Impact of One-Child Policy on Inter-ethnic Marriage in China

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Abstract: This paper examines the impact of the One-Child Policy and the inter-ethnic marriage increase of recent decades in China. Because One-Child Policy restricts the number of children born mainly in the majority couples in particular regions, we hypothesize that it motivates the incentive of Han-ethnic people in affected regions to marry the minority to give birth to more children. Using the regional and temporal variations in policy enforcement, this paper provides evidence for the hypothesis and estimates that one fourth of the increase in inter-ethnic marriage is contributed by the policy. It also finds the inter-ethnic couples under more restrict One-Child Policy include more people with lower education, higher children demand *ex anti*, and more children born *ex post*. Finally, the results show that the policy-caused inter-ethnic couples are more likely to have poorer living conditions and lower-skilled occupations.

Keywords: One-Child Policy; Intermarriage; Fertility; China

Part 1: Introduction

Behavioral response to certain public policies is one of the focuses in economic literatures because it is directly relevant to social welfare consequences (Hendren, 2013). However, most of the literatures only look into the direct and obvious behavioral responses to the incentives changed by the policy but leave little attention on the unexpected or indirect behaviors. With the side effects of policy being ignored, as a consequence, the relevant welfare analysis will be inaccurate and biased. Due to such ignorance, some existing studies may also suffer from unexpected problems (Huang, *et al*, 2014) and the corresponding results have to be re-estimated or re-interpreted. Therefore, the importance of studying in unanticipated behavioral responses to distorted incentives by relevant policies lies in not only policy evaluation but also academic research.

This paper studies the relationship between one-child policy and inter-ethnic marriage in China. We argue that this surprising consequence is mainly due to the distorted incentives brought by OCP because one child policy imposes stronger restrictions on Han than on minority groups. Although the causes and the consequences of interethnic marriage have been long discussed by popular media, policy makers and

academic researchers since 1940s (Davis, 1941; Merton, 1941), few focus on China and none links the interethnic marriage to family planning policies.

This paper studies the relationship between one-child policy and inter-ethnic marriage in China, and finds that the one-child policy contributes to one-fourth of increase in inter-ethnic marriage in last two decades. In China, the provincial governments are authorized to design and implement specific policies according to their local conditions. In general, the minorities are treated more preferentially than Han due to considerations on ethnic harmony. In more than one third of provinces, couples containing at least one minority member usually are permitted to have one or two more children. From an economic perspective, such a preferential policy for couples containing at least one minority can be regarded as a "birth quota", which is only allocated to minority member. This quota is only valuable to Han people whose optimal children quantities are larger than government permits them to have. And, it is nontransferable and can only be shared through marriage. Thus, the implantation of OCP had exogenously changed the payoff structure of marriage market. When demand is sufficiently large, the value of the birth quota would at most equal the fine for violating one child policy. In other words, as government raises the fine for violating OCP, the value of the "birth quota" would increases and minority people would be more valuable in marriage market. The fine rate, which is the measure of OCP toughness in our study, is different across regions across time. And, as discussed before, only about one-third of population in China live in regions with preferential fertility policy for mixed couples. All those variations provide us a unique opportunity of natural experiment to study the causal effects of OCP on intermarriage and related consequences.

In this paper, we focus on the impact of one child policy on the matching in China's marriage market. Taking the advantage of the timing and geographical variation of policy violation fines, this paper investigates how OCP shifted the equilibrium of marriage market in China. We find that, no matter in rural or urban areas, the likelihood of intermarriage is increasing in policy violation fine. Furthermore, regions where mixed couples enjoy preferential fertility policies mainly contribute such effects. The estimates also suggest that OCP accounts for up to 20 percent of the increase in intermarriage since 1980s.

We further investigate the characteristics of individuals involved in intermarriages. As discussed before, this quota is useless for matching a better quality spouse within minority groups because other minority members are endowed with it already. Then after the implementation of such preferential policies, what kinds of minority people, educated or less educated, are more likely to sell their quotas to Han through marriage? The theoretical prediction of answer is not clear. According to assimilation

hypothesis (Meng and Gregory, 2005), a Han spouse is beneficial for a minority to get integrated into the mainstream fast. Through intermarriage, the minority can acquire language skills, knowledge of customs and social connections. On one hand, the highly educated minority are rewarded less from intermarriage because they usually have been assimilated already. Thus, they may have less incentive for intermarriage. On the other, they have more interactions with the Han and thus less searching costs. For Han, the theoretical prediction about who will response to policy changes sensitively is not that ambiguous. An increase in fine rate on violating OCP makes extra birth more monetarily expensive. Then, Han people of lower socio-economic status will find marrying minority is a more affordable approach. Besides, less-educated Hans also have stronger preference of children quantity. It's reasonable to predict that OCP has stronger impact on marriage behaviors of Hans less-educated. Our empirical results find supporting evidence for this prediction. In provinces implementing preferential policies for mixed couples, less educated people, no matter Han or Minority, response more sensitively to the changes in fertility policy. It also implies that, because intermarriage reward less-educated minority more, they have stronger motivations to seize the opportunity of preferential fertility policies.

As discussed above, the mixed marriages induced by OCP and related preferential policies are based on somewhat different foundations from normal mixed marriages. First, we expect that individuals in these policy-induced intermarriages have higher demand of children quantity. Policy-induced intermarriage can be understood as a selection of individuals whose children demands exceed legal limits of birth. Second, realized birth number of policy-induce intermarriages should be higher than normal intermarriages, because this is what Han spouses come for. The results support these two hypotheses. Both the demand of children and realized children number are higher in policy-induced mixed families, and the effects only exist in provinces with preferential family planning policies for mixed families. Third, other aspects of marriage quality should be worse in these mixed households. According to Becker's theory (1973), marriage is a union for producing a series of commodities including: economic outputs, quantity and quality of children, social standing, companionship and love. And, China's OCP and related ethnic-based preferential policies may distort individuals' incentives in matching process and result in sub-optimal outcomes. We find that, in provinces with preferential policies, spouses in mixed families are less likely to work in high-level occupations.

