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ABSTRACT

Using national survey data and measures of housing prices, we examine the effects of demographic and socioeconomic determinants of entry into marriage in urban China spanning the past six decades. Our study yields three significant findings. First, the importance of economic prospects has significantly increased during the economic reform era. Second, the positive effect of working in the state-owned sector has substantially weakened. Third, for the most recent period after the housing reform in urban China, the effects of education vary with local housing prices. Specifically, a higher level of education is associated with early entry into marriage when housing prices are relatively high but with late entry into marriage when housing prices are relatively low. Taken together, these results suggest that the determinants of marriage in China should be understood within a broader context of institutional changes.

1. INTRODUCTION

Numerous studies have documented the importance of marriage timing to a variety of social outcomes such as fertility, education, and women's employment in both developed and developing countries (e.g., Casterline 1994; Coale and Treadway 1986; Rosero-Bixby 1996). Along with family structure, gender relations, and other aspects of the family, marriage timing has also served as a marker of social change (Nobles and Bутtenheim 2008; Raymo 2003; Yabiku 2004). In most societies, the trend has been in the direction of later marriages, i.e., delays in marriage timing (Lesthaeghe and Surkyn 1988; Lesthaeghe and Moors 2000). Several explanations have been proposed for the general trend of delays in marriage timing, the most prominent of which are the decline in fertility, ideational changes, and increased labor force participation of women (Malhotra 1997; Blossfeld and Huinink 1991; Oppenheimer 1988).

China has been undergoing rapid and significant societal changes in recent decades, in large part precipitated by the economic reform that began in 1978 (Xie 2011). In this study, we situate our empirical work in urban China and examine both temporal and spatial variations in the individual-level determinants of marriage timing, paying close attention to institutional changes associated with the economic reform. We argue that institutional changes affect not only marriage timing overall but also how individual-level characteristics affect entry into marriage interactively.

In this paper, we study both temporal and spatial variations in patterns of entry to first marriage in urban China, capitalizing on recent data from the 2003 and 2008 Chinese General Social Surveys (CGSS). We ask how the emergence of a market economy and the rise of a consumer culture may have changed the way social determinants affect marriage entry. Our study consists of three parts. First, we provide an overall description of the changing patterns of first marriage in urban China. Second, we compare cohort differences in how individual-level demographic and socioeconomic determinants affect marriage entry. Finally, for the most recent marriage cohort, we explore the temporal-spatial variation in how the effects of individual-level determinants on marriage entry are moderated by local housing prices. For the third part, we link CGSS individual-level data to a prefecture-year specific housing prices measure extracted from the China Urban Construction Statistical Yearbook and the China Regional Economy Statistical Yearbook.

2. THEORETICAL ISSUES AND PREVIOUS STUDIES

A longstanding idea in the literature on marriage formation is gender role specialization (Parsons 1949). In recent decades, this idea has been formally represented by Gary Becker (1973, 1974, 1991) and other scholars in a "specialization and trading" model. This model maintains that the major gain to marriage lies in the mutual dependence of the spouses, arising out of their differentiated functions in the family, with the wife specializing in domestic labor and the husband in paid work. In addition, it is assumed that women and men anticipate this role specialization following marriage when looking for marriage partners and thus trade attributes for their respective specialized roles in order to gain maximally from marriage. Under this model, success in the labor market has very different implications for young men than for women anticipating marriage. For men, obtaining a good position in the labor market increases their desirability as marriage partners and thus their opportunities to get married. For women, however, more involvement in the labor market means less specialization in domestic work and thus reduced gains from marriage, leading to a higher likelihood of non-marriage or late marriage (Goldscheider and Waite 1986; Oppenheimer, Kalmijn, and Lim 1997; Preston and Richards 1975).

Oppenheimer (1988) provided an alternative "marriage-search" theory. While acknowledging that a woman's high economic status in the labor market makes her an attractive marriage partner in modern society, the theory argues that her economic resources also enable her to sustain a more thorough search for a desirable marriage partner, thus prolonging her time before getting married. Over time, however, Oppenheimer's theory predicts that women's economic characteristics are favorably evaluated in the marriage market by their potential marriage partners.

Evidence bearing on the relationship between women's economic characteristics and their entry into marriage, however, remains ambiguous. On the one hand, studies based on macro-level data have generally found a negative relationship between women's economic characteristics -- education and earnings, for instance -- and their marriage rates (Coughlin and Drewianka 2011; Cready, Fossett, and Kiecolt 1997; Lichter, leClere, and McLaughlin 1991; McLanahan and Casper 1995; Preston and Richards 1975; White 1981). On the other hand, scholars focusing on individual-level characteristics have shown not only that women's economic prospects are positively related to marriage (Cherlin 1980; Goldscheider and Waite

1986; Lichter, McLaughlin, and Ribar 2002; Oppenheimer and Lew 1995; Thornton, Axinn, and Xie 2007; Waite and Spitze 1981), but also that the importance of women's economic prospects for marriage has increased over time (Lichter, McLaughlin, and Ribar 2002; Goldstein and Kenney 2001; Qian and Preston 1993; Sweeney 2002). Moreover, a recent study of European countries reports that education, a major determinant of economic potential, exerts varying effects on marriage entry across different social contexts (Kalmijn 2013).

In contrast, past research has consistently found evidence for the positive role of men's economic prospects in marriage entry. Studies using either cross-sectional or longitudinal data have invariably observed a positive relationship between measures of men's economic prospects and marriage formation (e.g. Cooney and Hogan 1991; Goldscheider and Waite 1986; Goldstein and Kenney 2001; Lloyd and South 1996; MacDonald and Rindfuss 1981; Mare and Winship 1991; Oppenheimer, Kalmijn, and Lim 1997; Qian and Preston 1993; Sassler and Schoen 1999; Sweeney 2002; Teachman, Polonko, and Leigh 1987; Xie et al. 2003). The uniformity in this finding confirms the traditional model of marriage in which the husband is considered the breadwinner and the wife the homemaker.

American and other western societies have been relatively stable in the past 80 years. One notable social change is women's rapid increase in labor force participation and attachment (Goldin 2006; Spain and Bianchi 1996). As a result, past research on trends in marriage entry has largely focused on the changing role of women's economic characteristics, with the expectation that women's economic characteristics should converge over time in importance with men's economic characteristics in affecting marriage entry.

