

The Timing of Marriage in China

Lixin Colin Xu

*The World Bank, 1818 H Street, NW, Washington, DC 20433, USA
Guanghua School of Management, Peking University, Beijing, 100871, China*

Christine Zhen-Wei Qiang

The World Bank, 1818 H Street, NW, Washington, DC 20433, USA

and

Limin Wang*

The World Bank, 1818 H Street, NW, Washington, DC 20433, USA

This paper studies the marriage timing decisions of young men and women in China. The data set is a sample of Chinese couples with ample variations in marriage market features, personal characteristics, and regional patterns of growth. Exploiting the differences in marriage timing among the couples in our data set, we find empirical results that are largely consistent with the notion that marriage gains, search costs, and job complexity determine the timing of marriage. In particular, marriage is likely to be delayed for urban (but not rural) men and women with higher wage. Regional economic growth appears to slow down the tendency to get married for both men and women and in both cities and the countryside. Access to network of young people (via the Communist Youth League) facilitates marriage for all young people. Better-educated young people tend to get married later in life. © 2003 Peking University Press

Key Words: Marriage timing; Job complexity; Search costs; School-to-work transition.

JEL Classification Numbers: J1, O1, D1.

* We are grateful to George Clarke, Karla Hoff, Hanan Jacoby, and Kenneth Sokoloff for useful discussions. We thank Avner Ahituv and David Coady for detailed comments, and David Coady for editorial assistance. Please send comments to L. Colin Xu at: LXU1@worldbank.org.

1. INTRODUCTION

Marriage timing has significant implications on people's welfare: for example, through labor supply and human capital investment of women (Foster and Rosenzweig, 2000), fertility decisions and the incidence of out-of-wedlock births (Akerlof, 1998), and not to mention the direct benefits arising from the production of children, intimacy and companionship, and other aspects related to economies of scale in consumption and household production (Becker, 1991). There has been a large body of research on marriage timing, including earlier ones focusing on women (Chelin 1980, Anderson, Hill and Bulter 1987, Goldscheider and Waite 1986, Lichter et al. 1992, Mare and Winship 1991, Teachman, Polonko, and Leigh 1987), and later ones concerned about men (Oppenheimer, Kalmijn, and Lim 1997).¹

Three explanations can be advanced for the understanding of marriage timing. First, "the independence hypothesis" argues that rising economic independence of women and therefore the decreasing extent of specialization between men and women reduces the gains of marriage and therefore the incentives for marriage for women to get married. Second, "the career cycle hypothesis" uses the perspectives of search theory to explain the delayed marriage of both men and women, and emphasizes the rising difficulty of school-to-work transition, and the difficulty to coordinate two careers (Oppenheimer 1994, 1995, and 1997; Oppenheimer, Kalmijn, and Lim 1997). Third, differences in marriage timing may be due to structural aspects of marriage market such as search efficiency. For instance, rural marriage markets are characterized by greater search costs than urban markets. Different areas might have various levels of penetration of social (and political) organizations for young people that facilitates the search for mates.

The evidence is mixed about the plausibility of the independence versus the career cycle hypotheses. The evidence for the independence hypothesis appears to be weak (Oppenheimer, Kalmijn, and Lim 1997). For instance, the independence of women should rise with schooling, yet a better education is shown by micro evidence to have no systematic relationship with the propensity to marry (Anderson, Hill, and Butler 1987). Moreover, women's employment and earnings in general do not have the predicted negative effects on marriage formation (Cherlin 1980; Goldscheider and Waite 1986; Lichter et al. 1992; Mare and Winship 1991; Oppenheimer, Blossfeld, and Wackerow 1995; Oppenheimer and Lew 1995; Teachman,

¹The early focus on women was due to the relationship between marriage timing and population growth, which might have serious implications on economic growth. The research on the timing of marriage time of men has picked pace due to the increasing inequality in the 1980s and 1990s in the U.S. (Bound and Freeman 1992; Juhn, Murphy, and Pierce 1993; Welch 1990), which likely caused poor marriage prospects of young men.

Polonko, and Leigh 1987). Yet there is evidence for the “career cycle hypothesis”. Indeed, in a series of papers, Oppenheimer and her colleagues present arguments and evidence in favor of this view (see the earlier citation). For instance, Oppenheimer, Kalmijn, and Lim (1997) examines the marriage timing of men, and find that the pace of marriage formation depend on the difficulty of career transition. Little empirical evidence is found on the third hypothesis (by the authors).

