correlation between education and consumption operates through the marriage channel (Lefgren & McIntyre, 2006). If women obtain less education than is 'optimal' with respect to their ability, they receive lower utility from both lower earnings and potentially lower quality of spouse. It may be a sub-optimal outcome for society as well if women are unable to contribute to the economy to their full potential. On the other hand, if women acquire 'too much' education, they experience a marriage squeeze (Qian, 2012), higher likelihood of divorce (Bertrand et al., 2015) or a skill penalty (Abendroth et al., 2014; Aisenbrey et al., 2009; Bertrand et al., 2016). As a result, many women drop out of the labor force after getting married or having children. Getting this trade-off right may imply choices that reduce earnings, like reporting lower ambitions to potential employers (Bursztyn et al., 2017) or less working hours (Bertrand et al., 2015).

While the evidence is reassuring for the theory here, it should not yet be considered causal. Other factors could also drive the same empirical results, such as lagged effects of economic development on women in certain industries. For example, if men are able to respond to advances in technology in certain sectors faster than women by acquiring the requisite education or skills sooner, then we may get a positive stronger association older men's and younger women's education compared to that between older and younger women.

The remaining paper is organized as follows. I discuss closely related literature, followed by a model of education choice in the presence of hypergamy. The main theoretical proposition is tested in the subsequent sections. The final section concludes.

2 Literature

Cultural norms and identities have been shown to affect economic behavior in a variety of ways. For example, highly qualified female graduates drop out of the labor market after marriage or childbirth in both developing and developed economies (Goldin & Katz, 2008; Shamsi, 2015) - a result known as 'opting out' in the literature. Women may feel less interested in pursuing Science, Technology, Engineering, and Math (STEM) fields in order to avoid the conflict with traditional communal roles (Diekman et al., 2010). If gender imbalances in education and

labor market outcomes are a result of constraints stemming from cultural identity or gender stereotypes, then weakening those constraints may be critical to correcting those imbalances.

This paper relates to the literature on pre-marital investments in education. Such investments could be substitutes (when maximizing a joint marriage output) or complements (Chiappori et al., 2009; Lafortune, 2013). The findings in this paper add another rationale to the theory of complementarity between spouses' pre-marital education investments. Several studies in economics find lowered prospects of marriage for women in the right tails of the education distribution (Bertrand et al., 2016; Hwang, 2015; Qian, 2012; Rose, 2005). This paper also relates to the large social sciences literature that documents too much education as a source of penalty for women in the marriage market (Eagly & Wood, 2013; Wood & Eagly, 2012; Zentner & Mitura, 2012).

Two studies that complement the analysis in this paper are Bertrand et al. (2015) and Bursztyn et al. (2017). Bertrand et al. (2015) finds that married women in the US reduce their working hours to keep their incomes less than their husband's, a result corroborated by Wieber & Holst (2015) for Germany. Bursztyn et al. (2017) demonstrate results from a field experiment showing that unmarried women report reduced ambitions, such as number of weekly working hours and monthly travel days, in the presence of other men, relative to married women. They argue that career ambition traits, which are rewarded in the labor market, are regarded negatively in women in the marriage market.

Several studies have examined the change in sex ratios in the marriage market and its impact on education and marriage outcomes for men and women (Angrist, 2002; Lafortune, 2013; Lefgren & McIntyre, 2006). These studies find that a high sex ratio, i.e., relative numbers of men and women, increases women's bargaining power and reduces their labor force participation rates. While changes in the total number of men available for marriage have important consequences for women's education and labor market outcomes, in many cases the total number of 'marriageable' men may be of more relevance. A few studies account for the availability of 'marriageable' men when looking at marriage rates in the economy[1].

[1]See Sawhill & Venator (2015) for a summary of the literature and definitions of marriageability used for men and women in the United States.

However, none of the studies account for the (human capital) quality of men relative to women in the marriage market as a factor in women's educational decision-making. It is conceivable that in many cases, it is not the total number of men that affects a woman's educational choice, but the number of men she would prefer to get married. For example, in the presence of hypergamy, women's schooling choices resulting from a large influx of low-skilled men should be very different from that of highly skilled men. Therefore, policies that fail to take into account cultural attitudes may achieve little towards their goal of gender parity.

The next section develops a model of educational attainment in the presence of a preference for marrying-up by women. The results from the model are used to derive testable implications for the US economy.

3 Women's Education with Hypergamy: Model Setup

Here, I discuss a brief model that helps understand the relationship between women's and men's education through norms of marriage. The idea is as follows: if getting more education reduces the probability of women finding 'suitable' partners, then they will restrict their schooling up to the schooling level of their expected potential partner. An increase in men's schooling level increases the schooling level of women's expected potential partner, thereby relaxing their constraint and leading to an increase in women's level of schooling.

3.1 Agents

Let g be the gender of an agent, with $g \in G = \{m, f\}$. Let each agent belong to an ethnicity r, with $r \in R = \{H, M, L\}$. Here high (H), medium (M) and low (L) denotes the average level of men's schooling in each ethnicity. There is a continuum of agents in each ethnicity and gender group, $i|r, g$, with $i \in I|r, g = [0, 1]$.

3.1.1 Schooling

The level of schooling of an agent i, in number of years or college graduation, is denoted by s_i. Let $F(s|r, g)$ be the distribution of schooling among agents in ethnicity r and gender group g.

All analysis will be done for gender groups in the same ethnicity until section 3.3. Hence, I will suppress the ethnicity subscript r for brevity.

3.1.2 Productivity and the Labor Market

Each agent's productivity is denoted by A_i. The labor market earnings net of schooling costs are given by $\lambda_{ig}(s)$, where

$$\lambda_{ig} = A_i * s_{ig} \tag{1}$$

3.2 Preference: Norms of Marriage

Endogamy: agents prefer to marry within their own ethnicity. This implies that when making pre-marital investments in their schooling, agents optimize based on the expected schooling level of the opposite sex in their own ethnic group. Table (1) shows the prevalence of endogamy by race for the United States.[2][3]

Marrying-up: I assume that society prefers couples where the male partner is more educated than the female partner. This implies that a woman finds men with schooling higher than her more attractive than men with schooling less than her own.[4] For a given woman, I refer to the set of men with more schooling than hers as the 'preferred set' of men. Likewise, for a given man, the 'preferred set' of women consists of all women in his ethnicity with schooling lesser than his.

[2]One could also justify such optimization based on information frictions. If people grow up around people from the same ethnicity or grow up hearing about people in their families who belong to the same ethnicity, their ideas about the distribution of schooling for either sex will come predominantly from people in their own ethnicity.

[3]Owing to rising levels of inter-ethnic marriages in the U.S., one could relax this assumption by adding a disutility component for 'distance in identity'. The more the distance from one's own identity (ethnic), the more an agent needs to be compensated in terms of additional schooling of the expected spouse. See Banerjee et al. (2013) for estimates of the tradeoff between schooling and caste for men and women in West Bengal, India.

[4]One could argue that the preference for marrying-up is multi-dimensional, with earnings, age and height being important factors other than education. As years of schooling are positively correlated with earnings, and education is associated with status, years of schooling can be a seen as a determinant of marrying-up (direct impact) and as a proxy for earnings and status(indirect impact).

