



The Impact of the State's Abortion Policy on Induced Abortion Among Married Women in China: A Mixed Methods Study

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Abstract: This study uses mixed methods to investigate the effects of the state's abortion policy on induced abortion among married women in China. I employ both quantitative analysis of data from the 1988 and 2006 National Family Planning and Reproductive Health Surveys and thematic analysis qualitative data from 140 in-depth interviews. Results show that the more stringent the abortion policy, the more likely married women are to have an induced abortion. Women become less vulnerable to enforced induced abortion during a loosened policy period. It is suggested that the implementation of a financial penalty in the form of the Social Maintenance Fee (She-Hui Fu-Yang Fei) and the discontinuation of using abortion rates for administrative evaluations are likely to contribute to this process.

Introduction

China's abortion policy loosened in the mid-1990s (Peng 1997; Zhang 2007; Wang 2012a; Wang 2014a; Wang and Liao 2016). Meanwhile, evidence suggests that the induced abortion rate among women has decreased from 41.37 percent, the average rate from 1980 to 1994, to 20.09 percent, the average rate from 1995 to 2006 (Wang 2014b). Previous studies have argued that there is an association between the stringency of abortion policy and the induced abortion rate (Arnold and Zhaoxiang 1986; Li et al. 1990, 1999;

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He 2006; Bai et al. 2007; Li, Wei, and Feldman 2007; Wang 2011, 2014b). However, it is unclear whether there is a causal link between the two.

This study focuses on the effect of abortion policy on induced abortion among married women. It is organized as follows. First, China's abortion policy and its implementation are reviewed in detail. Based on official documents and previous studies, this study divides roughly the last three decades of Chinese history into two periods: the tightened policy period of 1980–1994 and the loosened policy period of 1995–2006 (see Peng 1997; Zhang 2007; Wang 2012a, 2014a; Wang and Liao 2016). It is worth noting that how “tight” or “loose” a policy period is can only be relative. The study uses the terms “tightened” and “loosened” to refer to the policy period under consideration as compared to its preceding period (see Wang 2012b, 2014a, 2014b; Wang and Liao 2016). During the tightened policy period more so than in the later period, the government more rigorously enforced its induced abortion policy on married women with at least one child. In the next section, mixed methods are employed to explore the causal link between the state's abortion policy and induced abortion among married women. A set of regression methods is used to explore the causal link between them, supplemented by thematic analysis of qualitative data. Results from statistical models and thematic analyses are presented in the “Results and Findings” section. Conclusions and discussion are presented in the last section.

China's Abortion Policy

Abortion policy refers to the abortion-related regulation under the restriction of the birth quota, which is nested within birth control policy. Birth control policy, or family planning policy, is used to refer to a set of comprehensive regulations, including the contraception policy, abortion policy, financial penalty in the form of the Social Maintenance Fee (*She-Hui Fu-Yang Fei*),¹ informed choice policy, and quota on the number of births.

Aiming to restrain its population growth in the early 1970s, China launched a nationwide family planning program to offer birth control and family planning services to married couples. In 1979 this program initiated the one-child policy in both urban and rural areas. One of the most rigorous family planning policies in the world, it primarily targeted the Han Chinese, and implemented birth control regulations regarding married women's reproductive behaviors such as sterilization, intrauterine devices (IUDs), and induced abortion (Peng 1997; Li, Zhang, and Zhu 2008; Wang 2012a, 2014b; Wang and Liao 2016).

Induced abortion has been one of the prioritized methods of preventing unauthorized births under the Chinese family planning policy since the early 1980s (Wang 1988; Greenhalgh 1994; Qiao 2002; Wang 2012a, 2014a,

2014b). However, its implementation changed from a mandatory approach during the 1980s and early 1990s to a nonmandatory approach from the mid-1990s onward (Attane 2002; Wang 2014a, 2014b; Wang and Liao 2016). This transition was made possible by two abortion policies with stringency levels looser than the one in the 1980s (Wang 2012b, 2014a, 2014b; Wang and Liao 2016). The two induced abortion policies were separately included in an open letter from the Central Committee of the Chinese Communist Party (CCP) to advocate the one-child policy in 1980, and a client-centered contraceptive approach of informed choice in 1994. The latter was also known as the IC policy, and it aimed to empower married women's reproductive rights to informed choice regarding contraception and induced abortion (Fang et al. 2002; Wang 2012a). Therefore, based on the conventions of official documents and previous studies, this study divides the years from 1980 to 2006 into two periods: the tightened policy period of 1980–1994 and the loosened policy period of 1995–2006 (see Peng 1997; Zhang 2007; Wang 2012b, 2014a; Wang and Liao 2016).

