The Influence of Women's Education On Their First Marriage Age

Kanghui Gong[1, a *], Ke Wu[1,b] and Wei Luo[1,c]

[1]No. 20 Chengzhong Road, Jiading District, Shanghai, China

[a]gongkanghui2017@163.com; [b]ccoco_wu@163.com; [c]lwtotto@gmail.com

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Abstract. Using the IV probit model with instrumental variables and the cross-sectional data of the Chinese General Social Survey (CGSS) in 2013, this paper studies the influence of women's educational level and other personal and family characteristics variables on their divorce tendency. In order to overcome the potential endogenous problems in the model, this paper chooses the mother's education level as an endogenous variable and the female' education level as a tool variable. The empirical results show that the higher the education level of women, the greater the probability of divorce.

Introduction

The stability of marriage is of great importance to society or individuals. From the macro level, it is closely related to human continuity and social stability; from the micro level, it is related to personal happiness, family harmony and the development of future generations. Since the 1970s, the divorce rate in China has continued to rise, which has aroused widespread concern and heated discussion in society and academic area. Due to the popularization of compulsory education, the implementation of the one-child policy, and the strengthening of social education, the status of women in China has been greatly improved, from the traditional idea of "male dominated outside, female dominated inside" to the reality that "women can hold up half the sky". Women's educational level, income and social status have been greatly improved, which also makes women gradually get rid of their dependence on their husbands. Therefore, the change of women's status in China has led to the change of their ideas and choices. It is of great significance to study the factors affecting women's divorce choices in order to study the rapid growth of divorce rate.

There are quite a lot of achievements in the existing literature on women's choice of divorce. Wang Chunxiang et al. (2007) argued that after the improvement of economic status, the divorce cost considered by women in choosing divorce decreased, and divorce became a "substitute" for unhappy marriage. On the other hand, with the development of economy, traditional women gradually get rid of the image of "housewives" and enter the workplace. When both husband and wife are busy working and lack of communication, the possibility of divorce becomes greater. Xu Anqi and Ye Wenzhen (2002) study on Provincial Panel Data in China shows that when men of school age are more than women, women's intentions and possibilities of choosing divorce will increase, mainly because there are more alternative males in the marriage market. The research of Li Ping (2011) shows that the new Marriage Registration Regulation implemented in 2003 simplifies divorce procedures and procedures, reduces the cost of divorce significantly, and has a certain impact on the rise of divorce rate in China.

There are many empirical studies abroad to explore the important variables affecting marital stability, including age at first marriage, education level, marital duration, premarital childbirth and so on. Becker (1977) proposed that marrying at a younger age would result in higher search costs and insufficient awareness of oneself, partners and the marriage market. With the increase of marriage age, the risk of divorce would decrease. Becker also pointed out that the impact of education on the possibility of divorce is not clear. Education reduces the division of labor between spouses, thus reducing the benefits of marriage, but increasing the benefits of the existing division of labor. Other research theories on divorce factors include "family structure theory", "the influence of marriage concept", "marriage gradient theory", "the hypothesis of women's economic independence" and "the

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influence of women's economic ability on marriage decision-making" based on Becker's marriage economics. These theories have different views and have many similarities and differences.

The existing literature has used provincial and village-level micro-data to study, and there are many macro-level data of "divorce rate" as dependent variables to study from the macro-level. Many scholars regard economic development, trade openness, social insurance and some legal factors as the main variables to study the topic of divorce, but seldom consider the influence of women's personal characteristics, such as education level, on divorce factors from the perspective of "women". Therefore, this paper focuses on the influence of women's educational level on their marital outlook. Previous studies have included educational level in the influencing factors of women' s divorce decision-making, but seldom discussed and dealt with the endogenous nature of educational level, which affects the accuracy of the results.

This paper uses the cross-sectional data of China General Social Survey (CGSS) in 2013 to empirically analyze the impact of women's educational level on their divorce tendency. In the measurement method, IV-probit model is adopted, and the education level of mother is used as a tool variable to overcome the endogenous problem.

The following structure is arranged as follows: the second part is model setting, the third part is descriptive statistics of data, the fourth part presents empirical results and analysis, and the fifth part summarizes the full text and discusses policy implications.

Model Setting

General Probit Model.

This paper focuses on the influence of women's educational level on their divorce tendency. We use the data of "current marital status" in CGSS database to process. After deleting unmarried and widowed women, divorce, remarriage and divorced separated status are unified as divorce status, which is recorded as 1.Respondents who were first married were regarded as undivided and recorded as 0.