3.3 Matching Probability in Marriage Market

Let $P(\cdot)$ denote the probability of meeting the 'preferred' prospective spouse. Given the preference for marrying up, a woman would like to match with a man such that $s_m \geq s_{if}$. Thus, the probability that a woman with schooling level s_i is matched with a man in her preferred set (say P_i) can be computed to be

$$P_i = 1 - F(s_i|m) \tag{2}$$

where $F(\cdot|m)$ is the cumulative distribution function of schooling among males. The probability of matching is increasing in the proportion of men with education higher than one's own.

3.4 Consumption

In the case of no marriage, each agent consumes their own earnings in the labor market, λ_{ig}. In the case an agent gets married, I assume that each agent shares her earnings equally with her spouse. Let s^A_{im} be the schooling level of the male partner a woman with schooling level s_{if} *aspires* to marry from within her preferred set. For notational convenience, I denote the productivity of this aspirational partner of woman i as B. A person's aspirations could reflect and capture several factors such as upbringing, location, personality, etc. Then the earnings available to the woman for consumption in this couple will be the average earnings of the couple from the labor market

$$\bar{\lambda}_{ig} = \frac{A_i * s_{if} + B * s^A_{im}}{2}$$

3.5 Utility

I assume that agents derive utility from consumption and finding a partner and all earnings are fully consumed. If an agent succeeds in finding a partner/spouse, she consumes the average earnings of the couple. She also derives intrinsic utility from being in the partnership.[5] If the agent fails to be matched with a suitable partner from her 'preferred set', she consumes her own earnings from the labor market.

[5]It is important to add this intrinsic utility for modeling the men's side of the decision-making process in future extensions. Without this added utility, men who earn more than their spouse will prefer to not enter the partnership.

Each agent has the following utility function:

$$U_{ig} = P_i(\bar{\lambda}_{ig} + \mu) + (1 - P_i)\lambda_{ig} \tag{3}$$

where μ is the utility derived from being in a domestic partnership. For a representative female i, her utility is a function of her own schooling and productivity, her potential spouse's schooling and productivity, and the distribution of schooling among males in her ethnicity:

$$U_{if} = (1 - F(s_{if}|m)) * \left(\frac{A_i * s_{if} + B * s_{im}^A}{2} + \mu\right) + F(s_{if}|m) * A_i * s_{if}$$

3.6 Optimal pre-marital investment in schooling

Each agent decides her schooling level to maximize utility. I assume that investments in education are made before a match in marriage is realized. Both men and women make optimal investments in schooling based on utility expectations from the labor and marriage markets. Thus, each agent is part of a two-stage game:

[1st]: Pre-marital investments in education are made based on labor market returns and the distribution of men's schooling.

[2nd]: The matching process concludes. In case of no match, agents consume their own earnings. In case of a match, earnings from the partnership are consumed.

I solve the game using backward induction. The objective function for a female is given by:

$$U_f = (1 - F(s|m,r))*\left(\frac{A * s_f + B * s_m^A}{2} + \mu\right)+(F(s|m,r)*A*s_f \tag{4}$$

Maximizing the utility with respect to s_f, the optimal level of schooling for females is given by

$$s_f^* = \frac{B * s_m^A + 2\mu}{A} + \frac{(1 + F_m(s_f^*))}{f_m(s_f^*)} \tag{5}$$

If there is an influx of men with more schooling than s_f^*, then $1-F_m(s_f^*)$ goes up, ceteris paribus.[6]

Similarly, the results are the opposite for a representative male with respect to changes in women's schooling distribution. I ignore the men's side of the market in the subsequent analysis for a focussed exposition of the main results above.

3.7 Comparative Statics

Proposition 3.1. *Female schooling (s_f^*) increases with an increase in $1 - F(s_f^*)$, the proportion of men with schooling level greater than s_f^*.*

Proof. As evident from equation (5), an increase in the proportion of men with schooling level higher than s_f^* implies that $F(s_f^*)$ becomes smaller, ceteris paribus.

$$\frac{\partial s_f^*}{\partial F_m} < 0$$

□

The above condition is similar to saying that the distribution's location shifts to the right while it's shape remain the same.

Proposition 3.2. *Female schooling (s_f^*) increases with an increase in the schooling of the aspirational partner.*

Proof. Female schooling increases with an increase in the schooling of the aspirational partner:

$$\frac{\partial s_f^*}{\partial s_m^A} = \frac{B}{A} > 0$$

□

This condition states that, given the same distribution of males' education, women who want to marry more educated men will acquire more schooling than women who do not have such aspirations.

Proposition 3.3. *Female schooling is less responsive to the aspirational spouse's schooling when her own productivity is higher*

[6]The height of the pdf at s_f^* need not change due to the influx of more educated men, and if it does, the direction of the change can go either way. This is because if $1 - F$ increases, the overall shape of the pdf will change to accommodate the increase and keep the area under the curve unity.

Proof. The cross-partial derivative of a representative female's schooling level with respect to her aspirational partner's schooling and her own productivity is negative

$$\frac{\partial^2 s_f^*}{\partial s_m^A \partial A} = -\frac{B}{A^2} < 0$$

□

This result states that more productive women are less affected by their potential spouse's expected schooling level. It helps explain the presence of highly educated women who decide to stay single.

4 Testing the model

In this section, I take proposition (3.1) to the data to see if changes in the distribution of men's schooling affect younger women's schooling in the expected direction. I look at the effect of a change in the pool of educated men and women from different countries of origin on US-bon men and women using two methods. In the first method, I look at a reduced form of the model by using the American Immigration and Nationality Act of 1965 to instrument for the schooling levels of older cohorts. The Act (as I will refer to it hereafter) removed quota restrictions by country of origin from several Eastern European, Asian, African and South American countries. The new American immigration policy prioritized either high-skill immigrants or the kin of U.S. citizens. These two channels had very different effects on the pool of skilled men and women coming from different countries. The skilled-immigration or work visas channel increased the proportion of people with higher education in the US. On the other hand, there is evidence of negative selection in education for those who immigrated based on family connections (Van den Berg & Bodvarsson, 2009). Refer to summary statistics by country of origin to see variation in schooling levels for men and women belonging to the biggest immigrant groups over the US in the last 100 years.

In the second method, I look at the effect of interest more directly by studying the correlation between older generations's education levels on younger women's education. By controlling for year by country-of-origin fixed effects I am able to rule of potential endogeniety concerns arising from different time-trends for men and women belonging to different ethnicities.

4.1 Data

The data for this study comes from U.S. Census 1940 - 2000 and ACS samples 2001 - 2016 (Ruggles et al., 2018), 5% where available, 1% otherwise. The relevant information on schooling level, citizenship, country of origin, gender, and age are available in this dataset. Additionally, there is also information on income, ethnicity, language and marriage.

To construct the dataset, I pool data from 1940, 1950 (1% samples), 1960 (5% sample), 1970 (1% metropolitan form 2), 1980, 1990 (5%), 2000 (5%) and ACS 2001-2016 1-year samples. This is a repeated cross-section data. I convert the individual-level data into cohort-level data, following Browning et al. (1985) and Deaton (1985). Although individual education levels cannot be tracked over time in the census data, it can be done for cohorts of individuals. I construct a pseudo-panel dataset by sorting individuals by year of birth.