The Tightened Policy Period

At the beginning of the tightened policy period, the Chinese government implemented the mandatory one-child policy to “slam the brakes” on rapid population growth (Zeng 2007). Four approaches (*si-zhong shou-shu*) were employed by local governments to achieve population targets: (1) IUD insertion, (2) tubectomy, (3) vasectomy, and (4) induced abortion. As a result, these four approaches reshaped China's birth control mode into three steps: (1) *yi-huan* (mandatory insertion of an IUD in all women within six months of delivering their first-born), (2) *er-zha* (sterilization for either the man or the woman after a couple has their second child), and (3) *san-gua* (induced abortion for women with a third or unauthorized pregnancy; Greenhalgh 1994; Peng 1997; Wang 2012a, 2014a). This induced abortion policy was enforced through “shock drives” (*tu ji*) on a large scale such as intensive education programs for citizens and abortion campaigns (*qun-zhong-yun-dong*) targeting married women (Hardee-Cleaveland and Banister 1988; Qiao 2004; Wang 2014a). For example, the local governments would launch large-scale compulsory abortion campaigns at the end of a year such as the intensive sterilization and induced abortion movements from 1983 to 1984 and the intensive IUD movement from 1993 to 1994 (Wolf 1986; Wang 2012a). Local government officials were held directly accountable for meeting population targets; they would be removed from their posts or reduced to a lower rank if they failed (Rigdon 1996; Wang 2014a).

As a result, the four approaches contributed to a reduction in the total fertility rate (TFR) (Coale et al. 1991; Tu and Smith 1995) which fell from

2.92 in 1979 to 2.42 in 1983 (National Population and Family Planning Commission of P.R. China, and China Population and Development Research Centre 2013). The average induced abortion rate reached the highest level worldwide (46.32 percent) during the period of 1979 to 1988. In particular, the highest annual induced abortion rate was 56.07 percent in 1983 with an estimated 14,370,000 induced abortions performed nationwide that year (Wang 2014b).²

The Loosened Policy Period

However, the rigorous implementation of the abortion policy gave rise to severe public dissatisfaction, to the extent that fierce revenge was exacted by married women and men on local birth control cadres (Sun 1990). In response to public dissatisfaction and the International Conference on Population and Development (ICPD),³ in 1994 the Chinese government initiated a client-centered approach to empower women's reproductive rights and to ensure their informed choice in contraceptive methods and induced abortion methods. The IC policy marked the beginning of the loosened policy period (Fang et al. 2002; Wang 2012b, 2014a). During this time (and continuing to the present), the induced abortion rate was removed as an indicator for evaluating local administrative performance. Therefore, the stringency of implementing mandatory induced abortion was gradually relaxed and the social conflicts arising from its enforcement were reduced (Wang 2012a). Additional policy changes included the restriction of second-trimester and third-trimester abortion and the permission of a second birth under certain conditions. For example, rural families could have a second child if their first child was a girl or was disabled. Also, ethnic minorities could have more than one child and be exempted from induced abortion (Peng 1997; Wang 2012a). In practice, the policy was implemented through high-quality care services (*youzhi fuwu*; Wang 2012b).

Since their implementation in 2002, the Family Planning Technical Services Regulations and the Population and Family Planning Law have served as an underpinning of family planning policies in China. Although these laws continued to promote the one-child policy, they conferred new reproductive rights on married women. These rights included the right to decide the timing and the spacing of two (authorized) births, the right to freely choose contraceptive methods, and the right to legally avoid a second-trimester abortion. One of the most important articles in the Population and Family Planning Law was on collecting a financial penalty in the form of the Social Maintenance Fee (Zhang 2007; Wang 2012a, 2014b). According to Article 41, provincial family planning bureaus can collect fines, or the "Social Maintenance Fee," in an effort to relieve economic burdens from families who have violated the one-child policy by imposing

unauthorized children on society.⁴ The fee was based on annual disposable income for city residents, and on annual cash income for peasants. The fee typically ranges from three to ten times the family's annual income (Zhang 2007), but there is a wide variation across provinces. For instance, a husband and wife in Shanghai will each pay 110,000 CNY—three times the city's average annual post-tax income—for a second child (Guo 2014). Since this penalty was instituted nationwide in 2001, women have been provided with the choice of either paying the fines to legalize unauthorized births, or undergoing an induced abortion.

There was a significant decrease in the rates of induced abortion after changes to China's abortion policy were implemented. In the tightened policy period, the average prevalence rate of induced abortion was 41.37 percent. By contrast, in the loosened policy period, the average prevalence rate was 20.09 percent (Wang 2014b).

Factors Influencing Induced Abortions

Previous studies have identified factors influencing induced abortions in China, both at the individual and community levels. At the individual level, several studies have found that married Han Chinese women were more likely to receive an induced abortion. This was because China's abortion policy primarily targeted the Han Chinese, and not ethnic minorities (Anderson and Silver 1995; Li, Zhang, and Zhu 2008; Wang 2014a, 2014b; Wang and Liao 2016). Women who were not well educated, lived in rural areas (Wang et al. 1991; Tu and Smith 1995; Steele, Diamond, and Wang 1996; Giusti and Vignoli 2006; Wang 2012b), and whose youngest living child was a girl were more likely to undergo an induced abortion (Junhong 2001; Banister 2004; Nie 2011; Wang 2014a, 2014b). The risk of being forced to undergo induced abortion for women whose youngest living child was a girl was significantly higher than those whose youngest living child was a boy. This can be explained in part by the "son preference" deeply rooted in Chinese child-bearing culture (Arnold and Zhaoxiang 1986; Junhong 2001; Murphy 2003). To reconcile the conflict between the one-child policy and son preference, some women would resort to sex-selective abortions of female fetuses. As a result, sex-selective abortions increased and discrimination against girls was further exacerbated (Greenhalgh and Li 1995; Qi and Mason 2012).