Post-reform China is very different, as many large-scale social changes have been co-evolving relatively fast in recent decades (Xie 2011). Post-reform China thus affords us a rare opportunity to consider how individual-level determinants of marriage may be moderated by macro-level institutional conditions. This study exploits this opportunity, capitalizing on recent Chinese data covering different marriage cohorts and across cities with varying housing prices. An explicit aim of the research is to discover, within the contemporary Chinese context, how broader institutional changes moderate the way in which individual-level determinants affect marriage formation (Gould and Paserman 2003; Kuo 2003; Lichter et al. 1992; Lichter, McLaughlin, and Ribar 2002).

3. POST-REFORM CHINA

Post-reform China provides a unique setting in which to advance our understanding about how personal economic characteristics affect marriage formation in different social contexts. Since its founding in 1949, the People's Republic of China has undergone several dramatic social changes, especially in terms of its economy. Governed by ideologically charged political elites, China's command economy stagnated from the 1950s to the 1970s. China began its economic reform in 1978 by introducing a market economy in rural areas. After 1992, the market reform was expanded to cover its urban economy.

Marriage as a social institution has also undergone dramatic changes in China during the same period. Traditional Chinese culture placed great importance on the family and encouraged all young persons to enter marriage as early as possible (Thornton and Lin 1994). In a regime influenced by this cultural tradition, individuals' characteristics had limited effects on marriage formation. However, due to marketization and the influence of western cultures accompanying the economic reform, the tradition of universal and early marriages has eroded.

Marketization in post-reform China has weakened the long-standing advantages held by workers in the state sector during the pre-reform era. Further, consumption practices and housing situations have also changed greatly in urban China. As discussed in the past literature (Bian 2002; Wu 2002; Xie, Lai, and Wu 2009), the ownership of a work unit (*danwei*) was historically strongly associated with one's economic welfare, especially during the Mao era. Working in the state-owned sector was commonly labeled as having "iron rice bowls" (*tie fanwan*), symbolizing advantages in many aspects of life, such as housing. As we discuss below, the economic reform has significantly reduced both the number of state-sector employees and the advantages they enjoy. As a result, the attractiveness of a state-sector job has declined. Such institutional changes in urban China provide us with the opportunity to examine how macro-level state policies and structural changes may alter the relevance of specific micro-level attributes in a marriage market.

Before the economic reform, consumption in China was highly regulated by the state to be egalitarian (Parish 1981, 1984). Urban residents' consumption was largely dependent on the distribution by bureaucrats (Walder 1986). Along with food and daily necessities, which

must be bought with rationing coupons issued by local governments, home appliances, bicycles, and other “luxury” goods were all subject to limited allocations. Such “redistributive” practices were changed by the reform (Tang and Parish 2000). As the average income has increased, urban China has experienced an ongoing consumer revolution (Davis 1992, 2000). Rises in consumerism have led younger generations of Chinese to form high and ever-rising expectations regarding living standards and to find new ways to realize these expectations. These changes in consumption patterns may have strengthened the role of economic factors in marriage formation in post-reform urban China.

Changes in housing may be particularly important in this context. In pre-reform China, basic, low-rent housing (costing 1% to 2% of household income) was available to virtually all urbanites. Work units were largely responsible for the construction and the distribution of these housing units before the housing reform in the mid-1990s (Bian et al. 1997; Logan and Bian 1993; Whyte and Parish 1984). The ownership and bureaucratic ranks of work units affected the size and the amenities of the housing units (Bian 1994; Walder 1986, 1992). However, this redistributive system had undesirable consequences (Tang and Parish 2000), such as the abuse of bureaucratic authority and discouragement of labor mobility. Between 1988 and 1998, a number of measures were taken by the Chinese government to reform housing so as to render it market-driven, thereby terminating a 50-year system in which housing was allocated as a job benefit (Wu 1996). This reform led to the emergence of China’s private housing market (so-called “commercial housing”). The share of private housing in the total annual supply more than doubled from about 13% in 1986 to about 33% in 1993, then grew continuously to 72% by 2006 (Wu, Gyourko, and Deng 2012). One direct consequence of the housing reform has been the skyrocketing of housing prices. In our sample, the average housing price increased from 315 RMB per square meter in 1991 to 2,628 RMB per square meter by 2008.¹ However, housing price increases have varied considerably across cities, with the fastest increases experienced in the extremely large cities. For example, in Beijing, the increase was from 602 to 12,418 RMB per square meter during

1 The housing prices in this paper are all inflated to 2008 price levels using the Consumer Price Index.

the same period. This represents an increase of 20 times. The disintegration of the state housing system and the subsequent soaring housing prices have exerted great economic pressures on urban residents in China. Several studies have linked the rise in housing prices to micro-level economic behaviors among urban residents, such as higher savings rates and entrepreneurship (Wei and Zhang 2011a, 2011b).

Owning a housing unit is often considered a necessity for marriage. High housing prices may thus have imposed intense pressure on young persons anticipating marriage in recent years. Conversely, those who can afford to own housing units may have become increasingly attractive as marital partners. In other words, good economic prospects should increase one's attractiveness as a marriage partner in post-reform China. However, the relevance of economic factors to marriage formation may not be uniform across contexts, because housing prices have increased unevenly in China. We expect that the importance of economic factors for marriage varies positively with local housing prices.

In studying changes in social determinants of marriage in post-reform urban China, our research also contributes to the empirical literature on the relationship between economic factors and marriage formation in general. In the past literature, scholars have mainly focused on western countries, such as the U.S., where social changes have been either gradual (for women) or unclear (for men). We know that China has undergone significant societal changes in its recent history, particularly the Great Leap, the Cultural Revolution, and the market transition, and thus such a setting may enable us to observe clearer patterns in the changing effects of economic status for both women and men. Moreover, institutional changes such as marketization and the housing reform could also give us an opportunity to observe how macro-level factors might alter the process of micro-level marital behaviors. In this study, we situate our empirical work in urban China and examine the role of economic factors in entry into marriage within the context of its rapid social changes.

Our study has two concrete aims. First, we will evaluate the trend in the importance of economic prospects in marriage formation for both men and women. Second, we will explore the causal mechanism behind the observed trend by revealing how a given macro-level factor-- local housing prices-- may mediate the relationship between an individual's economic status and his/her marriage formation.