Because the dependent variable of this study is a dummy variable, the linear probability model estimated by OLS method will have a prediction value greater than or less than 0, so LPM is only used as a rough reference. For this reason, this paper uses the probit model widely used in literature to estimate. Probit model makes the predicted value of Y always between [0,1].The model is set as follows:

$$y_i = \beta a7a + \gamma X_i + \varepsilon_i \qquad (1)$$

Among them, y is the explanatory variable, i.e. divorce or not. It is a virtual variable. When the respondent divorces or is in the state of divorce and separation, y is defined as 1. When the respondent is in the state of first marriage and not divorced, y is defined as 0.X includes control variables that reflect a range of personal and family characteristics. Detailed descriptions of these variables are shown in Table 1.F(.) is the cumulative distribution function of standard normal.

Endogenous Nature of the Model.

We can note that the divorce tendency of married women and their educational level may be causal, which may lead to endogenous problems in the above model setting. Specifically, a woman's educational level may affect her decision to divorce, which is also the cause and effect of this paper. However, women with more independent attitudes tend to choose to receive more education because they tend to get more security from themselves than from marriage, so the more likely they are to get divorced, the more likely they are to be educated. For example, the less educated women are, the more dependent they are on marriage, the less able they are to face the cost of living alone, and thus the less likely they are to divorce. Of course, it is also possible that the less educated women are more likely to hope to change their life through their marriage partners, so when they find that the current marriage can not bring them what they want, they are more likely to divorce to find the next relationship. Therefore, we can not accurately infer the impact of women's educational level on their divorce choices.

Selection of Tool Variables.

In order to solve the problem of endogeneity, this paper intends to introduce a tool variable into the ordinary probit model, using the educational level of the mother as a tool variable. Many literature studies have concluded that the educational level of mothers, especially girls'mothers, has a great impact on their own educational level, while the educational level of mothers has a limited impact on their children's divorce decisions. Of course, it is not excluded that the education level of the mother affects her concept, and then affects the decision of divorce of her children. However, after a series of thinking and experiments, the author finally decided to use the mother's educational level as a tool variable. We believe that this instrumental variable is positively correlated with the educational level of the respondents.

Table 1 Description of model variables

Variable type	Variable name	describe
Interpreted variables	Divorce or not	"Respondents divorced" = 1 "Initial marriage without divorce" = 0
Endogenous explanatory variable	Educational attainment (a7a)	SETTING: The grade of primary school is 3 years.Junior high school level is 4 years, senior high school level is 4 years. 6 Such as year
Exogenous Explanatory Variable	Family population (a63)	There are several people in the family at present.
	Family economic status (a64)	It is divided into five grades, marked as 1 far below the average level, 2 below the average level, 3 above the average level, 4 above the average level, and 5 far above the average level.
	Respondent perception (a421)	Whether to agree with the concept of "men's career is the most important, women's family is the most important", from totally disagree to totally agree with a total of five files, recorded as 1-5 points.
	Age 1	The difference between the year of first marriage and the year of birth
Instrumental variables	Mother's Education Level (a90b)	SETTING: The grade of primary school is 3 years.Junior high school level is 4 years, senior high school level is 4 years. 6 Such as year

Data sources are CGSS

Two-step Estimation of IV-probit Model.

This paper uses the two-step method introduced by Chen Qiang (2014) to estimate the parameters. In the first stage, the endogenous explanatory variable a7a is probit regression for all instrumental variables and exogenous explanatory variables, and the fitting value and residual value of latent variable a7a* are obtained.

$$a7a^* = \delta z_i + \theta x_i + \mu_i \qquad (2)$$

Zi is a tool variable and Xi is an exogenous explanatory variable. The description of the related variables is shown in Table 1.In the second stage, Yi is used to do probit regression for latent variable fitting value, residual value and exogenous explanatory variable.

$$y_i = \beta^* a7a + \gamma x_i + \varepsilon_i \qquad (3)$$

The uniform estimate of beta* can be obtained by two regressions. Because the number of instrumental variables equals the number of endogenous variables, there is no need to test the exogenous nature of instrumental variables.

Descriptive Statistical Analysis

The data used in this paper are from China General Social Survey (CGSS), which is the first national, comprehensive and continuous large-scale social survey project in China. CGSS collects data from different levels of society, community, family and individual systematically, summarizes the trend of social change, explores issues of great scientific and practical significance, promotes the opening and sharing of domestic scientific research, and provides data for international comparative research. The comprehensive social survey in China is carried out by Renmin University of China in conjunction with academic institutions throughout the country. Since 2003, more than 10,000 households across the country have been sampled annually. We will use CGSS 2013 cross-sectional data to analyze the impact of women's educational level on their divorce decision-making.