I divide each cohort by gender and country-of-origin group. Countries-of-origin were chosen based on the list of countries exporting the largest number of people to the United States in the last 100 years. The country-of-origin groups are discussed in detail in Appendix Section (A). Each observation then is made up a group of individuals in the same birth cohort, of the same gender, and from the same country-of-origin. I use three types of birth cohorts - year of birth (for example, persons born between 1984 and 1985), quinquennial of birth (for example, persons born between 1980 and 1985), and decade of birth (for example, persons born between 1980 and 1990). Cohort bins with more years of birth help visualize smoother graphs whereas cohort bins with less years of birth offer more variation and hence more power.

While a student could complete 16 years of schooling (12 years of school and 4 years of college) by the age of 22, a large number of students take a break either before starting college or take longer to complete the 4-year college degree. Since decisions regarding choice of career and a commensurate education level are formed early in life, I exclude people younger than 25 years from the analysis. The assumption is that most people would have attained their desired level of education, especially a 4-year college degree, by that age. Hence, only individuals from ages 25-64 years of age are considered.

Table (1) summarizes the number of persons in each cohort grouped by quinquennial of birth separately for gender and whether they were

born in the United States. The smaller number of people in the later birth cohorts such as 1990 is because only people from the latest ACS years populated this group, whereas earlier cohorts - say 1965 - are populated by people from censuses 1990 and after. There are on average slightly more females than males in all cohorts except 1980-1990 among US-born people. Among the foreign-borns, there are more females up to cohort 1955 after which there are more foreign-born males residing in the US. The fraction of foreign-borns to US-borns for males and females varies between 5% in 1915 to about as high as 29% in 1970. Table (2) summarizes the education levels in terms of years of schooling, fraction of subgroup that completed high school, and fraction of subgroup that completed 4-year college. US-born women have slightly higher levels of total years of schooling and high-school completion rates compared to their male counterparts, when pooling all birth cohorts. However, the fraction of those who completed college is slightly higher among males. For those not born in the United States, men have higher education in terms of all metrics.

Figure (2) looks at years of schooling for subgroups belonging to the countries-of-origin used later by gender. Indian and Iranian males and females are amongst the highest educated groups in the US. Mexicans, Africans-Americans and Cubans are groups with the lowest levels of years of schooling. The patterns remain more or less the same when looking at US-born and foreign-born people from the same countries-of-origins. However, there is more variation amongst the foreign-borns (first-generation immigrants) relative to the US-borns (second-generation immigrants), as evident from figure (3).

4.2 Method

Decisions regarding one's education level, the field of study and broad career choices are made while growing up. One could imagine that expectations about the education of a potential partner and the corresponding choice about one's own education are shaped in these formative years through older role-model couples. If younger women only see older couples that conform to the norm of hypergamy and where men have a high-school degree (and women have the same or less), then they will not aspire for a college degree if they care about a happy married life more than earnings as a single woman. Conversely, if younger women see older couples that conform to hypergamy and where a significant proportion of men have higher education, they will include a

college degree in their aspirations without having to worry about the tradeoff between a happy married life and earnings as a single woman. Even though many people may meet their eventual partners while in college, the preference for a preferred partner is already been made before in most cases. It is also true that society prefers that women marry older men.

Hence, the effect of interest on women's education is the impact of changes in men's education 10-20 years older in age than them. To find the effect of men's education in the last period on the educational attainment of women in the current period, the primary equation of interest is:

$$S_t^g = \beta_0^M + (\beta_0^F - \beta_0^M)F + \beta_1^M S_{t-1}^M + (\beta_1^F - \beta_1^M)S_{t-1}^M * F + \gamma_t + \varepsilon_t^g \quad (6)$$

where S_t^g is the education level for gender g in cohort t, F is the dummy for female, and γ_t is the time fixed effect. $\beta_1^F - \beta_1^M$, the differential effect on females relative to males, is the coefficient of interest.

It is possible that there are different time trends for men and women due to the feminist movement, the introduction of the pill, or changes in labor market laws against gender discrimination, and their possible correlation with $S_{t-1}^M * F$. The 1965 Immigration Act helps us to instrument for S_{t-1}^M in (6). The "first-stage" equations are:

$$\begin{aligned} S_{t-1}^M &= \delta_0 + \delta_1 ACT_t + \delta_2 F + \gamma_t + v_t \\ S_{t-1}^M F &= \theta_0 + \theta_1 ACT_t F + \theta_1 F + \gamma_t + u_t \end{aligned}$$

where ACT is a dummy variable for whether or not the Act has passed yet. The IV assumption is that ACT_t is uncorrelated with ε_t^g. Thus, if there is an omitted trend that picks up the feminist movement, the ACT is a sudden shock that should be uncorrelated with it. Plugging the first-stage equations in the equation of primary interest, we obtain:

$$S_t^g = c + \beta_0' F + \beta_1^M \delta_1 ACT_t + (\beta_1^F - \beta_1^M)\theta_1 ACT_t F + \gamma_t' + \eta_t^g$$

where

$$
\begin{aligned}
c &= \beta_0^M + \beta_1^M \delta_0 + (\beta_1^F - \beta_1^M)\theta_0 \\
\beta_0' &= (\beta_0^F - \beta_0^M) + \beta_1^M \delta_2 + (\beta_1^F - \beta_1^M)\theta_2 \text{ and} \\
\gamma_t' &= \gamma_t + \beta_1^M \gamma_t + (\beta_1^F - \beta_1^M)\gamma_t
\end{aligned}
$$

We can't separately identify ACT_t and γ_t'. So, we can rewrite this as:

$$
S_t^g = c + (\beta_0^F - \beta_0^M)F + (\beta_1^F - \beta_1^M)\theta_1 ACT_t F + \gamma_t'' + \eta_t^g \qquad (7)
$$

This is similar to a differences-in-differences identification strategy to estimate the impact of a change in men's education pool on women's education, controlling for the relevant covariates and fixed effects. The outcome and treatment variables are measured in terms of years of schooling and rates of graduation in the population subgroup. Subgroups are defined by birth cohort, gender, and country-of-origin to exploit the variation in gender norms and levels of education. The difference-in-difference coefficient of interest is now $(\beta_1^F - \beta_1^M)\theta_1$. In the next section, I will take equation (7) to the data to see if there is an evidence for differential trends for women before and after the implementation of the Act.

The second method looks at the correlation between older generations' schooling and younger generations' schooling for combinations of older and younger men and women for different levels of school attainment. Since marital norms vary by ethnicity/country-of-origin, and the rate of marriage within one's own race and ethnicity is still high in the US, one could use this variation in norms and schooling levels by ethnicity to get more precise results. In this model, we control for country of origin-specific time trends to remove potential omitted variable bias and obtain more precise coefficients. We estimate everything as country of origin-specific except the effect of interest $(\beta_1^F - \beta_1^M)$.

Suppose, for simplicity, that there are two countries of origin, $R \in \{W, B\}$. The resulting equation of interest is:

$$
\begin{aligned}
S_t^{gR} = {} & \beta_0^{MW} + (\beta_0^{FW} - \beta_0^{MW})F + (\beta_0^{MB} - \beta_0^{MW})B \\
& + (\beta_0^{FB} - \beta_0^{FW} + \beta_0^{MW} - \beta_0^{MB})FB + \beta_1^M S_{t-1}^{MR} \\
& + (\beta_1^F - \beta_1^M)S_{t-1}^{MR}F + \gamma_t + \gamma_t B + \varepsilon_t^g \qquad (8)
\end{aligned}
$$

where R is for country-of-origin and FB is the interaction of female and country B. [7] I discuss the results of the above regressions in the following section.