4. DATA AND MEASURES

4.1. Data

For this study, we first use data from China's 2005 1% Population Inter-census Survey (also known as the 2005 mini-census) to describe changes in the general patterns of marriage timing in recent decades. To study changing roles in individual-level marriage determinants, we also analyze data from the 2003 and 2008 China General Social Surveys (CGSS2003 and CGSS2008). The Chinese General Social Survey is a repeated cross-sectional national survey of the adult population aged 18 or above. The 2003 CGSS only covered urban China, and the 2008 CGSS covered both rural and urban China (except for Tibet). The CGSS employs a multi-stage stratified random sampling method. First, primary sampling units were selected from county or county-level districts, stratified by region, rural or urban location, and economic development levels. Second, four second-level sampling units (at township or community level) were selected in each primary sampling unit. Third, two third-level sampling units (at neighborhood or village committee level) were selected in each selected second-level unit. Finally, ten households were selected in each third-level sampling unit. One eligible person aged 18 or above is randomly selected from each sampled household to serve as the survey respondent. Since the survey includes very detailed information on the education and work history of each respondent, we were able to construct annual measures from retrospective questions. In this study, we restrict our sample to the urban respondents.

4.2. Variables and Method

We use the discrete-time logit regression to model the effects of economic status on the hazard rate of entry into first marriage. This approach permits us to estimate the effects of both time-invariant and time-varying covariates on entry into marriage and avoids the assumption of proportional hazards (Allison 1995). The dependent variable in the analysis is a dichotomous indicator of whether a marriage occurred in the interval of a year, with time-varying independent variables fixed at the beginning of the interval. Data are organized into person-year records, with one record for each person-year interval in which a respondent was at risk for first marriage, including the interval in which the first marriage occurred. For this analysis, the risk for marriage is assumed to begin at age 15.

To study social changes, we compare the marital behavior of successive birth cohorts. As articulated by Ryder (1965), "if [social] change does occur, it differentiates cohorts from one another, and the comparison of their careers becomes a way to study change." Therefore, we compare three birth cohorts in this study: the pre-reform cohort (born before 1960), most of whom were exposed to marriage risk before the reform of China in 1978; the early-reform cohort (born between 1960 and 1974), most of whom were exposed to marriage risk during the early reform years (1978-1992) in China; the late-reform cohort (born after 1974), most of whom were exposed to marriage risk during the period of comprehensive urban reform after the South Tour Speech of Deng Xiaoping in 1992.

In addition to the inter-cohort comparison, this study also evaluates how rising housing prices influence the importance of economic factors in marital behavior in urban China. We construct a measure of the average housing price at the prefecture level for the period 1990-2000 from the China Urban Construction Statistical Yearbook (1991-2001) and for the period 2001-2008 from the China Regional Economy Statistical Yearbook (2002-2009). These two sources list annually the areas and revenue from new housing unit sales at the city (prefecture) level. We then calculate the average housing price by dividing the total revenue with areas sold. Finally we match the municipality-level average housing prices to each person-year record in the CGSS data.

The mean values of the independent variables are shown separately by sex in our Appendix. We use two time-varying indicators to measure economic prospects: education and employment status. In this study, education is measured by years of schooling. As has been done in past studies (e.g. Raymo 2003; Sweeney 2002; Thornton, Axinn, and Teachman 1995; Xie et al. 2003), we construct an additional measure indicating current school enrollment to distinguish effects of accumulated education from time spent in school. Employment is constructed as a dummy variable, indicating whether the respondent works in a job during each year. As discussed above, to capture potential changes in the advantage of working in the state sector, we include a dummy variable indicating the ownership of the respondent's work unit each year (equals 1 if state-owned).

Following previous studies (e.g. Raymo 2003; Xie et al. 2003), we model the age pattern of entry into marriage with a spline function. Since the legal ages for entering

marriage are different for men and women (ages 22 for men and 20 for women), we use different spline specifications for men and women. Although the sample was restricted to the current urbanites, some respondents might have experienced *hukou* conversion. Hence, the respondent's time-varying *hukou* status is also included as a dummy variable.² As prior research has found that family background characteristics affect marriage formation (e.g., Michael and Tuma 1985), we include father's educational level to measure family's socioeconomic status. Research in the U.S. suggests that marital behavior may vary by race (e.g. Wilson 1987; Bulcroft and Bulcroft 1993). We add ethnicity in our analysis (1 if minority).

5. RESULTS

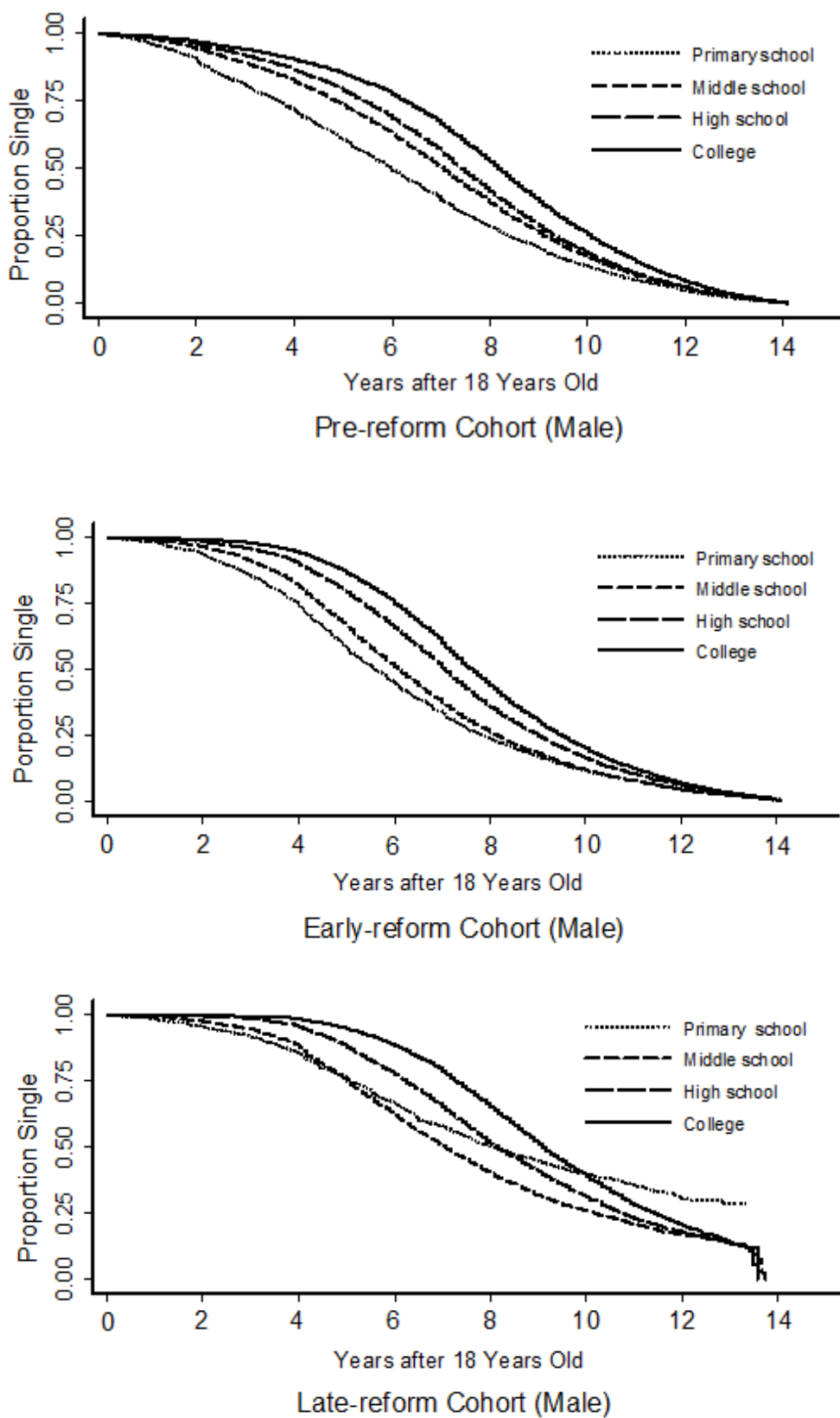
5.1. Changing Patterns of Marriage Timing in China