At the community level, a region's economic development and urbanization were found to be negatively correlated with induced abortion (DeGraff, Bilsborrow, and Guilkey 1997; Chen 2002; Qiao 2002; Löfstedt, Shusheng, and Johansson 2004; Wang 2014a, 2014b). Abortion rates in developed countries have tended to be lower than those in the underdeveloped countries, and the observed decline has been greater in developed regions than in developing countries (Sedgh et al. 2007). Increasing access to urbanization

has the potential to reduce the incidence of unwanted pregnancies, lower the prevalence of abortion, and contribute to improved maternal health outcomes (Rokicki, Montana, and Fink 2014).

Inconsistent findings have been reported regarding the association between the abortion policy and induced abortion among married women. Some argued for a positive association based on samples from selected provinces, or from purely qualitative research in one province. These studies have suggested that the less stringent the family planning program, the less likely a woman was to undergo an induced abortion (Arnold and Zhaoxiang 1986; Li et al. 1990, 1999; Li, Wei, and Feldman 2007; Wang 2011). In addition, Qiao (2004) found that the majority of induced abortions occurred due to an unauthorized pregnancy violating the family planning policy. On the contrary, based on one municipal sample, He (2006) and Bai et al. (2007) argued that the loosened family planning program led to a significant increase in the number of induced abortions.

Although previous studies have suggested that there was an association between the abortion policy and induced abortion among married women, to date there have been no studies using nationally representative data that have explored the causal link between them. This study aims to fill this gap using a set of regression methods, supplemented by thematic analysis of qualitative data.

Data and Methods

Since Chinese abortion policy targets married women of reproductive age, this study focused on married women (ages 20–49) and living in mainland China. This study employed an integrated mixed methods approach that utilized and analyzed both quantitative and qualitative data. The underlying rationale of mixing quantitative and qualitative data is that neither method, on its own, is sufficient to answer the research questions. When used in combination, quantitative and qualitative methods complement each other and yield a more complete analysis (Creswell, Fetters, and Ivankova 2004).

First, the study identified the social determinants of the choice of induced abortion and presented a counterfactual model to analyze the causal effect of the state's abortion policy on married women's abortions. Second, to deepen the understanding of the effect that abortion policy had on induced abortion among married women, this study collected and analyzed qualitative data from yearly in-depth, follow-up interviews of married women, birth control cadres, and doctors from 1996 to 2010.

In this analysis, the policy effect is, in essence, a treatment effect. Thus, this study faced two analytical challenges. First, it relied on only observational data instead of experimental data for the analysis. That is, induced

abortion methods were enforced in the tightened policy period, but married women could not be randomly assigned to live in that period as opposed to the later, loosened policy period. Second, there was no exact quantifiable to measure the stringency of varying policies, and it could be problematic simply to rely on using time periods as an indicator to measure policies when many other factors may have changed as well.

To deal with the first challenge, this study estimated a series of analyses via three types of models: (1) zero-inflated negative binomial models, (2) c (PSM), (3) and difference-in-differences estimation (DID). To find a reasonable way to measure “policy,” this study employed two proxy variables as surrogates. The primary proxy variable was ethnicity, and the secondary proxy variable was the policy period. In both of these policy periods, the abortion policy only officially targeted Han Chinese women (the majority ethnic group in China) to prevent unauthorized births, and not the ethnic minority groups (e. g., Peng 1997; the Population and Family Planning Law 2001; Li, Zhang, and Zhu 2008). Although it is possible that women from ethnic minority groups could have also been affected by the abortion policy to some degree, following previous studies this study assumed the influence on them was ignorable (see Li, Zhang, and Zhu 2008; Wang 2014a; Wang and Liao 2016). The Han Chinese women in the tightened period were considered as the group treated with a restrictive or tightened policy, while the non-Han Chinese women in the loosened period were considered as the group treated with a more relaxed or loosened policy. This study used both the primary proxy variable (ethnicity) and the secondary proxy variable (time period) to achieve a better understanding of how the policy change has yielded impact.

To further understand and explain how the stringency of the abortion policy affected induced abortion among married women, this study included qualitative interview data as well. The in-depth interviews provide insight on how the abortion policy affected birth control cadres’ motivation to enforce induced abortion, and how women responded to the policy shift and the implementation of the Social Maintenance Fee in the loosened policy period.

Data

To estimate the impact of the state’s abortion policy, this study used individual-level pooled data from the 1988 and 2006 National Family Planning and Reproductive Health Survey (hereafter referred to as the 1988 survey and the 2006 survey),⁵ a nationally representative sample survey conducted by the Chinese National Family Planning Commission. The surveys utilized a stratified multistage clustered sample to collect information from 2,100,000 women in 1988 and 33,257 women in 2006 in thirty-one provinces, autonomous regions, and municipalities directly under the Central

Government in China. One of the objectives of these surveys was to explore the determinants of reproductive behaviors at the individual level among women. Questionnaires collected women's socioeconomic and demographic information and pregnancy and abortion histories (including the outcome of each pregnancy, and types, reasons, frequency, and dates of abortions).⁶

To estimate the influence of the state's abortion policy, the data on induced abortions performed between 1980 and 1988 were selected from the 1988 survey to represent the tightened policy, while corresponding data from induced abortions performed between 1995 and 2006 were extracted from the 2006 survey to represent the loosened policy. To meaningfully analyze how China's abortion policy has affected the number of married women who have undergone induced abortion, this study analyzed data on married women with at least one child, identified by the 1988 and the 2006 surveys. After validation testing and merging of data with different assigned weights, 398,698 married women remained in the analytic sample.