The remainder of this paper is organized as follows. Section 2 is a review of previous literatures. Section 3 describes the background of China's inter-ethnic marriage and one-child policy. In section 4, we introduce the data employed for our study. The empirical results are presented and discussed in Section 5. We conclude and discuss in Section 6.

Part 2: Literature Review

Previous studies have provided several branches of theories for potentially explaining the rapid increase of intermarriage in China. Most of them also made predictions about who would be more likely to have intermarriage. First, intermarriage sometimes is used as a behavioral indicator of the degree to which two ethnic groups accept each other as equals (Kalmijn and Van Tubergen, 2010) as well as a form of interaction closely connecting the social networks of two groups. For example, a branch of literatures emphasizes the role of social boundaries between ethnic groups (Kalmijn 1991; Qian, 1997; Qian *et al*, 2012). A weakening or breaking social boundary would raise the frequency of social contacts across ethnic groups and lower down social costs associated with intermarriage. Such effects may come first to and be stronger for individuals of some specific characteristics. That is, people highly educated or living in cities usually have more chances of meeting people from other ethnic groups and also face less social pressures from interethnic marriage (Wong, 1989). Another highly influential theory for explaining intermarriage is social exchange theory originated by Davis (1941) and Merton (1941). This theory suggests that, in intermarriage, members from lower-status groups must compensate their spouses from higher-status groups with more qualities in other characteristics, such as education and looks. The third framework to understand marriage is the economic approach, which is first formally developed by Becker (1973) and extended in many directions. This approach pays attentions on rational foundations how men and women make decisions on whom to marry for utility maximization. For example, Fryer (2007) considers a simple model in which individuals only can differ on race and education. He shows that, if the cost of intermarriage is mild, then one gets interracial mixing and positive assortative matching on education. It also implies that individuals of all groups who choose to intermarry will be more highly educated. This paper contributes to understanding the formation of interethnic marriages. China's geographical and temporal variations in OCP implementation provide us a unique opportunity to investigate how individuals behaviorally response to price changes in a marriage market. Our findings are consistent with both Merton's social exchange theory and Becker's economic approach.

This paper is also closely related to the literatures on the consequences of China's family planning policy. Many studies focus on estimating how much China's family planning policy has contributed to its fertility transition and the answer is still debatable. Some conclude that family planning policy can explain a sizable share of China's fertility decline (Lavely and Freedman, 1990; Li *et al*, 2005) while others argue that the impact of policy only accounts for a small proportion (Schultz and Zeng, 1995; McElroy and Yang, 2000; Cai, 2010; Wang, 2012). On the other hand, several recent studies address the effects of one child policy on other dimensions besides fertility, such as sex ratio (Ebenstein, 2010), saving rate (Wei and Zhang, 2010), crime rate (Edlund, et al, 2008), maternal health (Wu and Li, 2012)

and man-made twins (Huang et al, 2014). Our paper is the first one investigating how China's one child policy distorts behaviors in marriage market and induces more interethnic marriages.

Part 3: Background

China's one child policy was first announced in 1978 and then it appeared in the 1982 amended Constitution with more details. Legal measures, such as monetary penalties and subsides have been employed for effective enforcement of OCP since 1979 (Banister, 1987). In early 1984, the Party Central Committee issued Central Document 7 as a guideline for local implementation of fertility policies (Greenhalgh, 1986). Due to the "practical difficulties" experienced in previous years, one important feature of "Document 7" is permitting more flexibility in local practices. For example, in 1984 a central committee suggested that 10 percent of rural couples should be allowed to have two children and this percentage should rise gradually. As a slogan of the time says, "open a small hole to close up a big one", the central government believed that such small compromise would make the whole policy much more acceptable.

The other feature of "Document 7" is the downward devolution of responsibility to local level. The provincial governments are authorized to directly design specific regulations according to their own conditions. When local governments made and implemented family planning policies, ethnic harmony always received great considerations. It's partially because ethnic harmony took at least the same weights in evaluating local government cadres' performances and the evaluation often was closely related officials' promotion. Local governments have enacted special regulations for local minorities, and these regulations were usually less restrictive compared with those for Han people. In most provinces, Han residents living in urban areas were only allowed to have just one child and those living in rural usually could have one or two. However, even in early 1990s when birth control has been encouraged in regions with dense concentrations ethnic minorities, the ethnic minorities still are treated distinctly and preferentially. In most parts of China except a few cities such as Beijing and Shanghai, if both sides of the couple are minority, they can have one or two more authorized births than Han couples. For the Tibetans, there are no limits to their birth numbers. As shown in Figure 1, around one third of provinces (1.6 million out of our 4.6 million sample living in those provinces) provide preferential policies not only to both-side-minority couples but also to mixed couples. In most cases, under these preferential policies, mixed couples are permitted to have one extra birth. As discussed in Section 1, in these provinces, minority people are endowed with a nontransferable "birth quota" which can only be shared through marriage.

[Insert Figure 1]

China is a populated country with controversial ethnic issues. According to official classification, the population of China is composed of 56 ethnic groups, among which Han group takes a dominant share of more than 90%. The share of interethnic type in all marriages more than doubled between the late 1960s and early 2000s, as shown in Figure 2, from less than 2% to more than 4%. The increasing trend of mixed marriage share accelerated after early 1980s, when local governments begun to design and implement their own specific practices of One-Child Policy (OCP). We also show the time trends of provinces with preferential policies for mixed couples and provinces without separately in Figure 2. Clearly, after the implementation of OCP in 1979, intermarriage share increased faster in provinces with preferential policies than in other provinces.

[Insert Figure 2]

In this paper, we use the average penalty rate for one unauthorized birth in the province-year panel to measure the toughness of OCP. The Penalty rate is formulated in multiples of annual income. The data of fine rate are from Ebenstein (2010) and also used in recent related studies (Wei and Zhang, 2011; Huang *et al*, 2014). Admittedly, the toughness of one child policy is embodied in several aspects and monetary fine is only one of them. However, the fine rate is still a good quantitative measure for two reasons. First, it's a sizable direct cost that people should take into account when making decisions. Second, an increase in the fine rate is usually associated with increase of toughness in other aspects. Figure 3 shows the how the level of policy violation fine changed in each province.

