

Trends of Marital Age Homogamy in China, 1929-2005:

A Marriage Cohort Perspective*

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Abstract: Marital age homogamy, compared to other forms of social homogamy, receives less academic attention. This paper, using a random sample of the nationally representative China 2005 1% Population Inter-census Survey, based on log-multiplicative layer effect models and crossings models, investigates the trends of age homogamy in contemporary China with a sharp focus on the reform-era. As expected, empirical results show an inverted U-shape trend of age homogamy in reform-era China, which may be due to the reversal to “necessity considerations” of women during mate-selections process in coping with increasingly severe market competition in the late post-reform era. This pattern of reversal is further supported by the lowered barriers in the most recent years for all groups of female age at first marriage, except for those crossing the boundary of age twenty. This indicates young females of 20-24 are more likely to cross the barriers all the way towards age hypergamy.

This paper presents the trends of the marital age homogamy along modern China's crucial political eras. A focus is cast on the patterns of age homogamy from pre- to post-reform era: a period of rapid economic growth, sharp rise in standard of living and consumer aspiration, as well as increasingly severe market competitions. The trends could be driven by two opposing social forces entailed by different stages of the economic reforms: On one hand, the fast processes of development, especially those introduced by economic reforms, may promote greater gender equality as well as love-based marriage and thus reduce spousal age gaps; on the other hand, with economic reforms implemented more widely and thoroughly, increasingly severe competition for socioeconomic resources may prompt more women to retreat to the "strategy of necessity" by finding much older husbands with established social and professional status. Therefore, the direction of the trends is unknown and subject to an empirical test.

The Theoretical Motivations and Research Setting

Empirical studies of trends of age gap between spouses usually only focus on a short period of time, capitalize on non-representative data sets or employ comparatively crude research techniques (one of the exceptions is Poppel et al. (2001)). Our study, with a specific focus on marriage cohorts in reform-era China located in the grand picture of China's process of development, covers a time span of almost 70 years from 1929 to 2005 with a random sample of the nationally representative 2005 1% inter-census survey. We will provide thick descriptions of the trends of marital age homogamy both by basic descriptive statistics and a set of log-multiplicative layer effect models with year of marriage as the layer variable. We also utilized crossings models to investigate which parts of the distribution of age at first marriage leads to the resulting trends of age homogamy.

Marital Age Homogamy

Social homogamy is often used to examine the changes in the bases of social stratification, especially in the process of industrialization and development. As widely established both theoretically and empirically, the course of development is characterized by the decrease of homogamy based on ascribed attributes and increase of homogamy based on achieved attributes (Poppel et al. 2001). Therefore, age homogamy is especially intriguing in that although age is an ascribed characteristic, it is well indicative of various achieved attributes, such as education and economic potentials. Moreover, large age differences with older husbands are believed to better reinforce the classic man-dominant-women marriage. Hence, the trend towards smaller age gaps between spouses has been explained as well reflective of a shift towards increasing gender equality which occurs as a key phenomenon during the course of development in modern societies (Bozon 1991; Poppel et al. 2001).

Economic Reforms and Development in China

The increasing gender equality along with development may also be true for modern China, especially for its reform era since the early 1980s. Firstly, resources are more affluent with the fast economic growth and females are more likely to receive higher education and participate more in labor force (Mare 1991; Xie et al 2003; Hannum 2005; Song forthcoming); secondly, the increasing intergenerational equality along with the stronger emphasis on individual freedom and equality, as well as the implementation of the Marriage Law in 1950 which disrupted traditional arranged marriage and legalized free choice marriage, both have driven the marriage pattern towards age homogamy (Thornton 2001; Song forthcoming). The second reason holds true is due to the fact that with the authority of parents (Kalmijn 1991, 1998) weakening, the traditional picture of age-mating gradient norms and man-dominant-woman sex-role relations would be more likely to fade out (Casterline 1986; Wheeler et al 1987; Bozon 1991; Poppel et al. 2001). Young women are more likely to carry out their mate-selection process based on romantic love rather than instrumentality considerations. Since men's sexual attractiveness generally decreases and socioeconomic status increase with age, this modern mate-selection norm is more likely to direct to smaller age differences between brides and grooms (Wheeler et al 1987; Bozon 1991; Poppel et al. 2001).