As for the qualitative data, the field research team conducted in-depth interviews with respondents in 1996 and followed up annually until 2010 in eight provinces (Fujian, Jiangsu, Henan, Shandong, Gansu, Sichuan, Yunnan, and Guangxi) in China. An information saturation method based on theoretical sampling among the married women in the 1988 and 2006 survey was used.⁷ The interviews included 88 married women who had undergone an induced abortion as well as 19 local family planning cadres and 33 local doctors in eight provinces based on regional stratification according to levels of economic development. The overall sample attrition rate was 8.7 percent.

In the in-depth interviews, married women who had an induced abortion were asked about their reasons for terminating their pregnancies, the method of induced abortion, and their interaction with local family planning cadres and doctors. Local family planning cadres were asked about the changes in the stringency of the abortion policy, the degree to which their administrative work on unauthorized pregnancies had affected their performance evaluation, and their adherence to the abortion policy. The doctors were asked about their induced abortion operations and their interactions with clients. Informed consent was obtained for all interviews. The research design considered a number of ethical issues. Participants were informed of the purpose of the study, that quotes would be used anonymously, and that they could stop the interview at any point. All participants were assured of confidentiality and anonymity, and they granted permission to record interviews. The mean response rate among all participants was 83.9 percent.

Methods

This study applied two sets of statistical analyses with proxy variables to estimate the effect of the state's induced abortion policy on induced abortion

among married women. First, the zero-inflated negative binomial (ZINB) models were used to estimate the social determinants of induced abortion, including the induced abortion policy and individual demographic factors. Second, the PSM and DID estimation were jointly employed to tease out the relationship between the state's abortion policy and induced abortion among married women.

The dependent variable was the number of induced abortions (count variable). The treatment variable was the stringency of the state's abortion policy in the regression models, and it was instrumented by the interaction of ethnicity and time period. Such a substitution is valid because when one variable is unobservable, a proxy variable can be used, even if it may be slightly correlated with model residuals (see e.g., Heckman and Robb 1985; Newhouse and McClellan 1998).

Other explanatory variables included the number of living children, age, *hukou*, educational attainment (primary school and below, middle school, high school, college, and above), region of residence (east, central, west), sex of the youngest living child (boy, girl), and per capital gross domestic product (GDP) at the county level (logarithm of per capita GDP). The inclusion of these control variables was consistent with prior research (Wang 2012b, 2014a, 2014b; Wang and Liao 2016). Table 1 presents the descriptive statistics of the variables.

The ZINB model was used to validate the fact that the state's abortion policy was one of the important factors influencing married women's induced abortion, and the proxy variable method made it possible to estimate the effects of the induced abortion policy. However, this effect was not a net effect in essence, and it could not tease out the causal relationship between the state's abortion policy and married women's induced abortion. To address this concern, this study introduced the estimation of PSM and DID.

A logistic regression model was utilized to estimate the propensity score of being treated (*tightened policy* = 1, *loosened policy* = 0). This was used to match individuals in the analytic sample. All "matched" individuals who were in the loosened policy period were included in a control group, and all "matched" individuals who were in the tightened policy period are included in the treatment group. Thus, the treatment effect was estimated from the matched sample. This analytic approach had several advantages. For example, it could remove selection bias to a great extent and did not assume a functional form of the relationship between outcomes and predictors.

Next, the DID was used to estimate the impact of the abortion policy on induced abortion among married women, and to identify the causal relationship between them. This was based on the comparison group data selected by PSM. The loosened policy served as the control group, and the tightened policy served as the treatment group. The advantages of a DID model over

Table 1

Sample Summary Statistics of Married Women in 1988 and 2006 Surveys in China

Variable	Mean (SD)		
	Whole sample	Subsample (1988 survey)	Subsample (2006 survey)
Induced abortions	0.375 (0.726)	0.398 (0.727)	0.336 (0.707)
Tightened policy period (loosened = base)	0.929	–	–
Hanethnicity (non-Han = base)	0.897	0.896	0.907
Number of living children	1.976 (0.922)	1.515 (0.875)	2.021 (0.914)
Age	33.793 (7.616)	33.692 (7.577)	34.827 (7.929)
Education: primary and below*	0.621	0.635	0.484
Middle school	0.249	0.240	0.341
High school	0.114	0.113	0.123
College and above	0.016	0.012	0.052
Urbanhukou (rural = base)	0.247	0.245	0.257
Living region: east*	0.396	0.396	0.396
Central	0.299	0.297	0.320
West	0.305	0.307	0.284
The youngest living child: girl (boy = base)	0.459	0.456	0.499
Logarithm per capita GDP (lnGDP)	5.816 (0.589)	5.610 (0.485)	6.893 (0.466)
<i>N</i>	398,698	370,193	28,505

Source: Based on the 1988 and 2006 National Family Planning and Reproductive Health Survey.