This paper uses a non-traditional data (i.e., China versus the typical U.S. data) to examine the timing of marriage of young Chinese around 1991. An important objective is to make another attempt to examine the validity of the three explanations for marriage timing. In particular, our paper differs from earlier attempts in several ways. First, we shall examine both the timings of marriage for both men and women using the same data. Second, since the urban and the rural residents differ significantly in their economic opportunities, career complexity, and regional growth, we also look at the timing issue separately for the urban and rural residents. Third, the ample variations among the Chinese provinces in growth allow us to examine how growth affects the marriage timing of young people. Fourth, while the search perspective of marriage timing emphasizes the importance of search efficiency, there is a lack of empirical literature that bears on the issue of how search efficiency affects marriage timing. We shall aim to address this issue by looking at how marriage timing is affected by the membership in the Communist Youth League, the most important social (and political) organization in terms of membership for young Chinese people. This attempt also echoes the call of Fricke, Syed, and Smith (1986) for paying attention to the social construct in which marriage market works.

The data set, consisting of roughly half a dozen provinces (plus a municipality) in China, has several advantages. It covers both rural and city residents, thus allowing us to contrast the spatial differences in marriage timing. More importantly, it contains detailed information on personal characteristics, such as age, schooling, and network or political affiliations (with the Communist Youth League). Exploiting these variations, we find that the tendency to be married has little to do with the educational similarity among the sexes in the local marriage market. While schooling delays marriage, the affiliation with the Communist Youth League (CYL) appears to increase marriage incidence of young men and women; this is consistent with the search perspective that the reduction of search costs would raise the propensity to marry. Higher wage is associated with lower likelihood of marriage for young people in the cities, but not in the countryside. This piece of evidence favors the career cycle hypothesis: the independence hypothesis should imply a lower tendency to get married in cities and in the countryside, so the finding in the countryside is inconsistent with the hypothesis. Yet since higher wage is likely to associated with a more difficult

career transition in the cities (but not in the countryside) due to issues such as the location problem and the more complex nature of jobs in the cities, the finding is consistent with the career cycle perspective. Finally, young people living in high growth region-year are less likely to delay their marriage.

In the rest of the paper, we first provide a theoretical discussion on the determinants of marriage decisions (Section II). We then introduce the data and discuss measurements (Section III). We present empirical results in Section IV, and conclude in Section V.

2. THE TIMING OF MARRIAGE: A CONCEPTUAL FRAMEWORK

Following the seminal papers on marriage by Becker (1973, 1974), one of the earliest applications in Freiden (1974), and the use of search paradigm in the marriage market (Keely 1977; Oppenheimer, 1987; Oppenheimer, Kalmijn, and Lim 1997), we use a similar framework to analyze the determinants of timing of marriage, paying particular attention to the differences in behavior between men and women, rural and urban residents.

A person can choose two modes of production: To stay single and produce wellness (i.e., the Z-good in Becker's terminology) under autarky; or, to establish a joint venture with a partner (i.e., marriage). The most important reason for joint production is of course the need to have children, which is more efficiently produced under joint production. Besides, joint production entails economy of scale in some aspects, such as cooking, intimacy and companionship, entertainment, and durable consumption. Equally importantly, joint production allow specialization in separate domains, for instance, the one with higher earning power to specialize in market production, while the one with comparative advantage in home production in housework. The gains from marriage are balanced with costs of joint production, which include ex ante costs and ex post costs. Ex ante costs include the search costs in the marriage market, such as the actual expenses, and the opportunity costs in forgone income and other activities.² They also include purchases signalling credible commitment such as engagement ring, psychological costs of adapting one's routines to accommodate the other. Ex post costs include coordination costs for joint activities and division of labor, domestic conflicts, and income reduction when one party turns out to be unable to compensate sufficiently to warrant the other party's inputs for the household production. Since the gains and costs from marriage depend on the actual partner, ex ante the party seeking a

²This does not mean that everything associated with searching is just costs. Some activities such as dating could have generated enjoyment.

mate has to judge the potential net gains from marriage at each period. When the expected gains in period t from marriage exceeds a reservation level (“reservation satisfaction”), he or she would decide to get married at period t (Oppenheimer 1988). Our goal here is to determine what explains the timing of marriage decisions.