[Insert Figure 3 Here]

As shown in Figure 3, no matter in timing and magnitude, the fines in different provinces follow obviously different pattern. Hunan province raised the fine from one to two years of income in 1989, while Liaoning raised it from one to five in 1992 and Guizhou raised the fine from two to five years of income in 1998. This geographic and temporal variation in fine level could be viewed as the fluctuation of the value of a minority spouse in the marriage market. It helps us identify the impact of one child policy on interethnic marriage in the following empirical analysis. In general, in almost all aspects, the one child policy enforcement became stricter in the 1990s (Attane and Courbage, 2000). We also can find supporting evidence for this in Figure 3. On average, the policy violation fines in the 1990s are higher than in 1980s.

Part 4: Data

The main data used in this study are from the 2000 Population Census and the 2005 One-Percent Population Survey. The data contain ethnicity, birth year and month, region of residence, type of

residence, gender, education, and relation to the household head. For women older than 15, the data also provide information about their fertility history, including number of children ever born and number of living children. For the precise analysis of inter-ethnic marriage, we restrict the sample to those whose household heads and spouses are their first marriage between 1960 and 2005. We keep the marriages in this period because it reasonably contains long enough time before One-Child Policy in 1979 and those couples should not suffer much mortality selection by 2005. We choose first marriages only because the proportion of non-first marriages in this period is less than 5 percent and the incentive for the non-first marriages may be more complex. But it is noteworthy that either changing the period we analyzed or keeping the non-first marriages group just yields consistent results in current version.

The measure of the One-Child Policy enforcement in this study is the average monetary penalty rate for one unauthorized birth in the province-year panel from 1979 to 2000; the data are from Ebenstein (2010).[1] The One-Child Policy regulatory fine (policy fine) is formulated in multiples of annual income (Ebenstein 2010; Wei 2011). Although the monetary penalty is only one aspect of the policy and the government may take other administrative actions, it is still a good quantitative measure because an increase in the fine is usually associated with other, stricter policies. Figure 2 shows the pattern of policy fines in 1980–2000 in each province. It is obvious that fines in different provinces generally follow different patterns, both in timing and in magnitude. For example, Liaoning province raised the fine from one year's income to five in 1992, while Guizhou raised the fine from two to five years of income in 1998 and Hunan from one to two years of income in 1989. The average level of the fine was higher in the 1990s than in the 1980s, which is consistent with stricter policy enforcement in the 1990s. The geographical and temporal variation helps us identify the impact of the One-Child Policy on the inter-ethnic in the following empirical analysis.

Additional to the fine rate, we also collect data from each province about whether there is a favor policy towards the minorities from government historical documents.[2] For example, the *Population and Family Planning Statute of Ningxia* announces "Families can have one more birth, if one or both sides of the couple are from minority groups"[3]. For this minority-favor policy, we did not find much temporal variation within the same province. We code the favor policy as one if the province is found to have such a favor policy and zero for otherwise, then we plot them geometrically in Figure 3.

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[1] Details on the construction of this variable can be found in Ebenstein (2010).

[2] We find the policy across different regions on the website: http://law.npc.gov.cn/home/begin1.cbs

[3] The details of this Statute is accessible on the website of National Health and Family Planning Commission (NHFPC):
http://www.moh.gov.cn/zhuzhan/dftl/201304/08c4a176494c4d1aa8060e8c070152e7.shtml

Part 5: Empirical Results

5.1 Effects of OCP on intermarriage

We start our analysis by estimating the effects of OCP on likelihood of intermarriage. The estimation equations are as follow:

$$(1)\ Intermarriage_{ijt} = \beta_0 + \beta_1 Fine_{jt} + \gamma X + \delta_j + \theta_t + \varepsilon_{ijt}$$

$$(2)\ Intermarriage_{ijt} = \beta_0 + \beta_1 Fine_{jt} + \beta_2 Fine_{jt} * PPM_j + \gamma X + \delta_j + \theta_t + \varepsilon_{ijt}$$

where the dependent variable, $Intermarriage_{ijt}$, denotes whether individual *i* who married in year *t* and in prefecture *j* has a intermarriage or not. $Fine_{jt}$ is the fine rate violating OCP as mentioned in Section 3. Considering that individuals need a period to response to policy changes due to the searching and matching costs of marriage, the fine rate defined here is the weighted average of local fine rates in past 24 months. PPM_j is a dummy variable denoting whether prefecture *j* permit mixed couples have one extra birth or not. X is a set of control variables including dummy for residence type (urban or rural), dummy for husband's birth year, dummy for wife's birth year, and minority proportion on prefecture level. δ_j and θ_t are the prefecture fixed effects and year fixed effects respectively. We are mainly interested in β_1 and β_2, the coefficients of fine rate and interaction term. β_1 in equation (1) is expected to be positive. The fine rate can be thought as the upper bound of monetary costs for an authorized birth. The higher the fine rate is, the more valuable the "birth quota" associated with intermarriage could be. As discussed in Section 1, only when local policies are preferential for mixed couples, intermarriage can be used as a pathway to more births. Thus, in equation (2), we expect β_2 to be positive and β_1 to be smaller or even insignificant.

[Insert Table 1 Here]

The empirical results for equation (1) and equation (2) are presented in Table 1. Panel A reports the results using full sample while Panel B and Panel C report results using rural and urban sample, respectively. The coefficients in column 1 confirm our hypothesis that, an increase in the toughness of OCP will induce more intermarriages, no matter in rural or urban areas. In column 2, the coefficient of interaction term is significantly positive while the coefficient of fine rate becomes smaller for full sample or even insignificant for subsamples. It implies that, the positive association between fine rate and intermarriage is mainly contributed by sample from the regions with preferential policies for mixed couples. Column 2 also shows the effects on intermarriage are stronger in urban areas than in rural areas because the coefficient of interaction term in Panel B is more than twice of that in Panel C. The higher

distortion in urban areas may be caused by stricter implementations in cities and towns. First, in most parts of China, urban residents have to conform to the exactly "just one child" policy while rural residents follow the "conditional two children" policy in which rural households can legally have one extra birth if their first birth is a girl. Second, on average, the fine rate for urban residents is significantly higher than for rural residents. The fine rate is formulated in multiples of annual income, and a big urban-rural income gap exists in China. For a robustness check on our main conclusion, we also run regression separately on regions with preferential policies and regions without. The results (see Appendix Table A1) still support our hypothesis.