Note: *indicates the reference group for a categorical variable.

other commonly used modeling methods were twofold. First, the DID model helped to remove the influence of the unobservable heterogeneity to a great extent such as individual propensity and the *danwei* (work unit) system. For example, women in a *danwei* had their reproductive behavior more effectively monitored than women who were unemployed (Zhang 2007). Second, the DID model can assess the net effect of the tightened induced abortion policy on induced abortions in relative to the loosened policy, and establish the causal link between the two.

To explore the qualitative data, each interview was recorded and transcribed verbatim. The data were analyzed using a thematic analysis

approach. Initial categories for data analysis were drawn from the interview guide. Issues for further exploration were prioritized for final analysis under the guidance of the Theory of Actor-Network (Latour 1987).

Results and Findings

Table 2 presents the results of fitting four parsimonious ZINB models, the subsequent likelihood ratio tests for nested models ($p > 0.05$), and the Vuong tests of the four models ($p < 0.001$). The full model examined the determinants of induced abortion in all women. The other three models showed how induced abortion varied among women based on the number of living children. The results indicate that induced abortion policy and other explanatory variables (such as the number of living children, age, education level, region, *hukou* and sex of the youngest living child) were all statistically significant determinants of induced abortion outcomes ($p < 0.001$).

As expected, in the model testing of the policy and count outcomes, the influence of the induced abortion policy was substantial. Policy stringency was found to be a significant determinant of count responses: The more rigorous the induced abortion policy, the more likely a married woman was to have undergone an induced abortion. The incidence rate ratio (IRR) of induced abortion under the tightened policy was 134.99 percent ($=e^{0.30}$), far more than it had been under the loosened policy. That is, married Chinese women living during the loosened policy period were less likely to undergo an induced abortion than those living during the tightened policy period.

The statistical significance of the estimate of the policy effect remained when a set of PSM method tests was applied. Table 3 presents the results of the estimated average treatment effects for the treated group (ATT) based on five PSM methods. The results were robust and significant ($p < 0.001$). It appears that without the tightened policy, the incidence rate of induced abortion among married women would have decreased within the range of 0.36 to 0.41. In other words, women under the loosened induced-abortion policy had a lower rate of induced abortion than the control group who had been under the tightened policy. Although this seemingly counterfactual inference may include complex effects, such as women's reproductive preferences, the expansion of contraceptive techniques and socioeconomic development in the region, it could be concluded that without the tightened induced abortion policy, the induced abortion rates would have decreased.

Table 4 presents the results of DID estimation. The point estimate of the DID was 0.39, which was statistically significant ($p < 0.001$). The results indicated a nonzero difference between the treatment group (tightened

Table 2

Estimates for the Coefficients of Factors Associated with Induced Abortion Among Married Women from the Zero-Inflated Negative Binomial Models

Parameter	Coefficient (SE)			
	Full model	1 child	2 children	≥3 children
Tightened policy	0.300** (0.009)	0.286** (0.014)	0.338** (0.017)	0.199** (0.018)
Number of living children	0.265** (0.005)	—	—	—
Age	0.240** (0.006)	0.278* (0.011)	0.140** (0.014)	0.050** (0.025)
Age square	-0.003** (0.000)	-0.004* (0.000)	-0.002** (0.000)	-0.002** (0.000)
Education: middle school	0.234** (0.008)	0.117** (0.012)	0.220** (0.013)	0.278** (0.017)
Education: high school	0.181** (0.010)	0.078** (0.014)	0.259** (0.018)	0.361** (0.031)
Education: college and above	0.093* (0.020)	0.033 (0.023)	0.265** (0.038)	0.463** (0.083)
Urban <i>hukou</i>	0.472** (0.008)	0.159** (0.011)	0.574** (0.014)	0.758** (0.016)
Living region: middle	-0.087** (0.008)	-0.046** (0.013)	-0.073** (0.015)	-0.083 (0.016)
Living region: west	0.054** (0.009)	0.083** (0.014)	0.162** (0.016)	-0.021** (0.017)
Girl of the youngest living child	0.094** (0.006)	0.141** (0.009)	0.137** (0.011)	0.173 (0.141)
lnGDP	-0.080** (0.007)	-0.043** (0.009)	-0.196** (0.04)	-0.003 (0.016)
Constant	0.574** (0.016)	1.982** (0.009)	1.110** (0.063)	0.048 (0.058)
Inflated factors (omitted)				
Vuong (Z-value)	16.08	14.72	13.46	11.52
N	398,698	122,765	110,918	147,817

Notes: * $p < 0.01$, and ** $p < 0.001$.

GDP = gross domestic product; SE = standard error.

Table 3

Estimated Effects of the Policy Shift on Induced Abortion Using Five Propensity Score Matching Methods (N = 398,698)

PSM methods	Treated effect	Untreated effect	ATT	Robust SE
K-nearest neighbors matching	0.604	0.206	0.398*	0.025
Radius caliper matching (0.0001)	0.675	0.272	0.403*	0.041
Kernel matching	0.664	0.303	0.361*	0.026
Bootstrap method matching	0.736	0.327	0.409*	0.039
Spline matching	0.657	0.298	0.359*	0.066

Notes: * $p < 0.001$.

PSM = propensity score matching.

policy) and the control group (loosened policy). Further inference could be made that the transition from the tightened policy to the loosened policy led to a 39 percent decrease in the incidence of induced abortions.