The extent of search will depend on the marginal benefits and costs of search.³ The agent will stop search when marginal benefits of search equate marginal costs of search. The length of search increases with its marginal benefits, and decreases with its marginal costs. This immediately leads to one implication: Young people being affiliated with the Communist Youth League (CYL) is likely to marry earlier than those without such affiliation. The CYL is the single most important network for young Chinese, and its local-branch leaders often organize various types of social gathering among the young (besides the official role designated by the government). The access to a large network of potential mates reduces the information costs associated with searching mates. Lowering marginal costs curve would lead to an earlier marriage. Moreover, since information costs are higher in the countryside because people live further apart, the access to a network represents a larger extent of information economy in the countryside than in the cities. We thus expect that access to the CYL network raises the likelihood of marriage for young people of city and countryside alike, and especially for the rural.

The approach also leads to an important result that is emphasized in the search literature of marriage market (Oppenheimer, 1988): A complex job career is likely to lead to a later marriage. The reason is as follows. For an agent with a complex career—for instance, a career that requires formal and informal training, with larger uncertainty about job location and about schedule of overtime work—it is more difficult to find a mate that can adapt to the complexity of his or her work and personal life. Thus the gains from search tend to be large before the uncertainty is reasonably resolved. For instance, the partner may not like to re-locate, to see the other travel too much, to see the expected wage potential not realized. Further search while waiting the uncertainty to unravel would reduce such costly errors, and increase the net expected gains from future marriage. Moreover, the unfolding of uncertainty would result in a better price in the marriage market because of the positive externality on potential mates. In light of these considerations, the marginal benefits of searching for agents with complex careers tend to be high in the early adulthood. Since the search costs for agents with different degree of job uncertainty tend to be similar or are at least less important than the differences in search benefits,

³See Ehrenberg and Smith (1982), Stigler (1962), and Lippman and McCall (1976) for discussions of job-search theory.

we expect young people with more complex careers and higher uncertainty to marry later.

Macro factors might also affect marriage timing of young people. When a region features high growth rate, the wage of both men and women likely increase relatively proportionately. This increase the relative productivity in the market sector relative to the household sector, and pull young people of both genders toward more labor market involvement. For one thing, it may mean that the school-to-work transition for young people would be more complex due to the increase in the uncertainty about the young person's future prospects, job type and location. Facing such uncertainty, both the person with high uncertainty and his or her potential mates have incentives to wait before committing to marriage. This likely would delay marriage. For another thing, high growth might lead to higher labor market participation of women, which leads to lower gains from marriage (Becker, 1991), and as before, raises the uncertainty about the woman's slot in life. This again delays marriage. *We thus expect the young people living in high growth province-years to be less likely to get married.*

How does individual *wage* affect his or her marriage age? A higher wage level for a person is likely to increase the marriage age for young people in the city, both for men and women; the implications for young people in the countryside is different. First, higher wage job is associated with greater uncertainty about the career—especially in the cities—at the young stage. As discussed earlier, the high-wage young person has incentives to wait until the career reaches a more or less settled stage; a later marriage likely leads to a better match of the mate with his or her job, location, and other traits. Moreover, the potential mate also has incentives to wait for the dust to settle before pursuing the mate. Thus it is likely that high-wage young people, especially city dwellers, are less likely to get married early. The story about rural young people is different because there is much less uncertainty about career choice, job location, and so on. So we expect little effects of wage levels on the likelihood of marriage in the countryside.

How does *education* affect marriage gains and therefore marriage likelihood? Education of an individual affects the gains of marriage in two ways. First, since schooling benefits both partners in a marriage while only himself or herself when single, there is a tendency for marriage gains to be positive. This is similar to the observation about firms that able executive controls a firm of larger size so as to maximize the benefits of the wisdom of the executive (Rosen 1982). Second, since schooling takes time itself, it delays school-to-work transition. A higher level of school attainment thus increases the uncertainty about the stable job path in the early adulthood. The young person then has stronger incentives to wait longer until he or she can get a good “price” for himself or herself. This likely will increase the age of marriage. Since the first effect hinges on the second effect—the

spillover effect of schooling is likely realized only after the better-educated person is sold (by himself or herself) in the market—we expect the negative effect of education on marriage likelihood to dominate. We thus expect better-educated young person to delay his or her marriage.