One concern about the results of column 1 is that, OCP may also change age patterns of marriage. It may potentially bring some endogeneity issues because we match the policy fine according to their marriage year. To alleviate this concern, we use the weighted average of fine rate during the two years after legally marriageable age as new independent variable. This variable is also a proxy of costs violating OCP that young people are facing when they make decisions on marriage, but it is uncorrelated with their realized marriage ages. The results of estimations on this new variable are reported in column 3, in which the coefficients are quite close to those in column 1. It implies that, the potential effects on marriage age don't change our conclusion. Column 4 and 5 report the effects of OCP on both-Han marriage and both-Minority marriage, respectively. Consistent with our previous findings, the negative coefficients show that individuals are more likely to choose intermarriage rather than endogamous marriage, when "birth quota" becomes more expensive. Interestingly, the results in Panel B and C show that, new policy-induced intermarriages often happen as the combination of a Han living in urban and a minority living in rural. That is, spouses in a policy-induced intermarriage tend to live in different areas in during premarital periods. It contradicts to the literatures of "social boundary" or "searching", but agrees with economic rationale that we have discussed. The Han living in urban areas face stricter OCPs, and they possess knowledge and resources that may help the minority get integrated into mainstream fast. On the other hand, the marginal effects of these knowledge and resources are larger for minority living in rural areas than minority living in urban.

5.2 Intermarriage and fertility

In this section, further analysis is conducted to investigate the hypothesis that OCP and related ethnic-based preferential policies have affected behaviors of intermarriage. On one hand, we expect that, in regions with preferential policies for mixed couples, Han people with high demand for children have stronger incentives for intermarriage. On the other, we also have interests about whether they have successfully achieved their fertility purposes through the pathway of intermarriage. However, the survey

of population census doesn't include questions about desired children number and thus we can't observe the demand of children directly. As a substitute, a "simulated demand" is construct of with characteristics of each person and the parameters are obtained through running regressions on the actual births of couples married before 1970[4].

[Insert Table 2]

Table 2 reports the results of regressions on "simulated" children demand and number of children born. The first three regressions are for the full sample. In column 1, a positive association is found between children demand and the interaction term. It is consistent with our argument: when the fine rate becomes high, individuals with high children demand are more likely to be pushed in mixed marriage. Column 2 and Column 3 examine whether policy-induced mixed couples actually have more births than others. The results show that mixed couples, whose marriages are induced by high fine on violating OCP, tend to have more children. And, controlling education level of the couple doesn't change the coefficient of interaction term much. All these support our hypothesis that, some Han people with high children demand take intermarriage as a pathway to evade OCP legally and successfully have more kids.

We also conduct regressions for sample of regions with preferential policies and sample of regions without separately. The results are consistent with our arguments. The positive correlations on are only found in the regions having preferential policies for mixed couples. While for regions without preferential policies, the coefficients of interaction variable are negative. In these regions, as the toughness of OCP increases, individuals involved in mixed marriage have lower demand of children quantity. In China, minority people also enjoy privileges in other dimensions such as education and employment. According to the Rules on Ethnic Identification of Chinese Citizen, child can follow either one of parents' ethnic identification. Thus, for Han people, the benefits of marrying minority also include the legal minority identification for their kids, which is associated with privileges good for kids. For example, in Guizhou, minority students enjoy extra 20 points (about 3% of the full score) in the College Entrance Exam. Then, marrying minority also serve as a pathway to improve children quality. When facing strong policy restrictions on children quantity, individuals would pay more attentions on children quality. In regions without preferential fertility policies for mixed couples, the coefficients only reflect the effects from quality side. It also implies that, the effects of OCP in regions with preferential policies probably are stronger than our estimations.

5.3 The educational attainments of couples in policy-induced intermarriage

[4] Details about the estimation of this auxiliary regression are presented in Appendix Table A2.

Previous estimations show that, OCP and related local preferential policies have induced an increase in intermarriage. Then, are these policy-induced intermarriages different from other normal intermarriages in characteristics? The next set of regressions estimate whether spouses in such policy-induced intermarriages have higher or lower educational attainments. The model specification is similar to equation (2) but the dependent variable is changed to be educational attainment. The questionnaire of census doesn't provide information about specific education year, but classify education into 5 levels from low to high. Independent variables of interests are fine rate and interaction term between fine rate and preferential policy dummy. Moreover, compared with regressions in Table 1, we add dummy variable for dummy variable for residence type (rural or urban), marriage type (both-Han, both-minority or mixed) and interaction term of marriage type and marriage year for better controlling.

[Insert Table 3 Here]

Table 3 reports empirical results for full sample, for Han sample and for minority sample, respectively. Within each group, we run regressions in further for all regions, regions with preferential policies for mixed couple and regions without, separately. The coefficients of interaction term are significant negative in regressions for full sample and for regions with preferential policies, but not for regions without preferential policies. It supports our hypothesis that OCP and related preferential policies have distorted incentives and behaviors of intermarriage in China. Low-education individuals in both groups are more likely to choose intermarriage, and the coefficients of interaction term are found to be bigger for minority people than for Han people. As we discussed before, the selection mechanisms behind are different. For Han people, low education individuals tend to have stronger preference over children quantity. While for minority people, intermarriage may bring more benefits for those with less human capital or less integrated into the mainstream society.