Two of the most direct policy changes from the tightened policy period to the loosened policy period were the implementation the Social Maintenance Fee to legalize citizenship for unauthorized children and the removal of the abortion rate as part of the administrative evaluation of birth control cadres. These modifications led to corresponding changes in married women, local birth control cadres, and local doctors. Through the theoretical lens of Actor-Network Theory, I distilled the themes from interactive processes

Table 4

Estimated Average Treatment Effects of the Policy Shift on Induced Abortion Using Difference-in-Differences Estimation (DID) (N = 398,698)

Induced abortion	Post-test			Pre-test			DID effect
	Treatment group (Han)	Control group (non-Han)	Diff.	Treatment group (Han)	Control group (non-Han)	Diff.	
Coefficient	0.626	0.114	0.512*	0.238	0.112	0.126*	0.386*
Robust SE	0.018	0.021	0.029	0.009	0.026	0.041	0.035

Note: * $p < 0.001$.

among birth control cadres, doctors, and married individuals, and identified their strategic actions.

Decreased Abortions Due to the Implementation of the Social Maintenance Fee

The implementation of the Social Maintenance Fee enabled women to gain an extra authorized birth at the cost of economic resources. Married women who could afford the financial penalty were able to legally pay for an extra legal birth. Such a legalization process was not allowed during the tightened policy period. Pregnant women who could not afford the heavy fees would usually try to escape from induced abortion by hiding until their children were born. Therefore, for women with more economic power, induced abortions were no longer a major threat.

When asked to compare induced abortion in different time periods, a woman (48 years old, with two daughters and one son, living in a village, with 5 years of formal education, and working on the farm) said:

Forced induced abortion? It is a has-been. Nowadays, the family planning cadres won't force you into abortion unless you really go to extremes in violating their demands and not giving them face. I only heard that in our adjacent village, a woman desperate for a son gave birth to three girls but still had another unauthorized pregnancy. She was too poor to pay the fines, so the fourth pregnancy was aborted.

A man (42 years old, with a daughter and an unauthorized son, living in a village, with 10 years of formal education, and working as a self-employed wood processing businessman) said:

Want more children? Money is everything! You could easily make the unauthorized children legal by simply paying the fine. If you are poor, you can run away to cities or other villages to escape the inspection of the local birth control cadres. They would have arrested you anywhere in the past, but now they just don't care that much, and they let you run away with one eye open and the other eye closed [Chinese proverb: acquiescence]. Nowadays, a woman would be stupid to sit at home waiting for them to find that she is pregnant.

When asked what he thought about unauthorized children not being able to have *hukou* or access to school without parents paying the fines, he explained:

Hukou is not a big deal now. You are right, and my son can't go to school. But it's not a big deal. I would be satisfied if he could read some basic characters. Besides, going to school won't make you rich.

You earn money by working in cities, and you don't need *hukou* working there. We have insiders who can get in by the back door.

Another woman (45 years old, with a daughter and an unauthorized son, who had obtained a *hukou* without paying any fines, living in a village, with 8 years of formal education, and working on a farm) proudly said:

I got my son a *hukou* without paying anything! Others are envious of my success. I think my son is just blessed to be lucky in his life: There was a census two years after his birth and everyone who didn't have a *hukou* could just have it for free. He could have his portion of lands with *hukou*.

As illustrated by the above interviews, married individuals have detected the looseness of abortion policy and they have figured out an optimal strategy, which was to gain birth quotas at the cost of financial loss. Individuals are active participants of the interactive processes of policy shift in the sense that they were flexible to adjust their attitudes and actions in response to changes in abortion policy, which was indispensable for the successful implementation of the policy.

Birth Control Cadres' Decreased Power in Dealing with Unauthorized Pregnancy

Under the new environment of the loosened policy, the birth control cadres lacked the motivation to rigorously implement the one-child policy since the abortion rate was no longer used for their administrative evaluation.

When asked to compare his work before and after the policy change, a man (62 years old, living in a town, with a high school diploma, and working for the local Birth Control Bureau) said:

We were very influential in those days (during the tightened policy period). Most women (with an unauthorized pregnancy) were forced into abortion; for those who managed to run away and give birth, we could take away their baby and put them into an orphanage. I know they hated us. But that's how things were supposed to be, and you got promoted quickly if you could be the most rigorous official. Now (in the loosened policy period) we can't do that... We won't get promoted by forcing abortion, and also we will get into trouble by doing that. Some journalists are eager for this kind of story and condemn us. The best we can do is to collect the fines. For those die-hards who don't pay but still give birth, there's nothing we can do about them!

Under the loosened policy period, birth control cadres realized the shrinkage of their power, the possible expansion of their economic gain via collecting the fines, and adopted a more lenient approach in policy

implementation. Their new approach positioned them in less confrontational rivalry with married individuals and contributed to the decrease in induced abortion.