Since it is an interesting issue whether male and female schooling are complements in household production, in the regression we shall, besides controlling for individual schooling level, add another term of the absolute value of the differences of the average values of male schooling and female schooling, $|\bar{s}_m - \bar{s}_f|$, in local marriage markets. The idea is that, holding the level of education constant, local marriage markets featuring similar education background of sexes should witness a larger (smaller) gain from marriage if male and female schooling are complementary (substitutes). If we find a negative effect of $|\bar{s}_m - \bar{s}_f|$ on marriage likelihood, then s_m and s_f are likely complements. Another way to see whether schooling inputs are complements in joint production is to see the *actual* schooling differences of couples. However, this difference represents the outcome of the marriage choice, and is thus endogenous to the modeling of the marriage decision.

3. DATA AND MEASUREMENTS

The study of the status of contemporary Chinese women (SSCCW),⁴ the data set we use, was conducted jointly by The Population Institute of Chinese Academy of Social Science and the Population Council of United Nations in 1991. The data set has information on personal traits, marriage characteristics, fertility, work, intra-family arrangements, and gender norms. While most questions are of the nature of cross-sectional, the questionnaire also contains many questions related to life history, such as when a person got married, his or her schooling attainment, fertility history, and so on.

The survey covers one municipality and 6 provinces (Shanghai, Guangdong, Sichuan, Jilin, Shandong, Shaanxi, and Ningxia) for the year of 1991. The sample households were selected with stratified random sampling method. The age of the couples ranges from 15 to 80; but cutting the top and bottom 1 percent of the sample reduces the age range to 22 to 57. The city represents roughly half of the sample (4509 couples), and the countryside the other half (4524 couples).

3.1. Measurements

The variables related to personal characteristics are self-explanatory. CYL is the dummy of being affiliated with the Communist Youth League. $\ln(W)$ is the logarithm of the annual income for an individual at the time of

⁴See Institute of Population Studies (1993) for more details.

interview. While labor participation could be low in many countries, for the young couples in our sample it is quite high, and as a result, the annual income variable is available for the vast majority of our observations. We also have two variables capturing the regional environment. GDP GROWTH is the province-year growth rate for the relevant young person in the marriage market for each year before or at the year of marriage. DISTANCE is the logarithm of one plus the distance of provincial capital to the coast. One is added so as to avoid taking logarithm with respect to zero.

Since we are also interested in how features of marriage market affect marriage timing, we need to have an empirical definition of marriage market in our context. We define a marriage market to be an urban or rural area for a county or a city. That is, a rural (city) marriage market consists of all the young rural (city) residents in a county (city). Since the average age differences of male and female upon marriage is two years (based on our data and consistent with our personal observations), we consider young men of 17 to 30, and women of 15 to 28 as being in the marriage market.⁵ We only consider the marriage decisions of young people between these age ranges because more than 95% of all marriage occur in these ranges.

We segregate rural and urban residents to separate marriage markets because rural and city residents rarely marry each other in China. The reasons include the difficulties of rural residents to get official urban registration (due to the so-called “Hukou” system), which would allow them to enjoy subsidies in food, housing, schooling, and medical care; the much lower income;⁶ cultural differences; and most of all, little social interactions between urban and rural residents.

Although limiting the extent of the market to county or city is somewhat arbitrary, we believe it is not too improper: It contains a large number of young people; it is not very difficult to get into contact with other people in the same county or city; we have also experimented with using a lower administrative level such as township or street as the boundary of the marriage market,⁷ and obtained qualitatively similar results. Based on this definition of marriage market, we create the differences in the mean levels of schooling of men and women in the local marriage market.

4. EMPIRICAL RESULTS

4.1. Age distribution of marriage

Almost all marriages occur between 16 to 30 years old (Figure 1). Among the young people in our age range, 58% of them are married. In fact, most

⁵It is important to know that in the case of Shanghai, “city” refers to district.

⁶The rural-urban earning income differential has been quite large, partly because of the migration constraints.

⁷Township (street) is an administrative level just below county (city).