4.3 Results

Figures (4) and (5) plot the predicted level of schooling from equation (7) for men and women born in the US in the decades before and after the 1965 Act. Instead of using one dummy for ACT_t before and after 1965, I use a full set of year dummies so as to capture the year-by-year trend in schooling level instead of a forced slope. The x-axis plots year-of-birth cohorts. The vertical lines at years 1945 and 1970 denote the cohort that was already 25 and the cohort that was just born respectively when the Act was implemented in 1970. The treatment group consists of people born after 1970. The group born before 1945 (who were already 25 or more years old when the Act was implemented) is treated as the control group.

As evident from the graph (4a), years of schooling increase for US-born women relative to that of US-born men after 1970. Schooling levels for US-born men and women followed almost parallel trends before 1945 with women's schooling always about half a year less than that for men. Not only do women close the gap after 1945, the trend reverses between 1945 and 1970. After 1970, there is a decline in the years of schooling for both men and women, though the decline is less severe for women.

The figure that is of more interest is (4b) which plots the same effect but for college completion rates among US-born men and women. If there is a differential effect of the norm of marrying-up on women compared to men, we expect it to be more pronounced for higher education levels. Figure (4b) shows similar trends in college-completion rates as in years of schooling, with women lagging behind men before 1945. There is a similar catching up and reversal of the gap between 1945 and 1970, for cohorts that were old enough to not be impacted by the change in the pool of highly skilled men after 1970 versus for cohorts that were potentially impacted. There is no decline in college-completion rates after 1970, in fact women's college completion rates

[7] Ongoing work focuses on constructing an instrument using the predicted S_{t-1}^{MR} based on Bartik's shift-share approach.

keep rising after 1970[8]. The effect on high-school completion rates (figure (5)) is similar with almost parallel trends for the cohort born before 1945 (already 25 years of age by 1970) and a divergence after 1945. However, the difference in trends and the subsequent reversal is more stark for college-graduation rates, as would be expected from the theory[9].

Table (3) provides the results of the direct regression of younger cohorts' education on older cohorts' (10 years senior) with the appropriate fixed effects. Each cell reports the results from a different regression. The independent variable always includes only US-born persons' schooling levels. The first column under M reports the regressions as in equation (8), with men's schooling levels on the right hand side separately and interacted with the female dummy. The first row reports the results for when we include both US-born and foreign-born men's schooling in the independent variable in the respective country-of-origin and birth cohort cells. The second row duplicates the same regression excluding foreign-born men's schooling from the independent variable, as reported under $M^U S$ column. The education variable reported in the top half of the table is the fraction of those with 16 or more years of reported schooling in the respective gender-cohort-country of origin bin. The education variable in the bottom half of the table reports the same results for the education variable of total years of schooling for the same population subgroups. All the regressions in the table include country of origin-specific time trends and controls for gender and country of origin interactions.

The coefficients $(\beta_1^F - \beta_1^M)$ reported in the first column (under M) of the table can be interpreted as the correlation between men's education with that of 10-years younger women in addition to their correlation with 10-years younger men's education. A positive and significant correlation coefficient of 0.6391 implies that a 1% increase in the fraction of all men who completed a 4-year college degree is associated with a 0.64% increase in the fraction of 10-years younger native women's education relative to 10-years younger native men. Similarly, a coefficient of 0.55 implies that a 1% increase in the fraction of native

[8]Figure (6) plots the same effect for years of school as figure (4) for birth cohorts sorted in 10 year bins for smoother trend lines

[9]The effects on years od schooling are statistically significant for years 1980 and 1990 at the 10% level. The effects on high-school completion rates are significant at the 5% level after 1960. The effects for graduation rates are significant at the 5% level after 1960.

men who completed a college degree is associated with a .5% increase in the fraction of 10-years younger native women who completed college relative to younger native men. The higher correlation coefficient for older men's education when including foreign-born men's schooling could be a result of a positive endogenous effect of immigration selection and market competition. A higher demand for skilled labor could result in more skilled immigrants moving to the United States to fill the deficit. The resultant higher competition from skilled immigrants could lead to native men responding by increasing their own educational attainment.

It is possible that the positive correlation between older men and younger women's college rates is simply a result of a role-model type effect, i.e., higher educational attainment among both men and women influence younger women more than younger men. While the role-model effect of older men and women on younger women should be present for all levels of schooling, the marrying-up effect on women should lead to a bigger effect of older men's higher education relative to older women's, and should be more pronounced at higher levels of education. The second column in table (3) reports the results of the same regression, replacing the independent variable of older men's education with that of older women's. The top half of the table reports the results for the fraction of college completion rates. We see that older women also have a significant and positive association with 10-years younger native women (0.5% when including non-native women, .46% when only including native women), but it is smaller than the association with older men.

The same regressions are replicated for the educational attainment variable of total years of schooling in the bottom half of the table. The left column reports the results when the independent variable includes men's education, the right columns reports them for the independent variable of older women's education. As expected, older men's correlation with younger women's is smaller compared to older women's when it comes to total years of schooling, whether we include foreign-borns or not. A one-year increase in women's schooling is associated with a 0.45 year increase in 10-years younger native women in addition to the impact on 10-years younger native men. The same association for older men is 0.28 years in additional years of school for 10-years younger native women. The size of the coefficients is smaller when looking at only native men and women's education's association with

those in younger generation. But older women's education seems to be more strongly correlated with that of younger women compared to older men's association with younger women for total years of schooling.

Table (4) reports the coefficients for the same regression in equation (8) for the education variable specified as the fraction of those with 12 or more years of reported schooling in the respective gender-cohort-country of origin bin. The correlation between older men's education with younger women's is less strong relative to the relationship for college completion rates or even total years of schooling. Hence it is clear that the positive association between older men and younger women's education is driven by higher (college) education. Table (5) lists the results from the same regression but for 20-years older cohorts' education as the independent variable. The pattern of correlations remains the same, with the highest correlation between older men and younger women for college graduation rate.

It is possible that the older cohorts' education terms on the left hand side of equation (8) contain or are influenced by the education choices of the generations older than them. Tables (6) and (7) report the same regressions adding additional lagged schooling terms along with the interaction terms. Doing so makes the association between older men and younger women's stronger for the oldest included generation. For women, the opposite is true for college graduation rates - the association of younger women's education with 20 years older women is smaller and weaker. The pattern of results are more mixed for years of school.

5 Conclusion

Closing gender disparities in education and employment have become a critical policy priority for policymakers (OECD, 2012). Substantial progress has been made on several key indicators such as college enrollment, the wage gap, the math-gender gap, etc. (Goldin et al., 2006). However, important barriers to gender equality still exist, more so in developing economies (Duflo, 2012), but not entirely absent in the economically advanced ones (Goldin, 2014).

In this paper, I study the effect of a change in the distribution of skills as measured by years of schooling on the education choices of

women. The results suggest that an increase in the number of high-skill individuals in the economy increases women's education relative to that of men. The same effect is evident when changing the control group to immigrant women in the US. In doing so, I hope to add to the empirical literature on the social aspect of education choice.