However, we may need to be discretionary here for modern China. The changing levels of implementation of the economic reforms may result in social forces of different, or even opposite directions. From the side of brides, with the increasingly severe competition within the labor force market, there is a likely tendency of rising number of young women reversing their mate-selection criteria back to the "strategy of necessity" by choosing older husbands who are more likely to possess higher social status and better economic potentials (Bozon 1991). From the side of grooms, with women having higher educational attainments and greater economic resources, the "fields of eligibles" for men are becoming more limited and the costs within the marriage market are much higher (Casterline et al 1986; Oppenheimer 1988; Xie et al 2003). To become more attractive within this increasingly competitive marriage market, men may need to wait longer in order to accumulate more social, cultural and economic resources.

These two counter-direction social forces along different phases of economic reforms indicate that the patterns for age homogamy in reform-era China may be quite uncertain. Moreover, age homogamy and economic reforms are jointly correlated with other significant social processes, the most prominent two of which are increases in age at first marriage and educational attainment (Bytheway 1981; Atkinson et al 1985; Bhrolchain 1991; Stier et al 1994; Todd et al 2005). This adds more uncertainties to the trends and further justifies the necessity to study them.

Educational Attainment, Age at First Marriage and Other Social Processes

There are three main factors determining the levels of social homogamy (Kalmijn 1991, 1998): the preferences of marriage candidates for certain traits in a spouse, the authority imposed by the “third party” during the mate-selection process and the structure and constraints embedded in the marriage market. The first is related with the choice between “love or necessity”, the second is presented by the decrease of parental influence during mate-selection, and the third is tightly correlated with the social changes happening in the domain of education:

Firstly, along with the development especially with the initiation of the economic reforms, average years of schooling received have markedly increased. On one hand, it may enable schools to become an important location for mate-selection, and increase homogamous marriages with potential couples being more likely to be classmates or schoolmates (Mare 1991). On the other hand, however, progressively stronger market competitions and higher costs to establish a new family may force young people to postpone their marriages even after finding out their future spouses or all in all delay their mate-selection till the completion of schooling. This may lead to lower chances to search for and meet one’s spouse in school; instead, one is more likely to find their potential spouse in workplaces or other more socially heterogeneous occasions.

Secondly, with the lengthened education completion and the increase in age at first marriage, the time gap between departure from school and age at first marriage was also subject to change. Generally, the longer the gap is, the greater the chances for heterogamy (Mare 1991; Schwartz and Mare 2005). However, the tempo of change for education and age at first marriage may be quite inconsistent, and the resulting time gap could be unclear and subject to varying influences of social processes. In China, there is a deeply rooted saying that “start a family first then start a career” (“cheng jia li ye”), so it is reasonable to assume that it may take long for the age at first marriage to significantly change. We may expect the increase of age at first marriage to lag behind the extension for education completion, which may result in firstly a decrease and then an increase in the time gap and correspondingly, increase in age homogamy at early stages of development and the reform-era and then decrease at the late reform-era.

Thirdly, the rise in female education could play quite unique roles in the resulting marriage outcomes. Although social development has brought about more equal gender roles, the convention of hypergamy in terms of socioeconomic characteristics still keeps salient and powerful (Raymo 1998, 2003a, 2003b; Raymo and Iwasawa 2005). Women, even for those highly-educated, may still prefer to marry men who are of higher education or more affluent resources than they themselves are. Therefore, the increase of highly-educated women may result in a “marriage market squeeze” (Raymo 1998, 2003a, 2003b; Raymo and Iwasawa 2005). For the “inflated” pool of female marriage candidates, the potential “qualified” males with similar or higher education are becoming much more limited. This convergence of education for males and females may lead women to pursue hypergamy by looking for older husbands who are more likely to be richer. Again, it may take time for the phenomenon of females receiving higher education to become rather prevalent, which goes consistent with our general conjectures of a firstly increase and then decrease in the levels of marital age homogamy.