Using data from the 2005 mini-census, we describe how patterns of marriage timing have changed over different birth cohorts. Let us first focus on the median age, by which half of a birth cohort would be married (hereafter "median marriage age"), and then on the marriage rate by age 25. We find a small increase in the median marriage age between the pre-reform cohort and the late-reform cohort: from 24 to 25 for men and from 21 to 23 for women. However, the median marriage age masks a high concentration of marriages within a narrow marriage age range in China. In fact, an overwhelming majority of marriages occur before age 25, especially for women. For the pre-reform cohort, 63.75% of men and 86.73% of women were married by age 25. For the late-reform cohort, the marriage rate by age 25 declined to 56.76% for men and 79.33% for women. Both the increase in median marriage age and the decline in marriage rate by age 25 suggest a gradual shift in urban China from relatively early and universal marriages to later and more selective marriages.

To examine more closely the changing marriage patterns by socioeconomic status (SES), we plot the Kaplan-Meier survival estimates of transition to first marriage by education for the three cohorts. Figure 1.a shows the results for men.

² By the household registration (*hukou*) system, society in Mainland China has been partitioned into two distinct parts: rural and urban (Wu and Treiman 2007). Almost all aspects of life are different between rural and urban areas.

Figure 1.a. Kaplan-Meier survival curves of transitions to first marriage for urban males by education



For the pre-reform cohort, men with primary school educations were married much earlier than men with higher levels of education. Yet, the educational differences were narrowed for the early-reform cohort and reversed for the late-reform cohort. Figure 1.b shows similar, but less pronounced, patterns for three female cohorts. Taken as a whole, these results suggest that marriage has become more and more a sign of social status in China. In the past, people with less education would enter marriage earlier because they finished school earlier and could more easily find partners. Nowadays, however, persons with less education face a disadvantage in the marriage market because they have lower economic resources. If marriage has become more associated with SES, as suggested in Figure 1, there should be direct manifestations of this at the micro-level. Indeed, in the remainder of this paper, we will use individual-level data to further explore how the effects of economic potential and other determinants of entry into marriage have varied over time or space in urban China.

5. 2. Cohort Comparisons

Using data from CGSS 2003 and CGSS 2008, we now study the changing importance of men's and women's individual-level determinants of marriage across cohorts. We show the results for men in Table 1 and the results for women in Table 2. In both tables, we present the estimated coefficients of the discrete-time hazards model in three separate columns respectively for the pre-reform, early-reform, and later-reform cohorts. Comparing the coefficients of employment status across three cohorts, we see that having a job in the labor market has been increasingly important. For the pre-reform cohort, being employed was not associated with significantly greater odds of marriage, yet for the early-reform and later-reform cohorts, being employed was significantly associated with 67 percent and 621 percent greater odds of marriage respectively. Furthermore, we observe that the effects of employment status on women's marriage behavior are quite different from those on men's behavior. In the pre-reform cohort, women's employment status was associated with a 17.4 percent lower odds of getting married, implying that work and family were completely incompatible for women. Yet such a negative effect of being employed disappeared for the later two cohorts.

Figure 1.b. Kaplan-Meier survival curves of transitions to first marriage for urban females by education