Table 2 lists the basic statistics of all variables in the measurement model. The mean value of variable div is 0.045, indicating that there is approximately table 2: descriptive statistics of variables.

Table 2 Marginal effect analysis

Variable	Obs	Mean	Std. Dev.	Min	Max
div	3908	.0452917	.2079698	0	1
a7a	3908	4.509468	2.842718	1	13
a63	3908	3.199846	1.350797	1	11
a64	3908	2.701894	.6560748	1	5
a421	3908	3.41607	1.140217	1	5
agel	3908	22.89816	3.444	15	63
a90b	3908	2.068833	1.662339	1	14

4.5% chose divorce. The average length of education is 4.5 years, indicating that the average level of education of women in the sample is in high school. Variable a63 is how many people live together in the family at present. Its average value is 3.2, which is in line with the fact that there are more only children in China and a large proportion of three families. The average value of variable A64 is 2.7, which indicates that the overall household economic situation is slightly lower than the medium level. The average value of variable a421 is 3.41, which shows that a considerable number of women are conservative and agree with the traditional idea that men's career is the most important, women's family is the most important".Ag1, the mean age of first marriage, is 22.9 years old, which indicates that women generally marry around 23 years old.

Measurement Results and Analysis

Estimation Results of IV Probit Model.

Table 3 gives the regression results of the IV probit model in one stage. The results of one stage regression are probit regression of endogenous explanatory variables, that is, education level (a7a) and exogenous explanatory variables and instrumental variables. The results of one-stage regression report the relationship between education level and other variables. The estimated coefficients of all variables were significantly less than 5%, indicating that there was a correlation between education level and other variables. Among them, the parameters of mothers' education level (a90b) were significantly positive, indicating that the explanatory power of mothers' education level was strong, and there was a positive correlation between mothers' education level and daughters'; education level. The parameter of concept variable "whether to agree that men take career as the most important factor

and women take family as the most important factor" (a421) is significantly negative, indicating that conservative traditional male chauvinism has a negative impact on a woman's educational level. This is reasonable, because women who are more inclined to male chauvinism are more likely to have the idea that "female genius is virtue", which tends to reduce education, raise their own costs and rely more on their husbands. Because the coefficients of instrumental variables are significantly positive, there is no problem of weak instrumental variables.

Table 4 reports the two-stage regression results of the IV probit model. For convenience, we also report the estimated results of the general probit model for comparison. In the estimation of IV probit model, the results of Walder test for exogenous primitive hypothesis "H0:p=0" are reported. Its p value is 0.0208, so a7a can be considered as an endogenous variable at 5% level. From Table 4, we can see that the estimation results of IV probit and probit are quite different. The probit model estimates the a7a parameter negatively, while the IVprobit estimates the a7a parameter negatively, but neither of them is significant enough. Probit model estimates the p value of variable a7a to be 0.388. IV probit estimates the p value of a7a to be 0.113.However, it can be seen that probit model underestimates the positive impact of women's educational level on their divorce tendency due to the existence of endogeneity.

At the same time, we find that the coefficients of family population (a63), family economic status (a64), ideas (a421) and age of first marriage are significantly negative, which indicates that the better the economic situation, the less likely it is to divorce. It may be that the cost of division of family property makes the cost of divorce high and reduces the tendency of divorce; the more conservative the ideas, the more inclined to be made by patriarchal social ideology. At the same time, we found that the older the first marriage age, the lower the probability of divorce, which is in line with Becker's conclusion that marrying at a younger age, will have greater search costs and lack of awareness of themselves, partners and the marriage market. With the increase of marriage age, the risk of divorce will decrease. Another reason may be that the older the age, the higher the cost of remarriage; we can also see that the larger the family population, the smaller the probability of divorce. The influence of the number of households on divorce can be seen from two aspects. Firstly, the more old people and children in the family, the more consideration they have, the more difficult it is to divorce out of their sense of responsibility to their relatives. Secondly, the more other family members such as the elderly, the more friction in family life, which reduces marital well-being, and is more likely to lead to divorce. We can see here that the first case seems to have a greater impact.