Fourthly, it is widely established that increased age at first marriage is positively related with the occurrence of heterogamy (Vera et al. 1985; Poppel et al. 2001). In China, there are several concurrent social processes propelling the increase of age at first marriage aside from the extension of education. Note that one common trait shared by those processes is that they all take time to happen and then entail noticeable changes at the societal level. The first is the rising prevalence of the norm of marrying later, which is driven by the increasing contradictions between marriage/family and the success of education and careers (Thornton et al. 1995). However, with the abovementioned Chinese notion of “start a family first then start a career”, it is reasonable to assume that we may wait till the recent reform-era, with the increasingly severe competition and inflated costs to establish a new family, later marriages may be more preferred. A second potential factor may be the prevalence of low fertility, which is further strengthened in China by the implementation of the one-child policy. Moreover, previously, childbearing have been tightly related with marriage, in order to achieve a certain desired number of children, one may need to marry young. However, nowadays both pressures – number of children and childbearing within wedlock – have been mitigated. People may postpone their first marriages accordingly while still being able to complete childbearing “on time”. A third factor could be the increasing prevalence of cohabitation and remarriage. Recently marriage starts to lose its dominance in China. Instead, premarital sex and cohabitation has become more

acceptable. Moreover, married people face smaller pressures to get divorced and then remarry. Cohabitation/higher-order marriages are shown to be positively related to the age at first marriage (Atkinson et al. 1985; Vera et al. 1985; Stier et al. 1994). One explanation is that people choosing cohabitation and divorce may be a highly self-selected group. They tend to be more afraid of responsibility and marriages (Thornton et al 2007). Therefore, even though they may start mate-selection as early as during school years, they may get “finally settled down” late. Those resulting marriages are more likely to be late and happening in workplaces or other social locations and may tend to be heterogamous. In sum, all the above three social processes entailing late age at first marriage may take long to happen and finally play a noticeable role in the trends of marital age homogeneity. In our specific case, we may expect to wait as late as recent post-reform China to witness those processes be widely conducted and considerably influence age at first marriage and then levels of age homogeneity in the theoretically expected directions.

Data and Methods

This paper is based on a random sample of the China 2005 1% Population Inter-census Survey. The data is restricted to those aged 15 and older. Due to the difficulty of identifying specific couples out of multiple couples within each household, we restrict the data to heads of the households and their spouses. Moreover, since the data only includes variables of “current marital status” and “age at first marriage”, including couples not in their first marriages may confound the resulting patterns of the age homogeneity. Therefore, the data is further restricted to couples both in their first marriages. These restrictions result in a total of 418,181 couples. To document the trends of age homogeneity, descriptive statistics and log-multiplicative layer effect models (Xie 1992, 1998) are employed; a set of crossings models are used to gain insight into how the distributions of age at first marriage generate the trends in marital age homogeneity.

Log-multiplicative Layer Effect Model

Log-multiplicative layer effect model with different specifications for the HW two-way interactions can capture how the association between husbands’ and wives’ ages at first marriage evolves with time. The interpretations will be based on the assumption that with the HW two-way associations being stronger, the levels of marital age homogeneity should be higher, and vice versa. The resulting trends should be well indicative of the influences imposed by the process of the economic reforms located within the grand picture of modern China and in comparison with other influential social events. The general model for the three-way table of wife’s by husband’s age at first marriage by year of marriage is:

$$\log(F_{ijl}^{HWP}) = \mu + \mu_i^H + \mu_j^W + \mu_l^P + \mu_{ii}^{HP} + \mu_{ji}^{WP} + \mu_{ij}^{HW} + \mu_{ijl}^{HWP} \quad (1)$$

in which H and W respectively denotes husband’s and wife’s age at first marriage in five-year age groups (19-, 20-24, 25-29, 30-34, 35+), and P denotes the year of first marriage (an exception is the combination from 1929 to 1948 due to the sparse cells for those early marriage cohorts). Since the research focus is on the HW two-way interaction and HWP three-way interaction, all first-order effects and other interactions will be saturated. By log-multiplicative layer effect model, the HW two-way interaction and the HWP three-way interaction will be jointly estimated by the term $\psi_{ij}\phi_l$, in which ψ_{ij} ’s indicate the pattern of the HW two-way association, and ϕ_l ’s represent the varying levels of the HW association for different marriage cohorts (Xie 1992). Three design matrices will be constructed to specify the HW interaction ψ_{ij} within the HWP interactions. As shown in Figure 1, specification M will be used to partial out the potential diagonal biases while placing no restrictions on age homogenous pairings. Specification D will, aside from saturating the diagonal cells, adds extra parameters to depict the varying probabilities of crossing