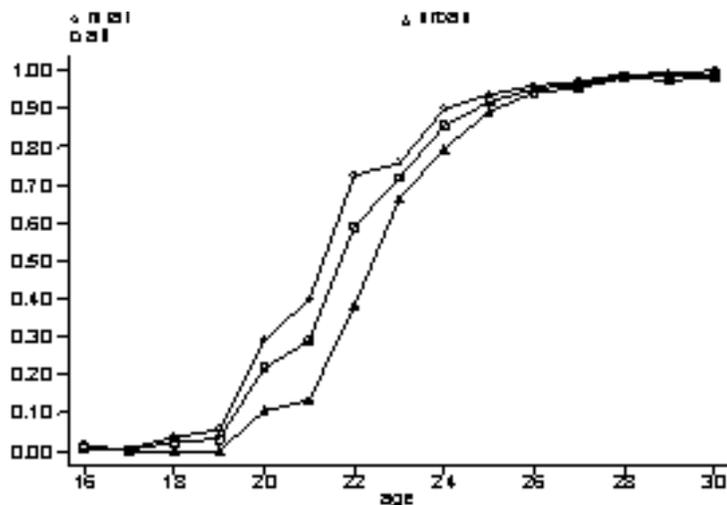


FIG. 1. The age distribution of marriage: Rural vs. Urban

of the marriages happen between 19 and 25 years old, and this is true both in the city and in the countryside. Young people in the countryside apparently get married significantly earlier—the cumulative distribution of rural young people lies above that of the urban young people.

4.2. Marriage markets and marriage decisions

We now examine the marriage decisions of young people with the framework of section II. Since the probability of marriage depend on age, a useful empirical framework is survival model (Anderson, Hill, and Butler 1987). In particular, the probability of getting married for young people likely increases over time. We thus choose the popular survival model of Weibull distribution, which allows the possibility of duration dependence, that is, the likelihood of getting married increasing or decreasing over time. In particular, the hazard rate—the likelihood of getting married immediately after age t given that he or she is single at the age t —is assumed to be as follows:

$$h(t) = pt^{p-1}e^{\beta_0 + \beta_1 X_1 + \dots + \beta_k X_k} \quad (1)$$

where h is the hazard rate at age t , p is the parameter capturing duration dependence. In particular, when p is greater than 1, the hazard rate exhibits positive duration dependence. In other words, the likelihood of getting married in year t increase as t rises. When p is smaller than 1, there is negative duration dependence. When p is 1, the hazard rate re-

main constant at different ages. The variables X_i represent those underlying marriage gains. A positive (negative) β_i then implies that X_i increases (reduces) the hazard rate of marriage. The explanatory variables include personal characteristics (CYL, school, $\ln(W_i)$), schooling disparity in the marriage market ($\log(|S_m - S_f|)$), regional growth, and the distance of the province to the coast. The last variable is included to allow for the fact that the inland provinces might differ significantly from the coast area; the coastal areas might be more exposed to Western culture and have a better access to FDI, for instance.

Our sample consists of young married couples, with the age of men ranging from 17 to 30, and that of women from 15 to 28. Using the cross section data, we form a duration sample in the following way. (i) For each person, we form a duration panel with each person having one observation for each year between the initial age (17 for men and 15 for women) and the age of getting married. (ii) We drop those observations prior to year 1987. The reason is that some variables such as CYL and wage would change over time during a person's lifetime. Since we do not have time-varying information, we have to proxy these variables with observations in 1991. While this certainly would introduce measurement errors, we do not think that the qualitative results would change had we been able to have time-varying observations for these two variables. After all, CYL status is likely an affiliation acquired during high school and slightly beyond, and high wages in year 1991 is also likely associated with high wages for the previous years. We do include, however, two true time-varying variables (the age and the province-year growth rate). The growth rates are drawn from various issues of the Chinese Statistics Yearbooks. Note that while age is not an explanatory variable of the duration, the results related to age are summarized by the p parameter.

Table 1 presents the summary statistics of our main variables by residence and gender. Note that we have 405 men, and 572 women, for each of the rural or urban sub-samples.⁸ The level of schooling was higher for the men than for the women. The incidence of CYL among the young men and women were quite high, around 40 to 60 percent for the urban men and women, respectively.