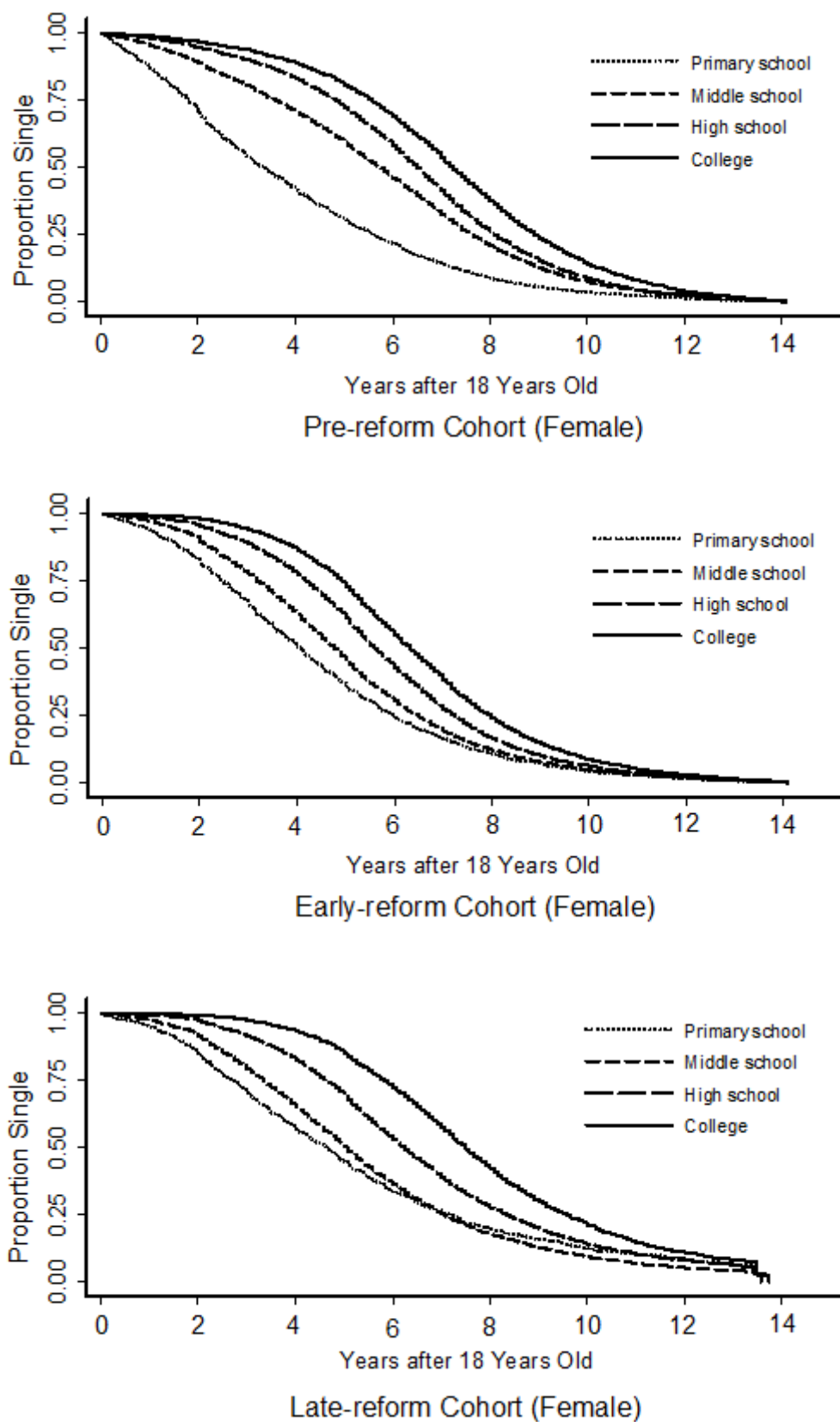


Table 1. Coefficients for Men from the Logistic Regression of Transition to First Marriage on Selected Independent Variables

VARIABLES	Pre-reform Cohort	Early-reform Cohort	Late-reform Cohort
Age (spline function)			
15-21	0.431*** (0.036)	0.647*** (0.0519)	0.671*** (0.0931)
22-25	0.365*** (0.029)	0.351*** (0.034)	0.483*** (0.054)
26-30	0.00284 (0.032)	-0.067 (0.049)	0.150* (0.079)
31-	-0.078*** (0.019)	0.202** (0.082)	0.223 (0.296)
Currently employed	0.138 (0.113)	0.510*** (0.178)	1.975*** (0.486)
Working in state sector	0.307*** (0.077)	0.229** (0.096)	-0.092 (0.148)
Currently enrolled in school	-0.487*** (0.129)	-0.335** (0.142)	-0.414* (0.225)
Years of schooling	-0.016 (0.011)	-0.052*** (0.016)	-0.101*** (0.027)
Father's education (reference group: primary school)			
Middle school	-0.158 (0.120)	-0.184* (0.111)	0.169 (0.155)
High school	-0.263 (0.166)	-0.116 (0.122)	-0.108 (0.187)
College	-0.353* (0.185)	-0.323* (0.187)	-0.135 (0.271)
Urban <i>hukou</i> status	-0.315*** (0.095)	-0.368*** (0.116)	-0.0883 (0.170)
Minority	0.202 (0.164)	-0.329* (0.182)	-0.272 (0.304)
Constant	-11.82*** (0.746)	-16.02*** (1.091)	-17.87*** (2.004)
Observations	15,107	11,068	5,575

a. *** p<0.01, ** p<0.05, * p<0.1

b. Standard errors in parentheses

Table 2. Coefficients for Women from the Logistic Regression of Transition to First Marriage on Selected Independent Variables

VARIABLES	Pre-reform Cohort	Early-reform Cohort	Late-reform Cohort
Age (spline function)			
15-19	0.455*** (0.036)	0.725*** (0.064)	0.667*** (0.094)
20-25	0.265*** (0.020)	0.360*** (0.023)	0.431*** (0.034)
26-30	-0.066 (0.050)	-0.197*** (0.060)	-0.107 (0.117)
31-	-0.124*** (0.031)	0.086 (0.086)	0.796 (0.633)
Currently employed	-0.191** (0.086)	-0.024 (0.132)	0.143 (0.277)
Working in state sector	0.209** (0.086)	0.174* (0.094)	-0.022 (0.142)
Currently enrolled in school	-1.000*** (0.153)	-0.548*** (0.137)	-1.461*** (0.229)
Years of schooling	-0.082*** (0.00979)	-0.059*** (0.014)	-0.102*** (0.021)
Father's education (reference group: primary school)			
Middle school	-0.209 (0.128)	-0.038 (0.102)	0.044 (0.134)
High school	-0.472*** (0.161)	-0.232* (0.133)	0.119 (0.158)
College	-0.444** (0.205)	-0.213 (0.164)	-0.250 (0.295)
Urban <i>hukou</i> status	0.0800 (0.0822)	0.125 (0.096)	0.308** (0.133)
Minority	0.207 (0.146)	-0.111 (0.152)	0.239 (0.200)
Constant	-10.52*** (0.667)	-16.33*** (1.234)	-14.96*** (1.802)
Observations	12,014	10,676	6,357

a. *** p<0.01, ** p<0.05, * p<0.1 b. Standard errors in parentheses

For urban Chinese men, education was not significantly related to marriage in the pre-reform cohort, but significant negative effects are observed for the later two cohorts. For early-reform and late-reform male cohorts, one additional schooling year was associated with 5.1 percent and 9.6 percent lower odds of getting married. Similarly, education had a negative association with marriage for urban Chinese women. For the three cohorts, one additional schooling year was associated with 7.9 percent, 5.7 percent, and 9.7 percent lower odds of getting married respectively. These results are similar to those in a study of Japanese women (Raymo 2003), suggesting that the marriage formation processes in East Asia may differ from those in western countries. Age of first marriage is generally older and more diverse in western countries than that in East Asian countries. This is partly because marriage in the West has been associated with a privileged social status since the Middle Ages (Thornton, Axinn, and Xie 2007), and thus it is difficult for lower-class people, especially men, to marry. As a result, education, representing economic potential (Xie et al. 2003), is a major resource in the marriage market that speeds up marriage. In East Asian countries, universal and early marriage has long been practiced (Thornton and Lin 1994). Due to a role conflict between education and marriage (Thornton et al. 1995; Thornton et al. 2007), education is associated with later marriage formation. Our results provide some empirical support for this difference in marriage patterns between Western and Eastern countries.