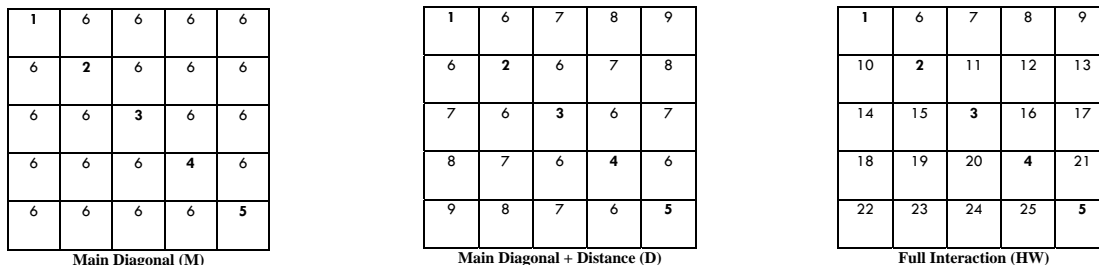


Figure 1. Design Matrices for the Association between Spouses’ Age at First Marriage

the age-group boundaries with regard to the changing distances from the main diagonal (Raymo and Xie 2000). A third set of models will saturate the HW two-way interactions.

Special attention will be given to the following seven political periods (Xie et al. 1996; Wu et al. 2003; Song forthcoming) so as to locate the pattern of age homogamy in reform-era China within other theoretically relevant periods for comparison purpose: 1) Before the foundation of People's Republic of China (PRC) (Before 1949); 2) Before the Cultural Revolution (1949-1965); 3) Cultural Revolution (1966-1977); 4) Economic reform started in rural areas (1978-1985); 5) Economic reform started in urban areas (1986-1991); 6) Early post-reform era (1992-1995, large-scale transformation of state-owned enterprises into joint-stock companies); 7) Recent post-reform era (1996-2005, widely implemented financial and fiscal reforms). We can have a better sense of the scales and levels of the trends by locating the reform-era within the broad historical horizon of modern China. However, the driving forces of age homogamy within those seven periods are substantively different. From before 1949 to foundation of PRC, we may expect increased age homogamy due to the implementation of Marriage Law as well as other social propaganda for gender equality. Towards Cultural Revolution, mixed patterns may occur due to the highly disturbed structure of interaction opportunities for potential homogamous mates (Kalmijn, 1991; Song, forthcoming). For the economic reform era, there might be increased age homogamy in the early phases and then decreased age homogamy when the reforms were enforced more widely and thoroughly.

Crossings Model

The crossings model is $\log(F_{ijl}^{HWP}) = \mu + \mu_i^H + \mu_j^W + \mu_l^P + \mu_{il}^{HP} + \mu_{jl}^{WP} + \mu_{ij}^{HW} + \mu_{ijl}^{HWP}$, where $\mu_{ijl}^{HWP} = \sum_{q=j}^{i-1} \mu_{ql}$ for $i > j$, $\mu_{ijl}^{HWP} = \sum_{q=i}^{j-1} \mu_{ql}$ for $i < j$, and $\mu_{ijl}^{HWP} = 0$ for $i=j$ (Mare 1991; Schwartz and Mare 2005). μ_{ql} shows the change in the difficulty of crossing age barrier q in year l relative to the reference period (1929-1948).

Crossings model is more suitable for the task of investigating which parts of the distribution of age at first marriage generate the resulting trends of age homogamy than the models based on the design matrix D . It not only allows us to estimate the varying difficulties of crossing barriers with changing distances from the main diagonal, but also provides the specific chances of marriage for couples in adjacent age categories relative to the chances of homogamy (or other intended reference groups). Moreover, due to the uniformly sparse cells of age hypogamy along time, the chances of crossing age barriers for hypogamous marriages at different age categories should generally be equivalently low. The varying difficulties of crossing age barriers are more applicable to hypergamous pairings. To capture this asymmetry in the difficulty of crossing age barriers, we devise two additional sets of parameters accordingly, either assigning same parameters to hypogamy as those for homogamy (C'):

$\mu_{ijl}^{HWP} = \sum_{q=j}^{i-1} \mu_{ql}$ for $i > j$ and $\mu_{ijl}^{HWP} = 0$ for $i \leq j$) or assigning one extra parameter to all hypogamous pairings ($C''+O$: $\mu_{ijl}^{HWP} = \sum_{q=j}^{i-1} \mu_{ql}$ for $i > j$, $\mu_{ijl}^{HWP} = \mu_l$ for $i < j$, and $\mu_{ijl}^{HWP} = 0$ for $i=j$).