Lastly, the results presented in this paper should not be considered causal. There are several competing theories other than hypergamy that may give rise to the same results. However, even these results are interesting in themselves and worthy of further exploration.

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APPENDIX

A Country of Origin

Countries of origin were selected from the biggest immigrant groups in the last 10 decades as reported by the Migration Policy Institute and Pew Research Centers (Center, 2015; MPI, 2015). Based to these reports, I shortlisted 20 countries which exported the most immigrants to the United States between the period 1900 - 2016: Chinese, Indian, Vietnamese, Filipino, Korean, Iranian, Mexican, Cuban, Salvadoran, Dominican, Guatemalan, Russian, English, Irish, Italian, Austrian, Hungarian, Polish, German, Canadian.

Blacks are the biggest racial minority with distinctive patterns in demographics, education and marriage practices. While immigration from individual African countries has been low, when combined together it is a substantial number. Hence, I add the category *Black* to the above list by observing race and country of origin codes in the IPUMS data.

Broadly, these countries of origin capture the waves of immigration from Europe and Canada in the early twentieth century, the Central Americas during the mid-twentieth century, and from Asia and Africa in the later half of the twentieth century.

For the estimations which compare schooling levels of US-born and foreign-born agents from the above countries, I remove Salvadorean, Dominican and Guatemalan since there are no reported foreign-born agents in the age group 25-64 years for these countries in the data.

Hence, for the final count, I have 21 countries of origin for the reduced form regressions where I focus on only US-born agents. For the regressions where I use the variation between US born versus foreign-born agents, I drop the three nationalities - Salvadorean, Dominican, and Guatemalan - bringing the list of countries-of-origin down to 18.

1. Chinese
2. Indian
3. Vietnamese
4. Filipino
5. Korean

6. Iranian
7. Mexican
8. Cuban
9. Russian
10. English
11. Irish
12. Italian
13. Austrian
14. Hungarian
15. Polish
16. German
17. Canadian
18. Black

B Tables and Figures

B.1 Additional Robustness Check

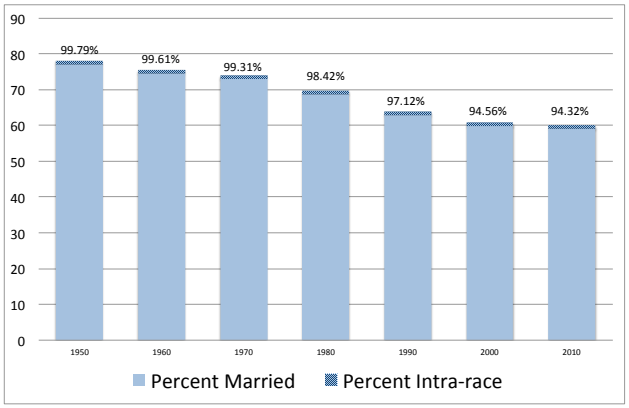
While the difference-in-difference results are encouraging, one could argue that the difference in schooling trends between men and women could potentially be a result of several factors other than marriage norms. For example, labor discrimination laws changed around the same period and we could be picking up the effect of those changes for women relative to men in the above graphs. Therefore, we need a control group in the same gender. In this section, I use foreign-born women in the same birth cohorts residing in the US as another control group for a robustness check. There is complete information on all the relevant statistics for this demographic group as well in the Census and ACS data. The gender-specific labor market trends for US-born women will be more similar to immigrant women than to US-born men.

I expect that US-born women will respond more to a change in the distribution of schooling for men in the US than immigrant women. I make the assumption that immigrant women have better access to their home country marriage markets than US-born women from the same nationalities or ethnicities. For example, high-skilled workers who move to the US for work are more likely to look for a partner in their home countries than people born in the US. First-generation immigrants are more likely to marry other first-generation immigrants from the same ethnicities than second-generation or higher immigrants within their communities. Second-generation or higher immigrants, or people born in the US, are unlikely to go back to their country of origin to find a suitable mate because of differences in lifestyles, upbringing, societal expectations, etc. Hence, immigrant women are more likely to be affected by marriage market shifts in their country of origin than in the US. There are also women who emigrate after marriage, who will not be affected by changes in the US marriage market at all, assuming they do not consider marrying again or have completed their education investments.

Figure (7) plots the schooling level for women born in the US versus those born who immigrated to the US between 1915 and 1990. The x-axis is the year of birth cohort.

It is possible that this result is driven by the change in the selec-

Figure 1: Endogamy in the U.S.



(a) Rates of Marriage and Endogamy in the U.S., 1950-2010. The endogamy or intra-race marriage rate is a fraction of those married.

Married couples in the United States in 2010				
	White Wife	Black Wife	Asian Wife	Other Wife
White Husband	**97.70%**	0.30%	1.00%	0.90%
Black Husband	8.60%	**89.20%**	0.90%	1.30%
Asian Husband	7.00%	0.30%	**91.80%**	0.90%
Other Husband	44.00%	1.60%	3.40%	51.00%

Source: U.S. Census Bureau

(b) Breakdown of couples' ethnicity in the US, 2010. The rows sum up to unity.

Table 1: Summary Statistics: Number of persons in each cohort

	US-Born		Foreign-Born	
	Male	Female	Male	Female
1915	210	226	9.85	11.25
1920	223	239	12	14
1925	211	226	12	16
1930	198	210	13	16
1935	244	260	24	30
1940	564	602	64	76
1945	988	1,050	133	151
1950	1,490	1,570	225	242
1955	1,630	1,710	290	300
1960	1,660	1,720	350	345
1965	1,410	1,450	372	363
1970	1,330	1,360	391	378
1975	1,130	1,140	333	313
1980	853	850	215	200
1985	450	443	99	93
1990	61	59	11	10

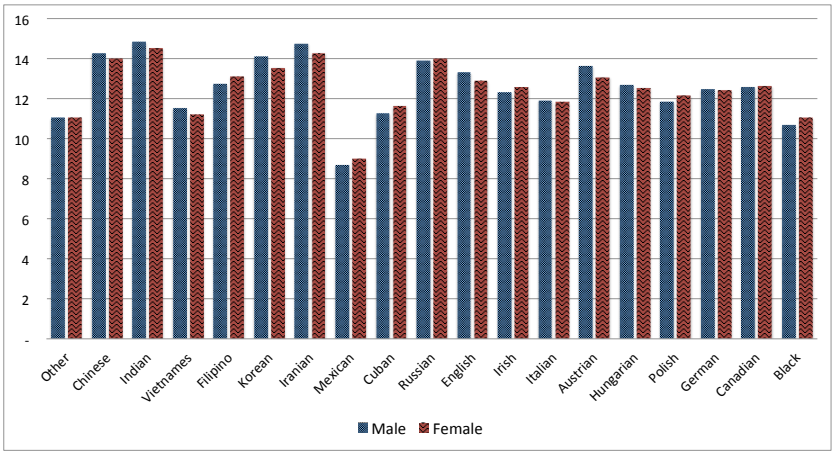
All numbers in units of 100,000. Data includes persons 25-64 year old pooled by birth cohort from Census and ACS samples between 1940 - 2016. Birth cohorts here are 5-year groups, for example, 1980 includes persons born between 1980-1984, 1985 includes persons born between 1985-1989. M and F denote males and females respectively.