By comparing results across cohorts in Tables 1 and 2, we observe a decline in the advantage of working in the state-owned sector in marriage formation for both men and women. For urban Chinese men, working in the state-owned sector was significantly associated with 35.9 percent greater odds of getting married in the pre-reform cohort, but the positive effect declined to 25.7 percent greater odds in the early reform cohort and disappeared in the late-reform cohort. For urban Chinese women, the results from Table 2 show a similar pattern. In the pre-reform and early reform cohorts, working in the state-owned sector significantly increased women's odds of getting married by 23.2 percent and 19.0 percent, but this positive effect no longer existed in the late reform cohort.

Across the three male cohorts, the coefficients of age spline show an inverted-U shape as found in past research: increasing rapidly between ages 15 and 22, slowing down in the middle 20s, plateauing in the late 20s, and declining thereafter. The age pattern for women is similar, again implying a non-linear effect. As in the previous studies, school enrollment is

associated with lower odds of marriage for both men and women. For men, the marriage-delaying effect of school enrollment has not changed much over cohorts. Yet for women, the negative effect of schooling enrollment is especially pronounced in the late-reform cohort. This finding is perhaps due to the high enrollment rates in high school and college among the late-reform cohort of women (Wu and Zhang 2010).³ Moreover, for men, rural *hukou* status was associated with a higher likelihood of getting married only in the pre-reform and early-reform cohorts, but not in the late-reform cohort. Yet for urban Chinese women, the advantage of having an urban *hukou* for marriage formation existed only among the late-reform cohort: urban *hukou* was associated with a 36.1 percent increase in the odds of marriage. Furthermore, ethnicity in urban China was not significantly related to entering marriage for either men or women. Finally, father's education did not have a significant impact on marriage formation among men. For women, father's educational level was negatively associated with marriage likelihood only for the pre-reform cohort.

In summary, the analysis from cohort comparisons reveals certain changes in the effects of individual-level social determinants for transition to first marriage in urban China. First, economic prospects, especially employment status, became more and more important for both men and women. Furthermore, working in the state-owned sector lost relative significance across the three cohorts. Finally, to our surprise, we did not observe an increasing trend in the importance of education. However, we hesitate to interpret the last finding as direct evidence contradicting our main thesis that economic factors have become more important in determining marriage entry in reform-era China.

As Oppenheimer (1988) has argued, individuals with higher levels of education may experience a prolonged search period, since they may have higher standards for potential spouses and can afford to take time in choosing partners. Because of this, education may affect marriage formation in two opposing ways. On the one hand, people with more education may have better economic prospects, which might increase their likelihood of

³ If we include the interaction between educational level and enrollment status based on the model used in Table 2, we can observe that the larger negative effect of enrollment on marriage formation in the late-reform cohort found in Table 2 results primarily from the larger negative effect of high school enrollment and college enrollment.

finding a spouse.⁴ On the other hand, highly educated people may have greater difficulty in finding satisfactory matches and thus may wait longer to get married. To properly understand the role of education, we examine its theoretical implications over different geographic contexts during a relatively stable period. We now turn to such an analysis in the next section.

5.3. Moderating Effects of Housing Prices

To gain a better theoretical understanding of the role of education in marriage entry, we now explore spatial implications of educational effects for the latest period, capitalizing on the regional variation in housing prices resulting from the housing reform in urban China. We ask how the education effect may be moderated by local housing prices. We expect education to play a more positive role in cities where housing prices are higher – i.e., where pressure for economic factors is higher.

We compiled data on housing prices since 1991. To match the housing prices data, we restrict our CGSS sample to contemporaneous urbanites who began to be exposed to marriage after 1990 (i.e. those born after 1975). In Tables 3, we present the key results of this exercise for men and women. In the first and third columns (Models 1 and 3) of Table 3, we add the linear function of the local average housing prices to the earlier model specification in Tables 1 and 2.⁵ Overall, for both men and women, housing price does not have a significant overall impact.

Exploring whether local housing prices moderate the effect of education, we add its interaction with education in Model 2 (for men) and Model 4 (for women).⁶ We observe strong and significant interaction effects between local housing prices and education. The “main” effect of education (i.e., when local housing prices are set to zero) is negative. The positive signs of the interactions between education and housing price suggest that for both men and women, the negative effect of education on marriage formation declines as the average housing price increases.

⁴ As discussed in past literature, the educational return to income increased significantly during the economic reform era (Hauser and Xie 2005).

⁵ We do not show the coefficients of other control variables in Table 3, as the coefficients are similar to those for the late-reform cohort in Tables 1 and 2.

⁶ We add a variable indicating whether the respondent was born before 1982 to control the influence of higher education expansion in China around 2000.

Table 3. Models for Men and Women of Transition to First Marriage including Housing Price⁷

	Male		Female	
	Model 1	Model 2	Model 3	Model 4
Schooling Years	-0.113*** (0.0323)	-0.229*** (0.0526)	-0.130*** (0.0274)	-0.175*** (0.0373)
Housing price (10000 RMB)	0.360 (0.487)	-5.490** (2.166)	-0.152 (0.404)	-2.951* (1.639)
Housing price*schooling years		0.462*** (0.166)		0.226* (0.128)
Constant	-18.90*** (2.530)	-18.48*** (2.550)	-22.26*** (3.201)	-22.05*** (3.207)
N	3,914	3,914	4,629	4,629

a. *** p<0.01, ** p<0.05, * p<0.1 b. Standard errors in parentheses

Figures 2.a and 2.b depict, respectively for men and women, the predicted probability of getting married per year by years of schooling at different levels of the average housing price based on regression results of Models 2 and 4.⁸ The broken and dotted lines denote the predicted relationship between years of schooling and risk of marriage when housing price is set to 2,528 RMB (average housing price of urban China in 2008) per square meter. Here, we observe a negative association between educational level and probability of getting married for both men and women. We set a local average housing price at a level where education will have no effect on marriage, represented by the dotted lines. Such housing prices (tipping points) are respectively 4,956 RMB per square meter for men and 7,699 RMB per square meter for women. The broken and solid lines respectively show the predicted relationship between years of schooling and risk of marriage when housing price is 10,000 RMB and 14,091 RMB (highest housing price in 2008) per square meter for men and women. In contrast to the relationship at a low housing price, a positive association between education and probability of getting married is observed.