Discussions

Based on results from descriptive statistics and log-multiplicative layer effect models, uniform patterns show as expected. Along the process of development in China, there was a salient increase in marital age homogamy. This increasing tendency continued into the early post-reform China. However, with the economic reform implemented more widely and thoroughly, a sharp decrease in marital age homogamy occurred, which may be driven by the reversal to necessity consideration of young women in mate-selection processes in the face of increasingly severe market competition pressure. This pattern of reversal is further supported by the lowered barriers in the most recent years for all groups of female age at first marriage, except for those crossing the boundary of age twenty. This indicates young females of age 20-24 are more likely to cross the barriers all the way towards age hypergamy in the most recent post-reform China.

For preliminary results, please see Table 1-2 and Figure 2-6.

Table 1. Goodness-of-Fit Results of Log-multiplicative Layer Effect Models, China 1929-2005

Model	Description	L^2	d.f.	BIC
Baseline model	PW, PH	106968.20	928	94956.48
Model A				
(A-1) : M	PW, PH, M	43505.23	923	31558.22
(A-2) : D	PW, PH, D	3250.78	920	-8657.40
(A-3) : WH	PW, PH, WH	2878.51	904	-8822.57
Model B				
(B-1) : M ϕ_l	PW, PH, M ϕ_l	42169.19	866	30959.97
(B-2) : D ϕ_l	PW, PH, D ϕ_l	2335.06	863	-8835.32
(B-3) : WH ϕ_l	PW, PH, WH ϕ_l	2009.21	847	-8954.08

Notes: Baseline model is the conditional independence model assuming no association between spouses' age at first marriage. M=main diagonal; D=main diagonal + distance. Model A's are the homogeneous model; Model B's are the log-multiplicative layer effect model. L^2 is the log-likelihood ratio chi-square statistic with the reported degrees of freedom. $BIC=L^2-(d.f.)\ln(N)$, where N is the number of observations (418,181). All models were estimated using the LEM software package (Vermunt 1997).

Table 2. Goodness-of-Fit Results of Crossings Models, China 1929-2005

Model	L^2	d.f.	BIC
PW, PH	106968.20	928	100213.00
PW, PH, M	43505.23	923	36786.42
PW, PH, D	3249.15	920	-3447.83
PW, PH, M, A	16776.80	922	10065.27
PW, PH, D, A	3238.53	919	-3451.16
PW, PH, WH	2878.51	912	-3760.23
PW, PH, M, PC	1357.24	693	-3687.33
PW, PH, M, A, PC	1325.63	692	-3711.66
PW, PH, M, PC, PA	1135.69	635	-3486.68
PW, PH, D, PC	1316.36	691	-3713.65
PW, PH, D, A, PC	1280.15	690	-3742.58
PW, PH, D, PC, PA	1089.93	633	-3517.87
PW, PH, WH, PC	1112.00	684	-3867.05
PW, PH, WH, PC'	1112.00	684	-3867.05
PW, PH, WH, PC', PO	1006.82	627	-3557.31
PW, PH, WH, PC, PA	928.82	627	-3635.31

Notes: Baseline model is the conditional independence model assuming no association between spouses' age at first marriage. M=main diagonal; D=main diagonal + distance; A=asymmetry; C=crossing; C'=hypergamous crossing; O=hypogamy. L^2 is the log-likelihood ratio chi-square statistic with the reported degrees of freedom. $BIC=L^2-(d.f.)\ln(N)$, where N is the number of observations (418,181). All models were estimated using STATA.