Table 2: Summary Statistics: Schooling Statistics by Gender and Birthplace

	Male	Female
	US-Born	
Years of School	12.29	12.36
High School	0.76	0.78
4-year College	0.34	0.33
	Foreign-born	
Years of School	12.02	11.46
High School	0.72	0.70
4-year College	0.37	0.31
	All	
Years of School	12.16	11.91
High School	0.74	0.74
4-year College	0.36	0.32

Data includes persons 25-64 year old pooled by birth cohort from Census and ACS samples between 1940 - 2016. High School and 4-year College denote fraction of individuals who completed 12 years and 16+ years of schooling respectively.

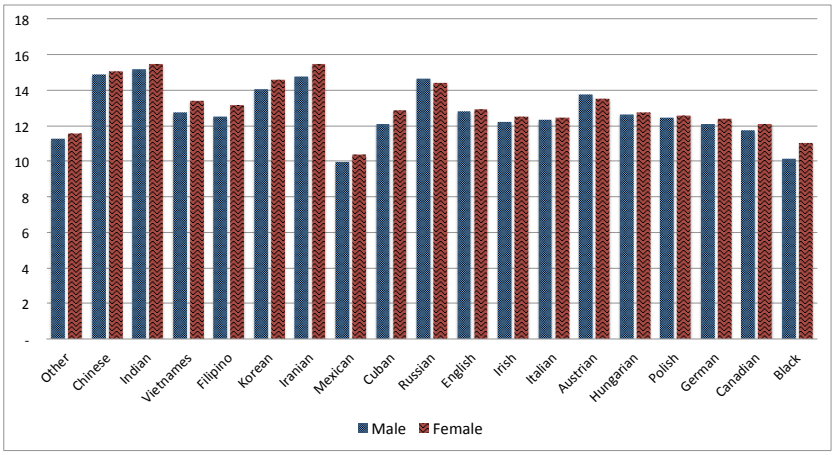
Figure 2: Summary Statistics: Years of School by Country of Origin and Gender



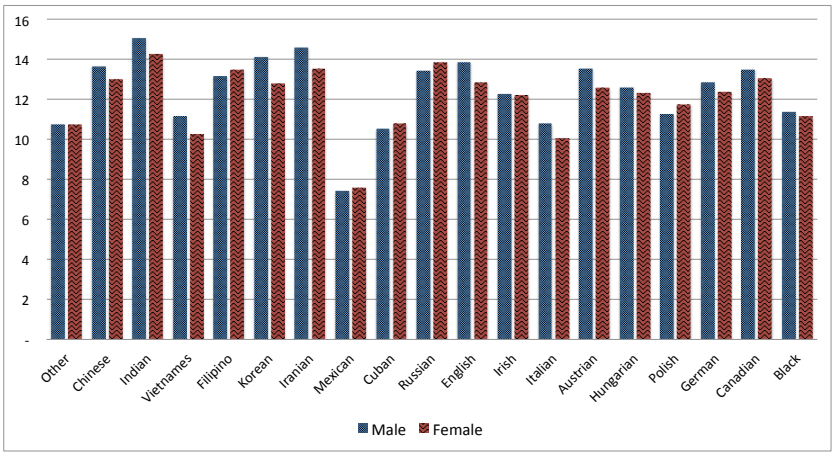
(a) Average years of schooling for all men and women aged 25-64 by country of origin.

These figures plot years of school for the population of all persons residing in the US, including both US-born (second generation) and foreign-born (first-generation) men and women aged 25-64 years.

Figure 3: Summary Statistics: Years of School by Country of Origin, Birthplace and Gender



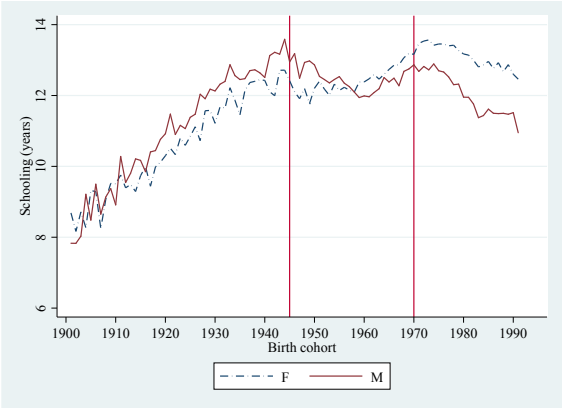
(a) Average years of schooling for U.S.-born men and women aged 25-64 by country of origin.



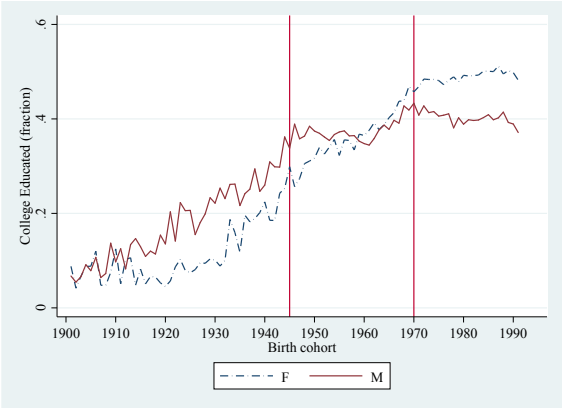
(b) Average years of schooling for Foreign-born men and women aged 25-64 by country of origin.

These figures plot years of school for the population of US-born (second generation) and foreign-born (first-generation) men and women aged 25-64 years.

Figure 4: Trends in Schooling - US Born Men versus Women (Birth Cohorts 1910-1990 by Year)



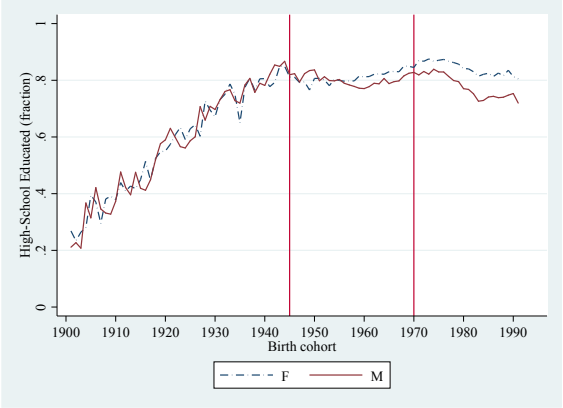
(a) Average years of schooling for U.S. born men (M) and women (F) aged 25-64 by year of birth.



(b) Fraction of people with 4 years of college among US born men (M) and women (F) aged 25-64 by year of birth.

These figures plot schooling levels for the population of US-born men and women aged 25-64 years. An observation is a gender x country of origin x year of birth bin. The country of origin is coded using Appendix Section A categories. The x-axis plots the year of birth. The vertical lines at year 1945 and year 1970 denote the cohorts who were age 25 and age 0 (just born) respectively at the time of implementation of the Immigration Act in 1970. Individual-level data from Census and ACS years 1940-2016 are pooled to create the year of birth bins.

Figure 5: Trends in Schooling - US Born Men versus Women (Birth Cohorts 1910-1990 by Decade)



(a) Fraction of people with 12+ years of schooling among US born men (M) and women (F) aged 25-64 by decade of birth.