5.4 The outcomes of policy-induced intermarriage: occupational success and living condition

In addition, we further explore whether policy-induced intermarriage will results in different outcomes compared with normal intermarriage. Marriage can be simplified to be a two-sided matching process. Every participant in market expects to find a partner with whom he (or she) gets most the surplus of utility from their marriage. The surplus of utility is determined by the household outputs in a number of dimensions. OCP imposes a restriction on the production of children, an important dimension of the outputs by married couple. While preferential policies for mixed couple provide a pathway to evade the restriction. However, the pathway is also not costless and individuals who choose it have to make sacrifice for. In other words, OCP and related preferential policies will distort the matching process and decrease household outputs in other dimensions. Here, we choose four variables as our indicators of household outputs: employment, occupational attainment, having water closet or not and having running water or not. All these four measures focus on the economic outputs of a household. The dummy

for high-level occupation is defined as whether the respondent's occupation belongs to a group of professional occupations (e.g. teacher, highly skilled worker and government employee). The results of econometric estimation are reported in Table 4. In general, the level of fine rate is found to be negatively associated with whether the respondent holds a high-level occupation and whether his (or her) residence has running water. The coefficient of employment is positive but sometimes not statistically significant. To some extent, OCP can be understood as a kind of consumption tax. As tax rate increases, the after-tax incomes will be lower and households have less money for consumption. Moreover, according to "income effect" in economics, households also consume leisure less and work harder.

However, the variable of most interests is the interaction variable between fine rate and mixed marriage dummy. For whole sample, only the coefficient of the dummy variable for having water closet or not is found to be negative at 10-percent significant level. In further, we report the results for regions without preferential policies for mixed couple in Panel B and the results for regions with in Panel C, separately. In the subsample from regions without preferential policies, we don't find any significant correlation between the interaction term and the indicators of household outputs. While in regions with preferential policies, we find some evidence that policy-induced mixed couples are less likely to have high-level job and also less likely to have water closet in their residences. Both occupational development and living condition are closely related to marriage outputs, thus it implies that policy-induced marriages tend to have lower outputs. Moreover, such effects only exist in regions with preferential policies. The results in Table 4 support our argument that, in regions with preferential policies, intermarriage can be used for more authorized births but such a pathway is not costless.

Part 6: Conclusion and Discussion

Using the data of China's population census, this paper investigates the impact of China's One-Child Policy and related ethnic-based preferential policies on behaviors of inter-ethnic marriage and related consequences. We find that, a significant proportion of intermarriages that happened after 1980 can be explained by the implementation of OCP and related policies. Individuals (1) low-educated (2) living in urban areas (3) with a high demand of children quantity are more possible to take intermarriage as a pathway to more authorized births. Policy-induced mixed couples indeed give more births but also bear losses in other dimensions, such as occupational development and living condition.

Our findings have several important implications. First, we address the "side effects" of OCP on marriage markets, which may be ignored by policy makers. On one side, OCP may distort the matching process in the marriage market and result in bad outcomes of marriage. We show that, police-induced mixed couples bear losses in occupational development and living conditions. They may also suffer from losses in other dimensions of marriage quality, which can't be observed in our data. For example, a future extension is to study whether the divorce rate of these couples are higher than others. On the other, OCP also can be a redistributive policy through changing marriage behaviors. In some sense, the welfare

consequences of OCP are similar to a regressive tax. Because OCP mainly impose fertility restriction and penalty on households with higher demand of children, who also tend to have low education and low socioeconomic status. As shown in our paper, the existence of preferential policies for mixed couple provides a pathway for Han people to obtain one more authorized birth. And, some minority people of low education are also found to get better off through trade their "birth quotas" in the marriage market. Of course, those who fail to involve in such exchange are not better off or may be even worse off from preferential policies. And, the success of a policy-induced marriage is determined by many factors such as culture, searching costs and other personal characteristics, which are not included in our analysis. To understand the welfare consequences of OCP more deeply, we need more detailed survey data.

Second, this paper is also related to discussions on ethnic assimilation and ethnic identification. In many studies of sociology, intermarriage is employed as a measure of ethnic assimilation or ethnic integration. However, our findings show that, it may be not a perfect indicator under some conditions. On the other hand, policy-induced intermarriage may promote ethnic integration through exogenously connecting the social networks of two groups. Due to limitations of data, this argument can be not examined in our paper. But, it is worth exploring in future studies. Moreover, we find that, Han people who care about children quality also come to intermarriage for changing their kids' nominal ethnic identification, which is associated with a number of exclusive privileges. And, minority people are induced into intermarriage probably because it is a way to integration into Han's society. The implication for policy makers is that, the provision of exclusive preferential policies for the minority, probably result in an increase of "nominal" size of minority group but weaker actual sense of minority identity.

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Table 1. One-Child Policy (OCP) and Inter-Ethnic Marriage

VARIABLES	(1)	(2)	(3)	(4) Han-Han (Yes = 1)	(5) Minority-Minority (Yes = 1)
	Han-Minority Marriage (Yes = 1)				
Panel A: Full sample					
Policy fine rate before marriage	0.00239***	0.00129**		-0.000994**	-0.00140***
	(0.000660)	(0.000534)		(0.000393)	(0.000499)
Policy fine * Favor Policy for		0.00244***			
Interethnic Marriage		(0.000599)			
Policy fine at legal marriage age			0.00205***		
			(0.000604)		
Prefecture dummies	Yes	Yes	Yes	Yes	Yes
Year of Marriage dummies	Yes	Yes	Yes	Yes	Yes
Type of residence	Yes	Yes	Yes	Yes	Yes
Husband year of birth dummies	Yes	Yes	Yes	Yes	Yes
Wife year of birth dummies	Yes	Yes	Yes	Yes	Yes
Local prefecture minority proportion	Yes	Yes	Yes	Yes	Yes
Observations	4,634,086	4,634,086	4,630,128	4,634,086	4,634,086
R-squared	0.074	0.074	0.074	0.408	0.388

NOTE: Robust standard errors are clustered at province-year of marriage level.