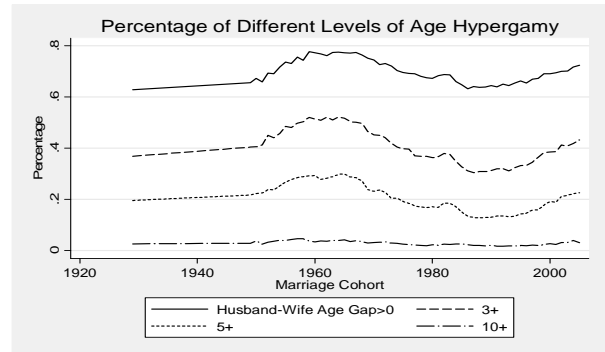
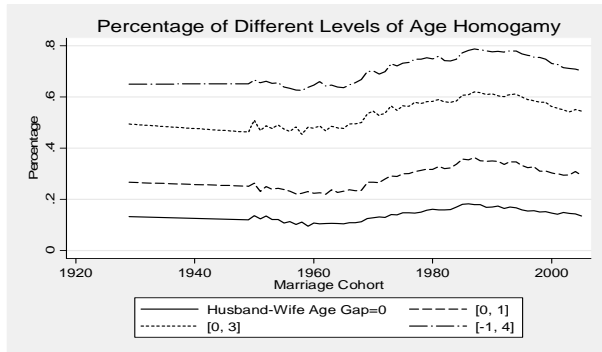


Figure 2. Percentage of Different Levels of Age Homogamy and Hypergamy for Marriage Cohorts 1929-2005

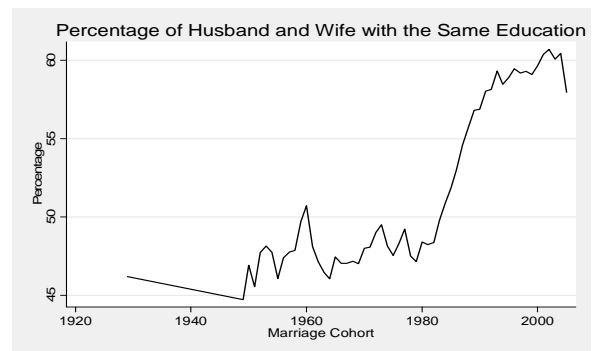
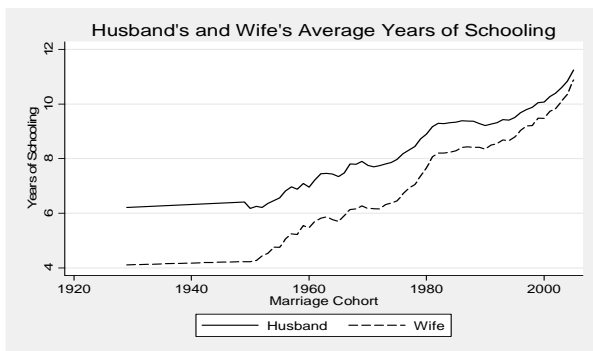


Figure 3. Average Years of Schooling of Husbands and Wives for Marriage Cohorts 1929-2005

Figure 4. Percentage of Husbands and Wives with the Same Education, Marriage Cohorts 1929-2005

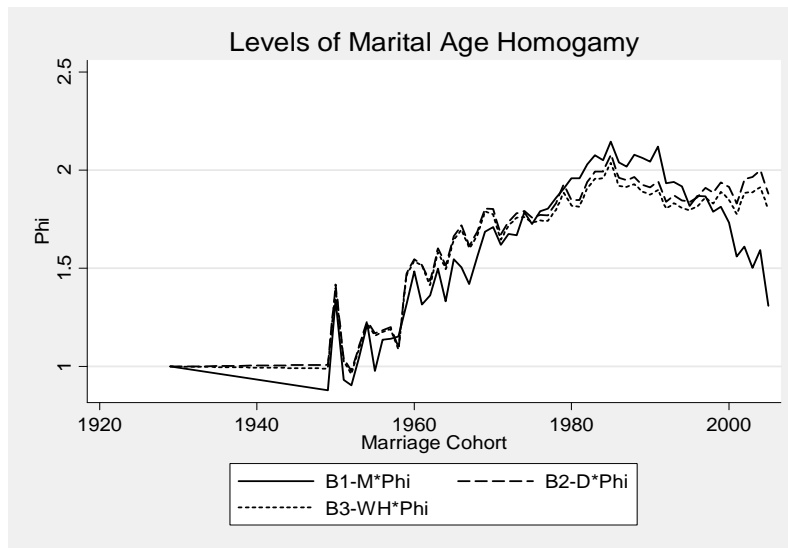


Figure 5. Levels of Marital Age Homogamy for Marriage Cohorts 1929-2005

Notes: Respectively based on estimated ϕ_l 's from log-multiplicative layer effect models: (B-1) : $M \phi_l$, (B-2) : $D \phi_l$, and (B-3) : $WH \phi_l$.