This figure plots high-school completion rate for the population of US-born men and women aged 25-64 years. An observation is a gender x country of origin x decade of birth bin. The country of origin is coded using Appendix Section A categories. The x-axis plots the decade of birth. The vertical lines at year 1945 and year 1970 denote the cohorts who were age 25 and age 0 (just born) respectively at the time of implementation of the Immigration Act in 1970. Individual-level data from Census and ACS years 1940-2016 are pooled to create the year of birth bins. In the above graphs, years of birth are grouped by decade for smoother trend lines.

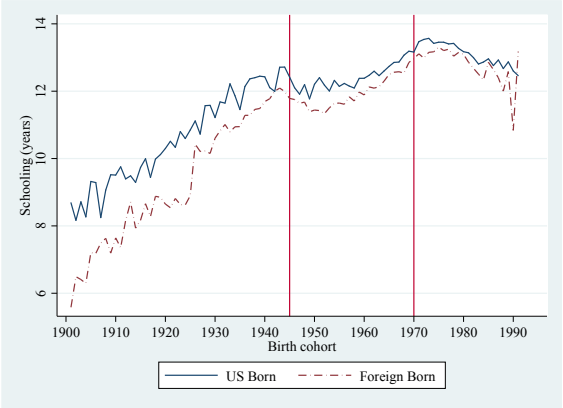
Figure 6: Trends in Schooling - US Born Men versus Women (Birth Cohorts 1910-1990 by Decade)

(a) Average years of schooling for U.S. born men (M) and women (F) aged 25-64 by decade of birth.

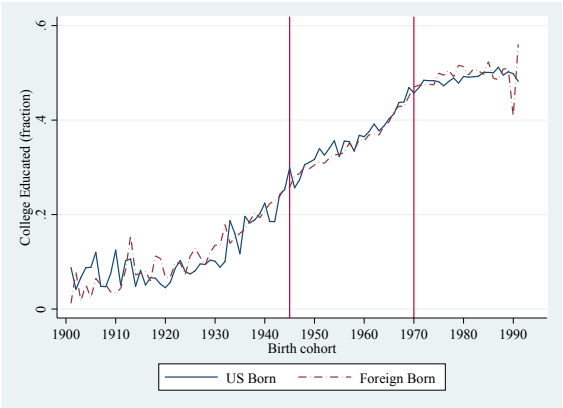
(b) Fraction of people with 4 years of college among US born men (M) and women (F) aged 25-64 by decade of birth.

These figures plot schooling levels for the population of US-born men and women aged 25-64 years. An observation is a gender x country of origin x decade of birth bin. The country of origin is coded using Appendix Section A categories. The x-axis plots the decade of birth. The vertical lines at year 1945 and year 1970 denote the cohorts who were age 25 and age 0 (just born) respectively at the time of implementation of the Immigration Act in 1970. Individual-level data from Census and ACS years 1940-2016 are pooled to create the year of birth bins. In the above graphs, years of birth are grouped by decade for smoother trend lines.

Figure 7: Trends in Schooling - Women US-born versus Foreign-born (Birth Cohorts 1910-1990 by Year)



(a) Average years of schooling for U.S.-born and Foreign-born women aged 25-64 by year of birth.



(b) Fraction of people with 4 years of college among U.S.-born and Foreign-born women aged 25-64 by year of birth.

These figures plot schooling levels for the population of US-born (second generation) and foreign-born (first-generation) women aged 25-64 years. An observation is a gender x country of origin x year of birth bin. The country of origin is coded using Appendix Section A categories. The x-axis plots the year of birth. The vertical lines at year 1945 and year 1970 denote the cohorts who were age 25 and age 0 (just born) respectively at the time of implementation of the Immigration Act in 1970. Individual-level data from Census and ACS years 1940-2016 are pooled to create the year of birth bins.

Table 3: Correlation between older and younger cohorts' education

Differential Impact on US-Born Younger Women versus Men - 10 years older cohort

	S_t = Fraction College	
$\beta^F - \beta^M$	M	F
S_{t-10}	0.6391***	0.5053***
	(0.055)	(0.036)
FE: Country-of-origin x Birth-cohort	✔	✔
	M^{US}	F^{US}
S_{t-10}	0.5507***	0.4589***
	(0.069)	(0.036)
FE: Country-of-origin x Birth-cohort	✔	✔
	S_t = Years of School	
	M	F
S_{t-10}	0.2808***	0.4472***
	(0.047)	(0.039)
FE: Country-of-origin x Birth-cohort	✔	✔
$\beta^F - \beta^M$	M^{US}	F^{US}
S_{t-10}	0.1976***	0.3952***
	(0.061)	(0.047)
FE: Country-of-origin x Birth-cohort	✔	✔

Each cell is a different regression. Data includes persons 25-64 year old pooled by birth cohort. Birth cohorts here are 5-year groups, for example, persons born between 1980-1985. Fraction College is the fraction of individuals with 16+ years of schooling. M and F denote the independent variable of schooling of older males and older females respectively and includes both US-born and foreign-born persons. The superscript US in M^{US} and F^{US} implies that the independent variable takes into account only US born persons in the older cohorts. The dependent variable includes US-born persons only. ***significant at the 0.01% level. ** significant at the 5% level. * significant at the 10% level.

Table 4: Correlation between older and younger cohorts' education

Differential Impact on US-Born Younger Women versus Men - 10 years older cohort		
	S_t = Fraction High School	
$\beta^F - \beta^M$	M	F
S_{t-10}	0.1278***	0.1702***
	(0.036)	(0.042)
FE: Country-of-origin x Birth-cohort	✔	✔
	M^{US}	F^{US}
S_{t-10}	0.1204**	0.1266***
	(0.050)	(0.034)
FE: Country-of-origin x Birth-cohort	✔	✔

Each cell is a different regression. Data includes persons 25-64 year old pooled by birth cohort. Birth cohorts here are 5-year groups, for example, persons born between 1980-1985. Fraction High School is the fraction of individuals with 12+ years of schooling. M and F denote the independent variable of schooling of older males and older females respectively and includes both US-born and foreign-born persons. The superscript US in M^{US} and F^{US} implies that the independent variable takes into account only US born persons in the older cohorts. The dependent variable includes US-born persons only. ***significant at the 0.01% level. ** significant at the 5% level. * significant at the 10% level.

Table 5: Correlation between older and younger cohorts' education

Differential Impact on US-Born Younger Women versus Men - 20 years older cohort

	S_t = Fraction College	
$\beta^F - \beta^M$	M	F
S_{t-20}	0.5869***	0.4679***
	(0.049)	(0.036)
FE: Country-of-origin x Birth-cohort	✔	✔
	M^{US}	F^{US}
S_{t-20}	0.4967***	0.4266***
	(0.049)	(0.032)
FE: Country-of-origin x Birth-cohort	✔	✔
	S_t = Fraction High School	
	M	F
S_{t-20}	0.1722***	0.1806***
	(0.025)	(0.020)
FE: Country-of-origin x Birth-cohort	✔	✔
	M^{US}	F^{US}
S_{t-20}	0.1533**	0.1650***
	(0.026)	(0.026)
FE: Country-of-origin x Birth-cohort	✔	✔
	S_t = Years of School	
	M	F
S_{t-20}	0.3699***	0.4324***
	(0.039)	(0.035)
FE: Country-of-origin x Birth-cohort	✔	✔
	M^{US}	F^{US}
S_{t-20}	0.3086***	0.3797***
	(0.039)	(0.036)
FE: Country-of-origin x Birth-cohort	✔	✔

Each cell is a different regression. Data includes persons 25-64 year old pooled by birth cohort. Birth cohorts here are 5-year groups, for example, persons born between 1980-1985. Fraction College is the fraction of individuals with 16+ years of schooling. Fraction High School is the fraction of individuals with 12+ years of schooling. M and F denote the independent variable of schooling of older males and older females respectively and includes both US-born and foreign-born persons. The superscript US in M^{US} and F^{US} implies that the independent variable takes into account only US born persons in the older cohorts. The dependent variable includes US-born persons only. ***significant at the 0.01% level. ** significant at the 5% level. * significant at the 10% level.