Table 3. Inter-Ethnic Marriages Under OCP Correlated with Demand of Children and Children Born

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Full sample			H-M No Favor Policy			H-M Favor Policy		
VARIABLES	Demand of Children	Number of Children born	Number of Children born	Demand of Children	Number of Children born	Number of Children born	Demand of Children	Number of Children born	Number of Children born
Fine	-0.00944***	-0.0144	-0.0135	-0.0108***	-0.0129	-0.0113	-0.00203	-0.0144	-0.0141
	(0.00139)	(0.0112)	(0.0112)	(0.00186)	(0.0110)	(0.0111)	(0.00130)	(0.0228)	(0.0229)
Fine * Han-Minority	0.00557**	0.0303***	0.0268***	-0.00623**	-0.0295***	-0.0306***	0.00784**	0.0737***	0.0692***
	(0.00281)	(0.00893)	(0.00877)	(0.00273)	(0.00996)	(0.0102)	(0.00333)	(0.0159)	(0.0161)
Observations	4,634,086	4,459,952	4,459,952	3,106,460	2,978,633	2,978,633	1,527,626	1,481,319	1,481,319
R-squared	0.843	0.464	0.478	0.791	0.448	0.466	0.911	0.485	0.492

NOTE: Robust standard errors are clustered at province-year of marriage level. Variables controlled for are the same as those in Table 2.

Table 2. Education of Inter-Ethnic Marriages Under OCP, by Type of Marriage

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Education level (1-5)								
Sample	All Individuals			Han People			Minority People		
	Full sample	H-M No Favor Policy	H-M Favor Policy	Full sample	H-M No Favor Policy	H-M Favor Policy	Full sample	H-M No Favor Policy	H-M Favor Policy
Fine	0.00341	0.00640	0.000803	0.00188	0.00645	-0.00439	0.0133*	-0.00833	0.0354***
	(0.00321)	(0.00396)	(0.00462)	(0.00318)	(0.00394)	(0.00532)	(0.00743)	(0.00993)	(0.00570)
Fine*Han-Minority	-0.0203***	-0.00213	-0.0306***	-0.0118*	-0.000605	-0.0177**	-0.0317***	0.0151	-0.0821***
Marriage	(0.00639)	(0.00898)	(0.00806)	(0.00634)	(0.00982)	(0.00813)	(0.0111)	(0.0132)	(0.0133)
Observations	4,634,086	3,106,460	1,527,626	4,272,906	2,974,432	1,298,474	361,180	132,028	229,152
R-squared	0.318	0.283	0.317	0.305	0.283	0.300	0.385	0.299	0.358
Type of Marriage dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of Marriage dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interaction beween type and year of marriage	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type of residence	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Husband year of birth dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wife year of birth dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local prefecture minority proportion	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

NOTE: Robust standard errors are clustered at province-year of marriage level.

Table 4. Labor Market Outcomes and Family Living Conditions of Inter-Ethnic Marriage Under OCP

VARIABLES	(1) Work (Yes = 1)	(2) High level occupation (Yes = 1)	(3) Having water closet (Yes = 1)	(4) Having Running water (Yes = 1)
Panel A: Full sample				
Fine	0.000152	-0.00130*	-0.00112	-0.00192**
	(0.00109)	(0.000716)	(0.000904)	(0.000868)
Fine * Han-Minority	-0.000744	-0.00198	-0.00493*	-0.00454
	(0.00217)	(0.00223)	(0.00264)	(0.00298)
Observations	4,634,086	4,111,019	4,596,204	4,596,204
R-squared	0.173	0.370	0.422	0.440
Panel B: Areas with no H-M Favor Policy				
Fine	0.000354	-0.000502	-0.00126	-0.00181*
	(0.00148)	(0.00106)	(0.00127)	(0.00108)
Fine * Han-Minority	-0.00113	0.00118	-0.00454	-0.000795
	(0.00253)	(0.00360)	(0.00411)	(0.00497)
Observations	3,106,460	2,714,804	3,079,095	3,079,095
R-squared	0.175	0.369	0.431	0.463
Panel C: Areas with H-M Favor Policy				
Fine	0.00294*	-0.00282***	-0.000304	-0.00264*
	(0.00166)	(0.000962)	(0.00123)	(0.00140)
Fine * Han-Minority	-0.00349	-0.00383*	-0.00704**	-0.00320
	(0.00304)	(0.00198)	(0.00290)	(0.00308)
Observations	1,527,626	1,396,215	1,517,109	1,517,109
R-squared	0.164	0.331	0.373	0.365
Education of the couple	Yes	Yes	Yes	Yes
Type of Marriage dummies	Yes	Yes	Yes	Yes
Year of Marriage dummies	Yes	Yes	Yes	Yes
Interaction beween type and year of marriage	Yes	Yes	Yes	Yes
Prefecture dummies	Yes	Yes	Yes	Yes
Type of residence	Yes	Yes	Yes	Yes
Husband year of birth dummies	Yes	Yes	Yes	Yes
Wife year of birth dummies	Yes	Yes	Yes	Yes
Local prefecture minority proportion	Yes	Yes	Yes	Yes

NOTE: Robust standard errors are clustered at province-year of marriage level.

Appendix Table A1. One-Child Policy (OCP) and Inter-Ethnic Marriage, by type of living areas

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Han-Minority Marriage (Yes = 1)			Han-Han (Yes = 1)	Minority-Minority (Yes = 1)
Panel A: Urban sample					
Policy Fine	0.00265***	0.000160		-0.00187**	-0.000776
	(0.000946)	(0.000705)		(0.000844)	(0.000474)
Policy fine * Favor Policy for Interethnic Marriage		0.00797***			
		(0.00107)			
Policy fine at legal marriage age			0.00252***		
			(0.000871)		
Observations	1,681,404	1,681,404	1,680,850	1,681,404	1,681,404
R-squared	0.087	0.087	0.087	0.269	0.236
Panel B: Rural sample					
Policy Fine	0.00213***	-5.57e-05		-0.000607	-0.00152**
	(0.000602)	(0.000558)		(0.000569)	(0.000697)
Policy fine * Favor Policy for Interethnic Marriage		0.00362***			
		(0.000642)			
Policy fine at legal marriage age			0.00178***		
			(0.000510)		
Observations	2,952,682	2,952,682	2,949,278	2,952,682	2,952,682
R-squared	0.074	0.075	0.075	0.474	0.450

NOTE: Robust standard errors are clustered at province-year of marriage level. Variables controlled for are the same as those in Table 1.