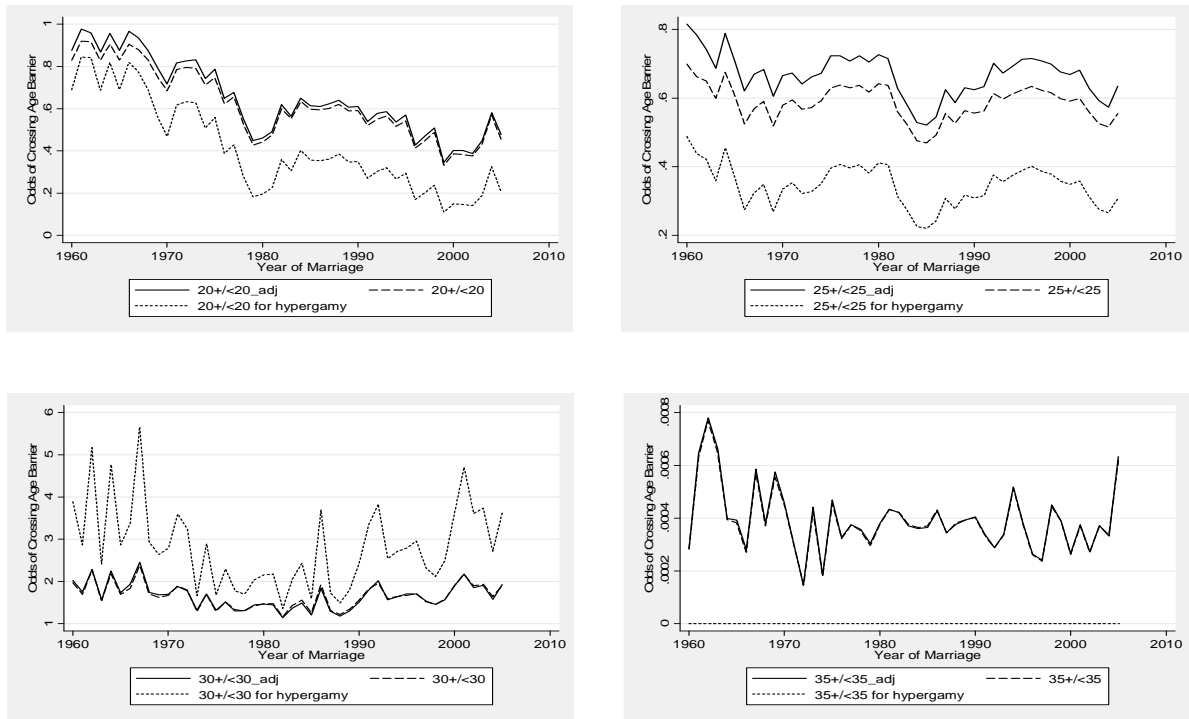


Figure 6. Odds of Crossing an Age Barrier: China, 1929-2005

Notes: Respectively based on the exponential results of the estimated μ_{ijl}^{HWP} 's from crossings models: PW, PH, WH, PC, PA; PW, PH, WH, PC; PW, PH, WH, PC'. Model (PW, PH, WH, PC, PA) adjusted for the asymmetric chances of hypergamy and hypogamy by an additional parameter A; Model (PW, PH, WH, PC) is the standard crossings model; Model (PW, PH, WH, PC') assumes varying difficulties of crossing age barriers only exist for hypergamy by design of $\mu_{ijl}^{HWP} = \sum_{q=j}^{i-1} \mu_{ql}$ for $i > j$ and $\mu_{ijl}^{HWP} = 0$ for $i \leq j$.

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