Local Doctors' Perception of the Policy Change

A local doctor (58 years old, living in a town, with a bachelor's degree, and working in the local hospital) described her working experience before and after the policy change:

We had very heavy workloads before. It was extremely hard to escape abortion if women had experienced an unauthorized pregnancy, and there were almost no fish that escaped from the net (Chinese proverb) as far as I knew. You know, sometimes some women bribed us to help them escape the abortion operation and fake an abortion document, since we are all close relatives living in such a small community. But I couldn't; otherwise I would be fired. Now, it's quite different. Women typically don't need to worry about abortion when they have an unauthorized pregnancy—they just need to pay the fine. I did hear from the newspapers there are some rare cases in which women are still forced into abortion now if they have an unauthorized pregnancy and don't pay the money. But those are quite exceptional cases, and I didn't hear of any in our town. There's a decreasing number of patients for us now, and actually I am thinking about switching to another job.

The perspectives from local doctors validated the perspectives of married individuals and birth control cadres. As people who executed induced abortion directly, doctors knew very well their possible gain and loss in the negotiations of reproductive powers. Under the loosened policy period, doctors were deprived of the power they owned before and their role became less significant as the implementation of the Social Maintenance Fee offered women birth quotas at the cost of financial loss.

Analyses of the in-depth interviews supplemented the causal link revealed by quantitative analyses, and presented the insiders' perspectives of the interactions among married individuals, birth control cadres, and local doctors. Under the loosened policy period, married women could legalize a birth at the cost of financial loss and reduce the risk of induced abortion. Local birth control cadres figured out a greater economic gain for themselves by collecting the fines and were no longer motivated to force women into induced abortion, therefore also reduced the risk of induced abortion for women. What the Actor-Network Theory prompted us to see was that all of the actors involved in the policy change had an intimate understanding of their powers, constraints, possible gains and losses in the stringent and loosened policy periods, and were responsive in adjusting their attitudes and actions in the face of different action contexts. In addition, married

individuals, birth control cadres and doctors were not only responsive actors, but also strategic actors in negotiating reproductive powers and space. In other words, they were actively shaping contexts for other agencies in the interactive processes, although their actions were constrained by external contexts such as laws.

Conclusion and Discussion

Using mixed methods, this study has demonstrated the effects of China's induced abortion policy on married women. Quantitative analyses showed a causal link between policy change and the decrease in induced abortion. Qualitative analyses revealed the insiders' perspectives, unpacked the "black box" of the causal link, and supplemented the quantitative analyses with empirical in-depth interview evidence. Results suggested that there exist a causal link between the stringency of the state's abortion policy and married women's induced abortion: Tightened abortion policy led to higher rates of induced abortion among married women. The in-depth interview data illustrated how abortion policy has shaped the choices married women have faced with an additional, unauthorized pregnancy. In the tightened policy period, married women were forced to abort an unauthorized pregnancy, while in the loosened policy period, married women could pay the fines to circumvent induced abortion and legalize unauthorized births.

What social mechanisms were behind the decline in the induced abortion rate in the loosened policy period? From qualitative interviews, it is suggested that two possible mechanisms have been contributing to this social process: the implementation of the Social Maintenance Fee and the discontinuation of using abortion rates for administrative evaluation. The former has offered an economic incentive for married women to legalize a birth in the loosened policy period, therefore reducing the risk of induced abortion. Furthermore, local birth control cadres have been incentivized by the economic benefits they gained from collecting the fines. Additionally, local birth control cadres were no longer motivated to rigorously implement induced abortion, since the abortion rate had been repealed as a component for their administrative evaluation. This also enabled women who could not afford to pay the fines to run away from local birth control inspection and keep their unauthorized children unregistered. This reduced their risk of having an induced abortion. Although married women were not able to achieve the optimal solution, which would have been to make reproductive decisions at their full discretion, the loosened policy may enable them to satisfy their birth preferences to a greater extent without induced abortion, resulting in a decrease in induced abortion.

Although married women have seemingly gained more agency in making reproductive decisions in the loosened policy period, their agency has not been a "utopia of a self-regulating market" (Polanyi 1944). Instead, it has

been limited by a set of contextual factors, including married women's economic capacity, and specific requirements from their working units and local governments. For example, the likelihood of paying the fines was lower for women of lower socioeconomic status (Chen 2011). Although this study did not analyze the social and psychological processes of married women in light of the changing abortion policies, it could be hypothesized that married women were consciously evaluating the constraints set by the state, internalizing the symbolic authority the state exerted, calculating the cost-effective trade-offs, and adjusting their strategies accordingly.

It is worth noting that the abortion policy was embedded in the umbrella of the one-child policy, and was used as a method of controlling population growth. The abortion policy shift was only a change in the means, rather than a change in the ends. The implementation of the Social Maintenance Fee should not mask the unchanged ultimate goal of the former abortion policy, which is to suppress population growth and maintain the status quo of the one-child policy. Therefore, the loosened abortion policies could be interpreted as an adjustment in the remedy the state has used to handle unauthorized pregnancies.

Furthermore, the state's power structure behind the technological adjustment has remained unchanged (Skocpol, Evans, and Rueschemeyer 1999). The state had always been the primary actor shaping abortion policy according to its own preferences. It was proactive in shaping societal reproductive preferences by offering new options. On the other hand, married women were subordinated and forced to sacrifice their own interests—either directly through mandatory induced abortion or indirectly by paying the fines. In the tightened policy period, state officials' main interest was in birth control, since a smaller population was believed to be an important factor in the state's desire to modernize. Meanwhile, many married women preferred to have several children, especially sons, as a form of security for old age (Wang 2012a). Since the women's preferences did not align with the state's goals, the state relied on its inherent power, and oversaw mandatory induced abortions (Nordlinger 1982).