⁷ All the variables in Table 1 and Table 2 are controlled.

⁸ The values were computed from Models 2 and 4 in Table 3, assuming that the male and female respondents are both 23 years old, that the respondent is currently employed, that the respondent does not work in the state sector, that the respondent is not currently enrolled in school, that the respondent owns an urban *hukou*, that the ethnicity of the respondent is Han, and that the respondent was born before 1982. The unit of housing price is 10,000 RMB per square meter.

Figure 2.a. Effects of years of schooling on marriage risk at different levels of housing price for men

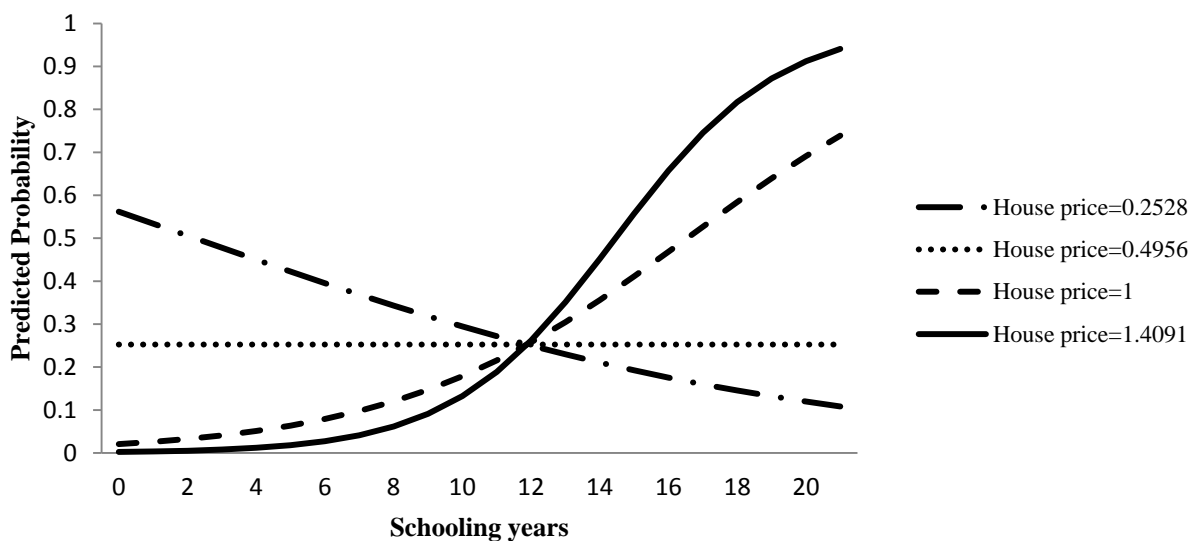
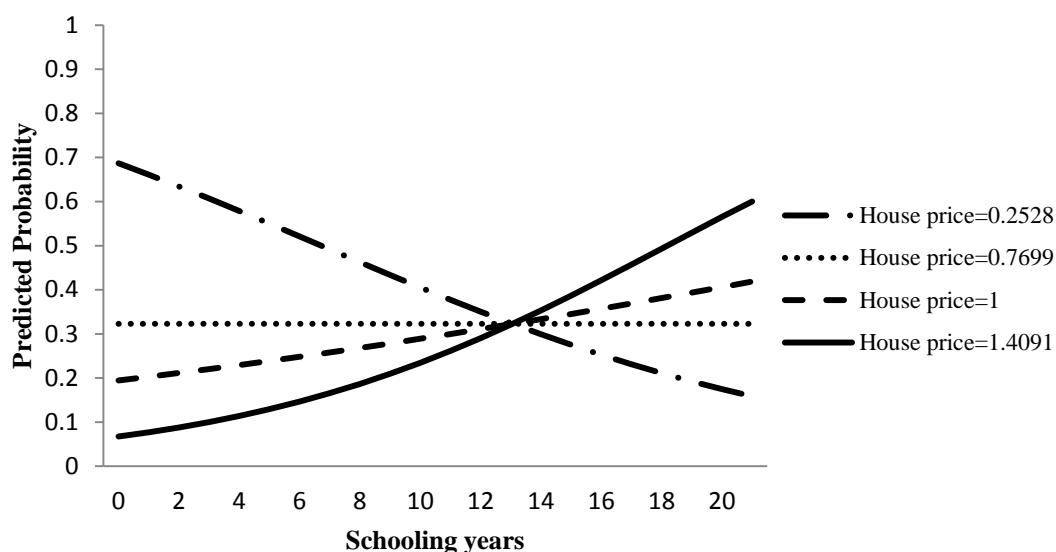


Figure 2.b. Effects of years of schooling on marriage risk at different levels of housing price for women



Taken together, the results indicate the varying effects of education on marriage with housing prices: on the one hand, in the areas where housing prices are relatively low, education mainly has a marriage-delaying effect, suggesting that people with more education may be able to afford to wait longer; in the areas where housing prices are relatively high, education has a marriage-promoting effect, as people with more education may be seen as attractive partners in such marriage markets.

In summary, we find that macro-level local housing prices moderate the effects of micro-level education on marriage entry for both men and women. In cities with lower housing prices, most young people enter marriage early according to traditional norms. Given the role conflict between school enrollment and marriage, people who receive more education marry later, resulting in the negative effect of education on marriage formation. In cities with higher average housing prices, persons with higher education are more attractive in the marriage market, because they can better afford housing costs. This advantage becomes more pronounced as local housing prices are higher.

6. CONCLUSION AND DISCUSSION

Previous studies on marriage formation have failed to settle the debate regarding the changing effects of economic prospects. For example, Sweeney (2002) found an increasingly positive role of women's economic prospects in the U.S., but Raymo (2003) reported that higher levels of education among women are associated with lower likelihoods of marriage in Japan. For men, although most researchers have acknowledged a significant positive effect of economic potential on marriage formation (Oppenheimer and Lew 1995; Xie et al. 2003), previous research has not found significant changes in such effects over time. We contribute to the literature on the determinants of marriage formation by situating marital behavior in a society that has undergone rapid social changes – urban China in recent decades.