The results of determinants of marriage decisions are presented in Table 2. The results on women for the urban and rural subsamples are reported in columns 2 and 3. And the corresponding results on men are reported in columns 4 and 5. For all the four sub-samples the Weibull distributions exhibit positive duration dependence. All the p estimates are significant

⁸That is roughly 11 percent of the couple samples. Note that although the percentage is small, it is entirely due to the requirement of selecting young people within a certain age range, and of having the marriage date within some years of 1991 so that the information in 1991 remain good proxies for slightly earlier years.

and much larger than one, suggesting that the likelihood of getting married increases as both men and women get older, and this is true regardless it is in the city or in the countryside.

TABLE 1.

Summary Statistics of Used Variables

Variable name	definition	mean (standard deviation)			
		Rural women	Rural men	Urban women	Urban men
Number of persons		572	405	572	405
Age		20.3 (2.12)	21.4 (2.3)	22.3 (2.0)	23.7 (2.0)
Ln(W_i)	The logarithm of annual income. The income figure is in Yuan.	6.590 (0.910)	7.253 (0.707)	7.569 (0.359)	9.997 (0.366)
$\log(S_m - S_f)$	The logarithm of the absolute value of the differences of average schoolings of men and women in a marriage market.	0.087 (1.151)	0.094 (1.170)	-0.303 (0.812)	-0.337 (0.948)
School	The level of school of a young person (between age 17 and 30).	6.40 (3.15)	7.56 (0.36)	7.57 (0.36)	11.36 (2.78)
CYL	A dummy variable indicating the affiliation with the Communist Youth League	0.178 (0.383)	0.216 (0.412)	0.622 (0.485)	0.422 (0.494)
GDP growth rate	The province-year real GDP growth rate, in percentage points.	7.56 (5.15)	7.46 (5.07)	8.17 (5.27)	9.17 (5.90)
Distance	The logarithm of one plus the distance of a province's capital to the nearest port by railroad.	0.995 (0.597)	0.988 (0.602)	0.911 (0.515)	0.673 (0.414)

Note. The two numbers reported for each variable are its mean and its standard deviation.

The results suggest that young people of higher wages in the cities are less likely to get married. This is not true for the rural residents. Our findings are consistent with our earlier discussion: higher wages in the city are associated with greater uncertainty, and a good match likely require longer search, and such concerns in the countryside are much less relevant and there should be no relationship between wage and the marriage likelihood in the countryside. Increasing log wage by 0.50 would reduce the marriage hazard rate by roughly 23% for the urban young people.⁹

⁹To see this, $h(\ln W + 0.5) / h(\ln W) = e^{-0.52 \times 0.5} \approx 0.77$.

TABLE 2.

Determinants of marriage decisions: men and women

	Women		Men	
	Urban	Rural	Urban	Rural
$\ln(W_i)$	-0.518	-0.041	-0.483	0.097
	(3.40)***	(0.83)	(3.37)***	(1.48)
GROWTH RATE	-0.026	-0.043	-0.025	-0.044
	(2.65)***	(5.09)***	(2.50)**	(5.24)***
CYL	0.178	0.257	0.173	0.313
	(1.87)*	(2.13)**	(1.60)	(2.80)***
SCHOOL	-0.068	-0.054	-0.038	-0.063
	(3.78)***	(3.69)***	(1.82)*	(3.61)***
$\log(S_m - S_f)$	-0.081	0.025	-0.033	0.042
	(1.47)	(0.68)	(0.57)	(1.10)
DISTANCE	-0.344	0.172	0.278	0.016
	(1.84)*	(1.36)	(1.18)	(0.13)
Constant	-8.920	-7.576	-6.778	-5.996
	(7.28)***	(16.60)***	(4.48)***	(11.16)***
Observations	1358	1426	1038	1455
p	6.028***	4.037***	5.412***	3.105***
	(0.210)	(0.131)	(0.214)	(0.103)

Note. *, **, *** represent statistical significance at the level of 10%, 5%, and 1%. In parentheses are t-statistics.

Our earlier discussion suggests that young people in high growth areas are more likely to stay single in order to take advantage of the better opportunities in the market sector (relative to household production). This is confirmed by our findings. The hazard rate of marriage declines significantly with the growth rate. An increase of GDP growth rate by 5 percentage points would reduce the marriage hazard rate by 12% for urban women, 19% for rural women, 12% for urban men, and 20% for rural men.