Table 3 IV Probit Model One-stage Regression Results

A7a	coefficient	standard deviation	T	P>|t|
A90b	0.736848	0.022736	32.41	0
A421	-0.43143	0.03246	-13.29	0
A64	0.525257	0.056044	0.056044	0
A63	-0.06531	0.027034	-2.42	0.016

Table 4 IVprobit two-stage regression results

Variable	Ivptobit	Probit
A7a	0.04508075	-0.01185033
A421	- 0.08048653**	- 0.11500 787***
A63	- 0.21813626***	- 0.21889295***
A64	-0.23568586	- 0.19307149***
Age1	-0.02249028	-0.00849459

Note: ***,*** are significant at 1%, 5% and 10% levels, respectively.

The influence of education level on women's divorce decision-making in literature is usually divided into three aspects. The first way is that education increases women's human capital, decreases their dependence on partners and relies on themselves more confidently and confidently. When their marital life is unsatisfactory, they are more likely to choose divorce. The second way is that education reduces the division of labor between spouses, thus reducing their marital income and more likely to result in divorce. The third aspect is that educated women are more cautious in making decisions, more likely to find suitable partners, and better at maintaining marriage, and less likely to divorce. We can see that the parameter of education degree variable is positive, indicating that the higher education level, the more likely women are to divorce, but the p value is equal to 0.113, which is not very significant, indicating that the third aspect of the impact of education level also has a certain role. Generally speaking, women's educational level has a positive impact on the probability of divorce.

Analysis of Marginal Effect.

Because the meaning of probit model parameters is not intuitive, the results in Table 4 can only give limited information in saliency and parameter symbols. Therefore, we further calculated the marginal effect of each explanatory variable on the divorce probability of women. We calculate how the unit change of each explanatory variable affects the probability of taking each value of the explanatory variable when all explanatory variables are at the mean.

$$\frac{\partial prob(y=i/x)}{\partial x}|(\mathrm{xi}=\mathrm{x}*)(\mathrm{i}=1,2,3,4,5) \qquad (4)$$

Conclusion

Table 5 Marginal effect analysis

	Delta-method dy/dx	Std. Err.	z	P>|z|	[95% Conf.	Interval]
a7a	.0450807	.0284555	1.58	0.113	-.010691	.1008524
a421	-.0804865	.0357745	-2.25	0.024	-.1506033	-.0103697
a63	-.2181363	.0322565	-6.76	0.000	-.2813578	-.1549147
a64	-.2356859	.0583967	-4.04	0.000	-.3501412	-.1212305
age1	-.0224903	.0122605	-1.83	0.067	-.0465204	.0015398

In this paper, instrumental variables are introduced into the general probit model to solve the endogenous problem, and the effects of women's educational level and other variables of personal and family characteristics on their divorce tendency are tested, and the marginal effects are analyzed. The results show that the higher the educational level of women, the greater the probability of divorce, but the coefficient is not significant. This confirms that, on the whole, the higher the educational level of women, the higher their social status, which makes them more inclined to leave when their marital life is in trouble. At the same time, the older the first marriage age of women, the smaller the possibility of divorce, and the smaller the probability of divorce for women with better family economic situation.

According to the previous research results and the empirical results of this paper, we believe that women's educational level has a positive impact on the probability of divorce for two reasons. On the one hand, education increases women's human capital, decreases their dependence on partners, and makes them more confident and self-reliant. When they are not satisfied with their marriage life, they tend to choose divorce. On the other hand, education will reduce the division of labor between spouses, thus reducing the income of marriage, leading to an increase in the probability of divorce. The empirical results confirm Becker's theory that marrying at a younger age has a higher search cost

and insufficient knowledge of themselves, partners and the marriage market. With the increase of marriage age, the risk of divorce decreases. The more women's family concept is, the less likely they will divorce, which is in line with the common phenomenon in life.

References

[1] Lin Guanjuan, Zhao Yaohui: Economics (Quarterly), Vol.14（2015）No.1 p.135-158

[2] Lian Yujun, Li Wensu, Huang Bihong: Economics (Quarterly), Vol.14（2015）No.1 p.185-202.

[3] Lu Jiankun, Fan Liangcong: Luo Weidong: Population Research, Vol.39(2015) No. 2. p. 67-77.

[4] Fan Hongzhong, Li Mingliang.: Population Science of China, Vol.5(2015) No 94 p. 103-128.

[5] Yuan Wei: Statistics and Decision-making,Vol.34(2018) No.6 p. 5-20

[6] Kang Nannan, Wang Erda: Statistical Study,Vol.34(2017) No.5 p. 82-93.

[7]Li Jianxin, Wang Xiaolong: Social Science, Vol.3 (2014) No.1 p. 80-88.

[8] Guo Yongchang, Ding Jinhong: Southern Population: Vol.29(2014) No.4p. 1-9.