In general, our results suggest that employment status has become increasingly important in marriage formation for both men and women in urban China. The influence of educational attainment is complicated, as it varies with local housing prices. For both men and women, years of schooling have a positive impact on marriage entry if local housing prices reach a certain level. The interaction pattern is such that economic prospects are more important in cities with high housing prices, where persons with higher levels of education and higher incomes enjoy an advantage.

To further explore how the housing reform in China may have affected the timing of transition to first marriage, we plot of relationship between the median marriage age (based on 2005 mini-Census) and the average housing price across cities for the most recent cohort, for men in Figure 3.a and for women in Figure 3.b. The figures show a positive association between average housing price and median marriage age for both men and women. It means that persons living in cities with higher housing prices wait longer for marriage, during which they can accumulate wealth to offset a high cost of owning a housing unit. Combining this

result with an earlier result of a stronger positive effect of education on marriage when local housing prices are higher, we conclude that high housing prices not only delay marriage timing overall but also particularly deter poorly educated people from marriage.

Figure 3.a. Relationship between city-level house price and median marriage of men

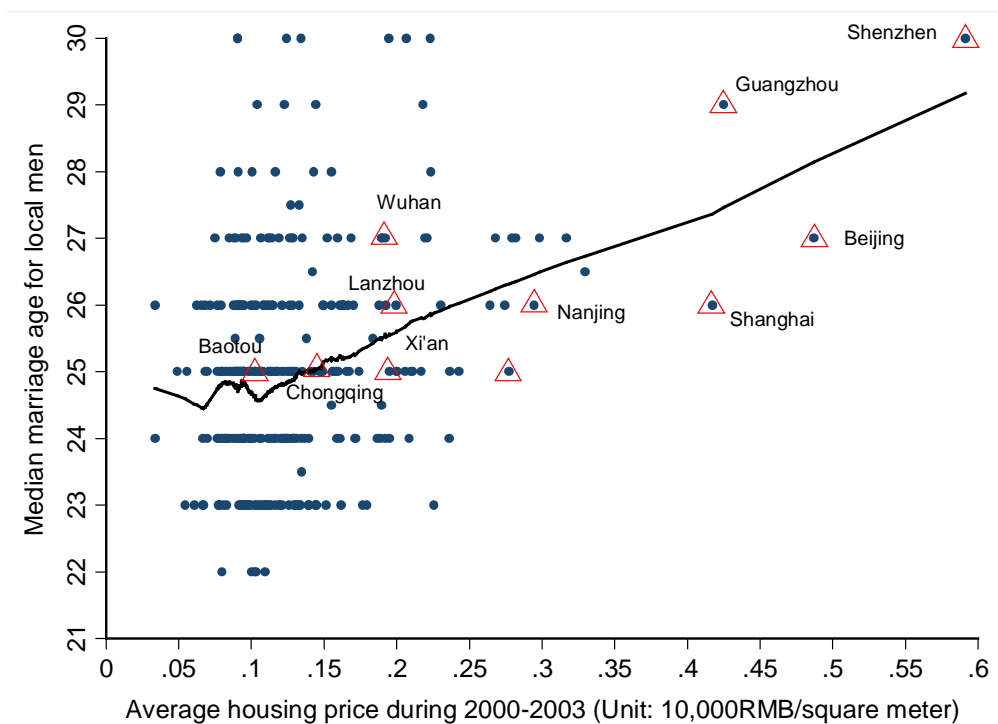
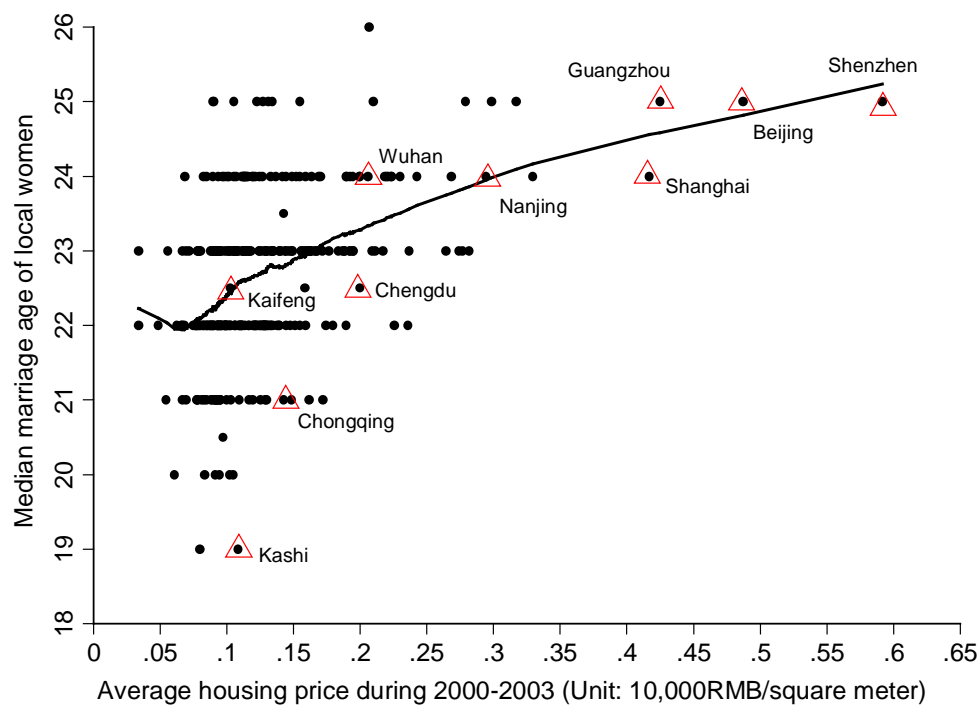


Figure 3.b. Relationship between city-level house price and median marriage of women



Notes: We use locally weighted scatterplot smoothing to make Figures 3.a; the bandwidth is set to be 0.8.

This study has also examined how institutional changes have mattered for marriage formation within the Chinese context. As a result of privatization and marketization during the economic reform, the advantage of working in the state sector has declined and finally disappeared over successive cohorts. Thus, another contribution of this study is our demonstration that a study of micro-level determinants of marriage entry could benefit from a consideration of macro-level institutional contexts.

As with most studies on this topic, our work is limited in dealing with social determinants of marriage for men and women separately. Future work will profit from extending the traditional single-sex models to two-sex models, considering both the exposure variability for meeting potential marriage partners (Zeng and Xie 2008) as well as the true preferences of both men and women (Logan, Hoff, and Newton 2008). Such integrative models will enable us to better understand the forces of the interactions between men's and women's personal attributes on marriage within larger, ever-changing social contexts.

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