As expected, the access to networks significantly increases the chance of marriage. The CYL dummy is either statistically significant or nearly so for all the four sub-samples. Relative to an otherwise identical person without being a CYL member, a person with such an affiliation has a hazard rate of marriage that is higher by 20 to 26 percent. Note that the positive effects on marriage hazard are significantly higher in the countryside, consistent with our discussion that the importance of reducing searching costs is much more important in the countryside than in the city.

Our previous discussions suggest that schooling is likely to delay the likelihood of marriage. This is confirmed by our findings. The school-

ing variable is statistically significant in all the four sub-samples, with the slightly stronger effects observed for urban women. An increase of schooling by 2 years would reduce the hazard rate of marriage by 13% for urban women, 10% for rural women, 7% for urban men, and 12% for rural men. While it has been conjectured about the complementarity of schooling between men and women for household production, we do not find favorable evidence. If there is a strong complementarity between male and female schooling for household production, we would expect young people to get married earlier in marriage market in which male and female schooling are similar. The coefficient of median schooling disparity is insignificant in all of the four sub-samples. Interestingly, while urban women in more remote areas are likely to get married later, the distance variable is insignificant in most of the sub-samples.

Our results are robust if we control for the types of employer (state-owned, collective, foreign-owned, other types of ownership), and ethnic dummies. In addition, the data set also asks *ex ante* (i.e., before the marriage) what were the most important criteria for picking a partner. To some extent this may represent the preference of the young people in finding his or her match. Our results remain robust when we include such indicators of spousal preference.

We have also experimented with using the semi-parametric specification of the duration model (the Cox model). We have obtained qualitatively similar results. Since the estimates of p in the Weibull specification facilitate exposition and interpretation, we have chosen the Weibull specification for our presentation here.

5. CONCLUSIONS

Relying on the framework in Becker (1973, 1974) and the insight that job complexity in early adulthood tends to delay marriage, we derive implications about how personal characteristics, regional growth, and access to network affect marriage decision. We then rely on a unique data set on Chinese households to test these predictions. Overall, the empirical results support our hypotheses, and suggest that job complexity indeed tended to delay marriage.

As we see it, the main contributions of this paper are two. First, this is the first paper on the working of marriage market in modern China with systematic empirical evidence. There have been several studies of marriage in China. For instance, Cheung (1972), perhaps the earliest attempt in analyzing marriage contracts of (traditional) China, attempts to explain important features of marriage contracts of traditional China such as parents' rights in children, blind marriage, "daughter-in-law raised from Children," foot binding, and concubinage. Other studies include Zheng

(1985) and Harrell (1992), but none of them focus on the marriage market aspects. Second, we systematically examine how regional growth, personal wage, schooling, and the access to network affect the timing of marriage. This is the first paper, to our collective knowledge, that empirically analyze the importance of access to network on marriage timing, and systematically show how job complexity tend to slow down marriage timing in a variety of cases (urban vs. rural; men versus women).

REFERENCES

- Akerlof, George A., 1998, Men without children. *Economic Journal* **108**, 287-309.
- Akerlof, G. A., J. L. Yellen, and M. L. Katz, 1996, An analysis of out-of-wedlock childbearing in the United States. *Quarterly Journal of Economics* **111**, 278-317.
- Anderson, Kathryn H., M. Anne Hill, and J.S. Butler, 1987, Age at marriage in Malaysia. *Journal of Development Economics* **26**, 223-234.
- Becker, Gary, 1973, A theory of marriage: Part I. *Journal of Political Economy* **81(4)**, 813-46.
- Becker, Gary, 1974, A theory of marriage: Part II. *Journal of Political Economy* **82(2)**, S11-S26.
- Becker, Gary, 1991, *A Treatise on the Family*, enlarged edition, Cambridge, Mass.: Harvard University Press.
- Bergstrom, Theodore C., 1997, A survey of theories of the family. In: M.R. Rosenzweig and O. Stark eds., *Handbook of Population and Family Economics*. Elsevier Science B.V..
- Blau, Francine D., Lawrence M. Kahn, and Jane Waldfogel, 2000, Understanding young women's marriage decisions: The role of labor and marriage market conditions. *NBER #7510*, January.
- Bound, John and Robert Freeman, 1992, What went wrong? The erosion of relative earnings and employment among young black men in the 1980s. *Quarterly Journal of Economics* **107**, 201-32.
- Cherlin, A., 1980, Postponing marriage: The influence of young women's work expectation. *Journal of Marriage and the Family* **42**, 355-65.
- Cheung, Steven N. S., 1972, The enforcement of property rights in children, and the marriage contract. *Economic Journal* **82**, 641-657.
- Chinese Statistics Bureau. *Chinese Statistics Yearbook*. Various Issues.
- David, Lam, 1988, Marriage markets and assortative mating with household public goods. *Journal of Human Resources* **23(4)**, 462-87.
- David, Lam, 1993, Effects of family backgrounds on earnings and returns to schooling: Evidence from Brazil. *Journal of Political Economy* **101(4)**, 710—740.
- Foster, Andrew D. and Mark R. Rosenzweig, 2000, Missing women, the marriage market, and economic growth. *Working Paper*. University of Pennsylvania, August.
- Freiden, Alan, 1974, The United States marriage market. *Journal of Political Economy* **82(2)**, part 2, S34-S53.
- Fricke, Thomas E., Sabiha H. Syed, and Peter C. Smith, 1986, Rural punjabi social organization and marriage timing strategies in Pakistan. *Demography* **23**, 489-508.