Appendix Table A2. One-Child Policy (OCP) and Type of Marriage

VARIABLES	(1)	(2)	(3)	(4)
	Han-Minority Marriage (Yes = 1)			
	Areas with no Favor Policy for Interethnic Marriage		Areas with Favor Policy for Interethnic Marriage	
Panel A: Full sample				
Policy fine rate before marriage	0.000978**		0.00421***	
	(0.000449)		(0.00127)	
Policy fine at legal marriage age		0.000185		0.00483***
		(0.000359)		(0.00112)
Observations	3,106,460	3,105,085	1,527,626	1,525,043
R-squared	0.071	0.071	0.069	0.069
Panel B: Urban sample				
Policy fine rate before marriage	0.000422		0.00825***	
	(0.000703)		(0.00195)	
Policy fine at legal marriage age		-0.000124		0.0101***
		(0.000476)		(0.00186)
Observations	1,383,597	1,383,189	297,807	297,661
R-squared	0.077	0.076	0.074	0.075
Panel C: Rural sample				
Policy fine rate before marriage	0.00129**		0.00217**	
	(0.000522)		(0.00107)	
Policy fine at legal marriage age		0.000941*		0.00213**
		(0.000515)		(0.000839)
Observations	1,722,863	1,721,896	1,229,819	1,227,382
R-squared	0.073	0.073	0.069	0.069

NOTE: Robust standard errors are clustered at province-year of marriage level. Variables controlled for are the same as those in Table A1.

Appendix Table A3. Children Demand Function

VARIABLES	(1) Number of children
Wife's education level (Reference group is illiterate)	
Primary School	-0.158***
	(0.00696)
Junior High	-0.348***
	(0.0102)
Senior High	-0.580***
	(0.0178)
College +	-0.760***
	(0.0287)
Husband's education level (Reference group is illiterate)	
Primary School	-0.0254**
	(0.0105)
Junior High	-0.0466***
	(0.0114)
Senior High	-0.109***
	(0.0144)
College +	-0.200***
	(0.0192)
Constant	2.413***
	(0.126)
Province dummeis	Yes
Type of residence dummies	Yes
Survey year dummies	Yes
Interaction of the above three	Yes
Observations	170,024
R-squared	0.199

Note: Standard errors in parentheses. Sample is those couples married no later than 1972.

*** p<0.01, ** p<0.05, * p<0.1

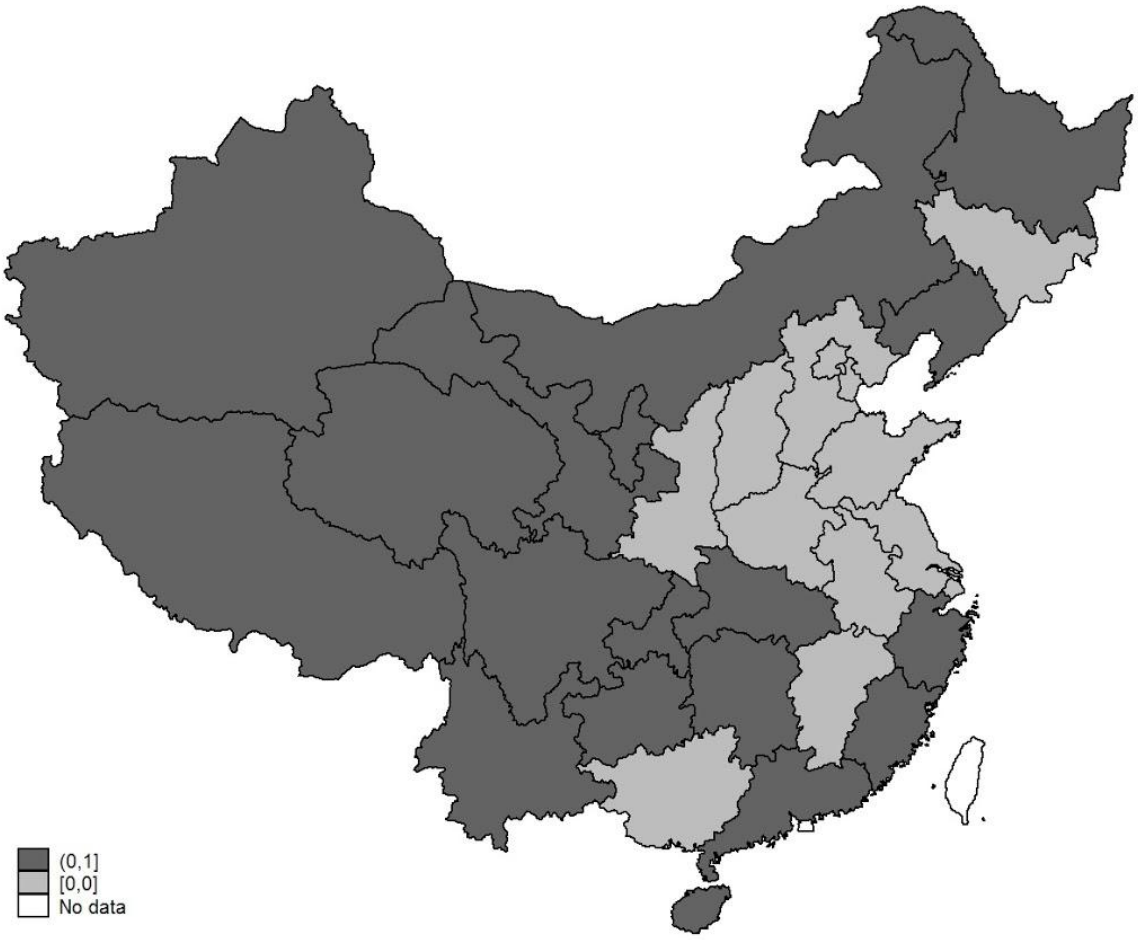


Figure 1. Authorized Number of Children for Ethnic Minorities in Some Provinces, Early 1990s