Although it is beyond the scope of this study to disentangle the concrete historical contexts of the policy shift, it could be hypothesized that international censure from a human rights perspective, public dissatisfaction, the state's awareness of the threats of an aging society, and labor force shortages may have led the state to reduce the incidence of induced abortion. However, this does not mean that the state shares the same birth interest as married women, but only indicates that the state and married women are conflicting to a lesser extent. During the loosened policy period, the implementation of the Social Maintenance Fee was the process that the state used to bring about a shift in societal preferences. Married women resorted to paying the fines or to illegal tricks, such as keeping children unregistered rather than undergoing induced abortion. The alternative of the fines helped

align societal preferences with the state's preferences. Thus, the state began collecting fines instead of continuing a rigorous mandate for induced abortion, as was common during the tightened policy period. This abortion policy shift could be viewed as a refinement in the state's technocracy.

These results and discussions should be understood within the context of the limitations of this study. First, the lack of measurement for the stringency of the abortion policies was one of the limitations. Although the use of a set of proxy variables addressed this concern, it was only a proxy to the policy stringency, and could have led to biased estimates. Second, there could have existed confounders between the abortion policy and induced abortion among married women both before and after the policy change. Potential confounders such as fertility preference could have posed a threat to the validity to some of the statistical models. However, this study was unable to address such a concern due to the lack of such data in existing surveys. Future research could aim to collect and address possible confounders and incorporate them into statistical models. Meanwhile, further replication of findings from this study is warranted. Third, although the distinction between voluntary abortion and induced abortion was made possible due to the questionnaire design, the data relied on self-reporting and could incur social desirability bias. This could have been the result of cultural pressure and shame that the respondents may have felt when being interviewed. Thus, more culturally sensitive interview approaches may be needed, and triangulation of information would be helpful for future research. Last but not least, the PSM method only deals with selection on observables, but not selection on unobservable. Considering drastic social changes between the tightened and loosened policy periods, there might be significant differences in the unobservable.

Despite the limitations, this study sheds light on the dynamic relationship between the state's abortion policy and induced abortion among married women. The mixed methods employed in this study provide insight that neither quantitative nor qualitative methods could have done alone, and deepens our understanding of this dynamic relationship. Such a relationship is embedded within a complex and interactive social system, which involves the technological governance of population policy, married women's personal agency, and fertility preference and culture. In light of the "two-child policy" initiated in 2015, the findings in this study call for the examination of the dynamic relationship between the state's population policy and married women's reproductive health, to better facilitate the empowerment of women's reproductive rights and the transition of the state's role in service provision.

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Notes

1. The social maintenance fee is an administrative charge imposed on citizens who give birth to babies not in compliance with the provisions that compensate for the insufficient public funds for social causes. It aims to impose a necessary economic restriction on such citizens, to coordinate the sound use of natural resources and protect the environment. Hence, it is characterized by compensation and imposition.

2. Induced abortions per 1,000 women ages 15–49. The induced abortion rate excludes therapeutic abortions, which are usually performed for the sake of maternal health.

3. The Program of Action (“Cairo Program”) of the International Conference on Population and Development (ICPD) offered solutions to population-related social problems, and set limits on state population policies through its recognition of informed choice. As a member state in the ICPD, China pledged to initiate the informed choice policy. This meant that its population policies would empower women’s reproductive health rights by offering women access to voluntary decision making on fertility, contraception, and childbearing.

4. The Population and Family Planning Law 2001. Retrieved December 12, 2015 (<http://www.nhfpc.gov.cn/jtfzs/s7871/201307/fc35ec8425544c628a572e5b50815beb.shtml>).

5. The data used in this research are from the published secondary statistics. There is no information in the data sources that can be used to identify respondents, and human subject protection is not an issue here. Furthermore, as a state organization, the Chinese National Family Planning Commission has an Institutional Review Board to approve data collection related to human subjects. The above disclaimers also apply to the data from the National Family Planning and Reproductive Health Surveys in China (NFPRHS) used in this study (National Population and Family Planning Commission of P.R. China, and China Population and Development Research Centre 2013; Wang 2012b). While the 2006 survey may underrepresent unmarried women (Guo 2008), our analysis is done on married women. In addition, this dataset has been widely used by many studies (see, e.g., Wang 2008; Zhang 2008; Qin and Li 2009; Wu and Duan 2009; Yang 2011; Wang 2014a, 2014b; National Population and Reproductive Health Science Data Center 2016).

6. This data could possibly include a small quantity of voluntary abortions, both in the tightened and loosened policy periods. However, I would like to argue that voluntary abortions are still influenced by abortion policy to some extent since the birth quota was limited. Under the tightened policy, women had no other choice but to undergo enforced induced abortions if they had unauthorized pregnancies.

Due to the limited birth quota, some women with strong son preferences may voluntarily chose to have induced abortion if they did not already have a son, and the type-B ultrasound showed that the fetus was a female. Under the loosened policy, although to pay the fines was an option for those who could afford it, women without economic capacity may also choose voluntary abortion due to the limited birth quota. Such a mechanism was specific to China's context.

7. In this study, theoretical sampling was guided by behavior selection theory, focusing on the effect of policy on abortion behavior.

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