- Keeley, M., 1977, The economics of family formation. *Economic Inquiry* **15**, 238-250.
- Keeley, M., 1979, An analysis of the age pattern of first marriage. *Interview Economic Review* **29**, 527-544.
- Harrell, Stevan, 1992, Aspects of marriage in three southwestern villages. *China Quarterly* **130**, 323-37.
- Hogan, D., 1978, The effects of demographic factors, family background, and job achievement on age at marriage. *Demography* **15**, 161-175.
- June, C., 1992, Decline of male labor market participation: The role of declining market opportunities. *Quarterly Journal of Economics* **107**, 79-121.
- June, C., K. Murphy, and B. Pierce, 1993, Wage inequality and the rise in returns to skill. *Journal of Political Economy* **101**, 410-42.
- Institute of Population Studies, CASS. *Sampling Survey Data of Women's Status in Contemporary China*. Beijing: International Academic Publishers.
- Mare, R. D. and C. Winship, 1991, Socioeconomic change and the decline of marriage for blacks and whites. In: the *Urban Underclass*, edited by C. Jnecks, and P.E. Peterson, pp. 175-202 . Washington, DC: The Brookings Institute.
- Oppenheimer, Valerie K., 1974, The life-cycle squeeze: The interaction of men's occupational and family cycles. *Demography* **11**, 227-45.
- Oppenheimer, Valerie K., 1988, A theory of marriage timing. *American Journal of Sociology* **94**, 563-91.
- Oppenheimer, Valerie K., 1994, Women's rising employment and the future of the family in industrialized societies. *Population and Development Review* **20**, 293-342.
- Oppenheimer, Valerie K., 1997, Women's employment and the gain to marriage: The specialization and trading model. *Annual Review of Sociology* **23**, 431-453.
- Oppenheimer, Valerie K., Matthijs Kalmijn, and Nelson Lim, 1997, Men's career development and marriage timing during a period of rising inequality. *Demography* **34**, 311-330.
- Rosen, Sherwin, 1982, Authority, control, and the distribution of earning. *Bell Journal of Economics* **13(2)**, 311-323.
- Terkel, Studs, 1981, *American Dreams: Lost and Found*. New York: Ballantine Books.
- Weiss, Yoram, 1997, The formation and dissolution of families: Why marry? Who marries whom? And what happens upon divorce? In: M.R. Rosenzweig and O. Stark eds., *Handbook of Population and Family Economics*, chapter 3. Elsevier Science B.V.
- Weiss, Yoram and Robert Willis, 1996, Match quality, new information, and marital dissolution. *Journal of Labor Economics* **15(1)**, S293-329.
- Willis, Robert and Yoram Weiss, 1993, Transfers among divorced couples: Evidence and interpretation. *Journal of Labor Economics* **11(4)**, 629-679.
- Willis, Robert and Yoram Weiss, 1985, Children as collective goods and divorce settlements. *Journal of Labor Economics* **3(3)**, 268-292.
- Zeng, Yi, James W. Vaupel, and Anatoli L. Yashin, 1985, Marriage and fertility in China: A graphical analysis. *Population and Development Review* **11(4)** 721-736.