Data source: http://law.npc.gov.cn/home/begin1.cbs

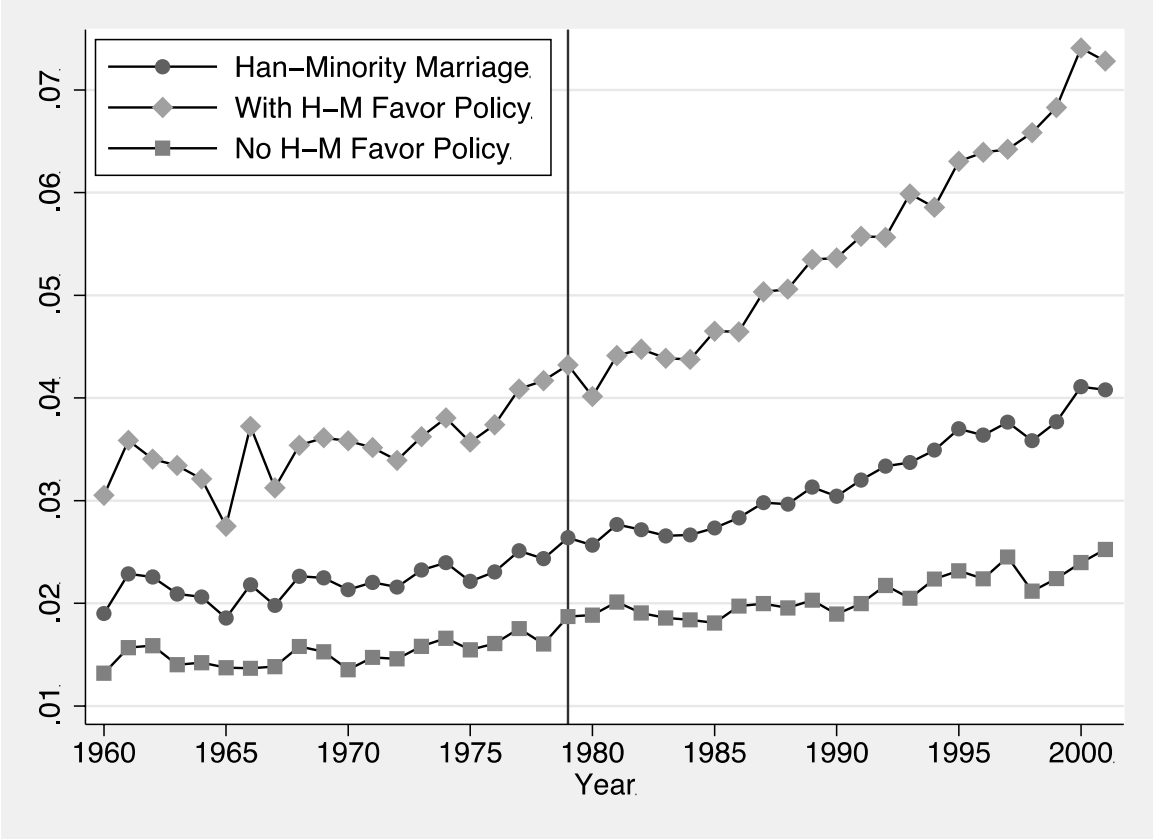
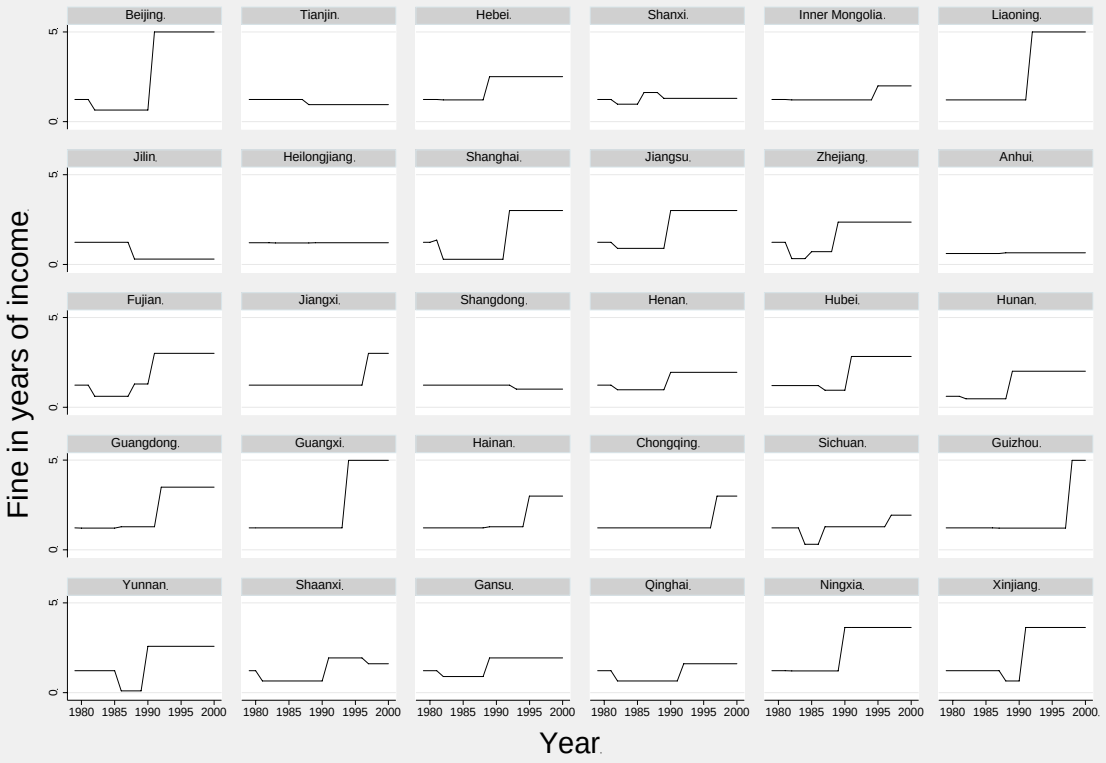


Figure 2. The share of intermarriage in all marriages, 1960-2005

Data source: China Census 2000 and Population Study Sample 2005.



Note: Data source is Ebenstein (2010).

Figure 3. One-Child Policy Regulatory Fines in 1980-2000, by Province.