Table 6: Correlation between older and younger cohorts' education

Differential Impact on younger women - 10 and 20 years older cohorts		
	S_t = Fraction College	
$\beta^F - \beta^M$	M	F
S_{t-10}	.2099**	.3053***
	(.099)	(.090)
S_{t-20}	.4633***	.1888**
	(.077)	(.084)
FE: Country-of-origin x Birth-cohort	✔	✔
	M^{US}	F^{US}
S_{t-10}	.1412*	.1677**
	(.083)	(.083)
S_{t-20}	.4234***	.2805***
	(.069)	(.071)
FE: Country-of-origin x Birth-cohort	✔	✔
	S_t = Years of School	
	M	F
S_{t-10}	-.2154***	.1779**
	(0.088)	(.076)
S_{t-20}	.4349***	.3225***
	(.049)	(.055)
FE: Country-of-origin x Birth-cohort	✔	✔
	M^{US}	F^{US}
S_{t-10}	-.3330***	.2158***
	(.086)	(.072)
S_{t-20}	.4119***	.2609***
	(.047)	(.049)
FE: Country-of-origin x Birth-cohort	✔	✔

Each cell is a different regression. Data includes persons 25-64 year old pooled by birth cohort. Birth cohorts here are 5-year groups, for example, persons born between 1980-1985. Fraction College is the fraction of individuals with 16+ years of schooling. M and F denote the independent variable of schooling of older males and older females respectively and includes both US-born and foreign-born persons. The superscript US in M^{US} and F^{US} implies that the independent variable takes into account only US born persons in the older cohorts. The dependent variable includes US-born persons only. ***significant at the 0.01% level. ** significant at the 5% level. * significant at the 10% level.

Table 7: Correlation between older and younger cohorts' education

Differential Impact on younger women - 10, 20, and 30 years older cohort		
	S_t = Fraction College	
$\beta^F - \beta^M$	M	F
S_{t-10}	.2721***	.3315***
	(.080)	(0.102)
S_{t-20}	.2337***	.1271
	(0.078)	(0.080)
S_{t-30}	.3282***	.0702
	(.045)	(0.092)
FE: Country-of-origin x Birth-cohort	✔	✔
	M^{US}	F^{US}
S_{t-10}	.1812***	.1942***
	(0.066)	(0.073)
S_{t-20}	.2036***	.1550**
	(.051)	(0.067)
S_{t-30}	.3015***	.1390**
	(.041)	(0.063)
FE: Country-of-origin x Birth-cohort	✔	
	S_t = Years of School	
	M	F
S_{t-10}	.1262	.3500***
	(.118)	(.081)
S_{t-20}	.1512*	.1533*
	(.088)	(.084)
S_{t-30}	.3627***	.2290***
	(.043)	(.045)
FE: Country-of-origin x Birth-cohort	✔	✔
	M^{US}	F^{US}
S_{t-10}	-.0530	.2979***
	(.103)	(.066)
S_{t-20}	.0676	.0835
	(.108)	(.092)
S_{t-30}	.3226***	.2971***
	(.051)	(.054)
FE: Country-of-origin x Birth-cohort	✔	✔

Each cell is a different regression. Data includes persons 25-64 year old pooled by birth cohort. Birth cohorts here are 5-year groups, for example, persons born between 1980-1985. Fraction College is the fraction of individuals with 16+ years of schooling. M and F denote the independent variable of schooling of older males and older females respectively and includes both US-born and foreign-born persons. The superscript US in M^{US} and F^{US} implies that the independent variable takes into account only US born persons in the older cohorts. The dependent variable includes US-born persons only. ***significant at the 0.01% level. ** significant at the 5% level. * significant at the 10% level.

Table 8: Correlation between older and younger cohorts' education

Differential Impact on younger women - 10 and 20 years older cohorts		
	S_t = Fraction High School	
$\beta^F - \beta^M$	M	F
S_{t-10}	-0.0713	-0.0279
	(0.098)	(.065)
S_{t-20}	.2028***	0.1967***
	(.036)	(.035)
FE: Country-of-origin x Birth-cohort	✔	✔
	M^{US}	F^{US}
S_{t-10}	-.0482	0.0343
	(.126)	(.053)
S_{t-20}	.1716***	0.1493***
	(.041)	(0.028)
FE: Country-of-origin x Birth-cohort	✔	✔

Each cell is a different regression. Data includes persons 25-64 year old pooled by birth cohort. Birth cohorts here are 5-year groups, for example, persons born between 1980-1985. Fraction High School is the fraction of individuals with 12+ years of schooling. M and F denote the independent variable of schooling of older males and older females respectively and includes both US-born and foreign-born persons. The superscript US in M^{US} and F^{US} implies that the independent variable takes into account only US born persons in the older cohorts. The dependent variable includes US-born persons only. ***significant at the 0.01% level. ** significant at the 5% level. * significant at the 10% level.

Table 9: Correlation between older and younger cohorts' education

Differential Impact on younger women - 10, 20, and 30 years older cohort		
	S_t = Fraction High School	
$\beta^F - \beta^M$	M	F
S_{t-10}	.0844	0.1203*
	(.082)	(0.065)
S_{t-20}	.0645	0.0634
	(.055)	(0.046)
S_{t-30}	.1587***	0.1344***
	(.027)	(0.02)
FE: Country-of-origin x Birth-cohort	✔	✔
	M^{US}	F^{US}
S_{t-10}	-.0508	0.0452
	(.077)	(0.056)
S_{t-20}	.0484	.0433
	(.047)	(.051)
S_{t-30}	.1529***	0.1564***
	(.026)	(.0256)
FE: Country-of-origin x Birth-cohort	✔	✔

Each cell is a different regression. Data includes persons 25-64 year old pooled by birth cohort. Birth cohorts here are 5-year groups, for example, persons born between 1980-1985. Fraction High School is the fraction of individuals with 12+ years of schooling. M and F denote the independent variable of schooling of older males and older females respectively and includes both US-born and foreign-born persons. The superscript US in M^{US} and F^{US} implies that the independent variable takes into account only US born persons in the older cohorts. The dependent variable includes US-born persons only. ***significant at the 0.01% level. ** significant at the 5% level. * significant at the 10% level.

tion of women who immigrate to the US after 1965 by educational background. I propose to distinguish effects on women who immigrate early in their formative years, say before 6 years of age when children typically start school, and those who immigrate after they are 40 years of age when most marital and educational decisions have been made. The advantage of this approach would be that older (40+ years) women who immigrated after they were 40, before and after 1965, will give us a more clean control group which would not be affected by US marriage market shifts at all, while younger immigrant women who have been raised in the US are more likely to be affected by social changes in the US marriage market.