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Age at marriage and marital stability:

Evidence from China

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Age at marriage and marital stability: Evidence from China*

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Abstract

Many studies showed that marrying younger is associated with a higher risk of divorce. We investigate the causal effect of marrying at an earlier age on women's divorce risk. We exploit the introduction of the 1981 reform in China, which facilitated legal marriage for urban women younger than 25 years old, using the Chinese Census data. We show that the reform generated a kink in the mean age at marriage for women, which we use in a fuzzy regression kink design (RKD) to assess the causal effect of marrying younger on the probability of divorce. First, we confirm in our data the existence of a negative (in fact, a U-shaped) association between age at marriage and divorce, as commonly observed in previous studies from the USA. Then, we show that this association disappears in our analyses based on RKD. This finding suggests that the well-documented association between early marriage and divorce is in fact attributable to unobservable factors driving both marriage timing and the likelihood of divorce. We discuss the implications. *Keywords:* Age at marriage, divorce, legal age of marriage, China. *JEL codes:* J12.

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1 Introduction

Demographers have long observed that those who marry younger are overrepresented among the divorced in the USA (e.g. Monahan 1953; see Weed 1974 and Lee 1977 for reviews of the pre-1980s literature). Becker et al. (1977) have laid out theoretical micro-foundations in their seminal work for why an early age at marriage would lead to divorce. Since then, the negative association between the age at first marriage and divorce risk at the individual level has become one of the most studied empirical regularities (e.g. Booth and Edwards 1985, South and Spitze 1986, Teachman 2002, Goldin and Katz 2002, Lehrer 2008, and for reviews of recent studies, see also Amato 2010, Glenn et al. 2010, and Lehrer and Son 2017). The negative association is found to be consistent across cohorts and over time (Teachman, 2002), although it may be non-monotonic, and turn positive after a certain age, such as 30 (e.g. Booth and Edwards 1985; Lehrer 2008; Glenn et al. 2010; Lehrer and Chen 2013; Wolfinger 2015). The presence of a negative association at the individual level is also consistent with the argument that the changes in the average age drive the changes in the trends of divorce rates at the population level (e.g. Weed 1974; Goldstein 1999; Stevenson and Wolfers 2007; Rotz 2016; Lehrer and Son 2017; Cohen 2019).

Despite consistent findings of a negative association (at least until the age of 30), there is no conclusive evidence that marrying younger *causes* divorce. We know of only two studies that provide a causal assessment of this relationship with contradictory findings: Rotz (2016) and Bailey et al. (2021).[1] Rotz (2016) uses the reforms in the marriage-age laws across the USA as an exogenous source of an increase in teenage women's marriage age. She finds that increases in marriage age due to reforms in laws reduced their divorce probabilities.[2] Whereas Bailey et al. (2021) analyzed the marriages formed by men around

[1]There is another study written in Mandarin but we could not find an English version of the paper. Based on the abstract in English, Zhang (2012) uses the same reform and finds that delaying age at marriage by 1 year increases the probability of divorce by 3 to 6 percentage points. To overcome identification concerns, the author uses a regression discontinuity design comparing those marrying just before and after the approval of the law. The main concern with this design is the possibility that the couples might self-select at both sides of the cut-off. Whether they decide to marry just before or after the date of approval can arguably not be considered random, violating the identification condition of RDDs.

[2]However, the changes in these laws provide a variation in marriage age only for younger teenagers, a tiny fraction of whom married anyway.

age 19 in 1965 to avoid the Vietnam draft. They show that many men, who rushed to get married in response to an Executive Order by President Johnson on the 26th of August 1965, which eliminated the lower draft priority for men married after this day, did not experience a higher risk of divorce. Given these contradictory findings, the need for further evidence persists.

We provide new causal evidence on the relationship between marrying younger and divorce risk for women outside the USA. We exploit the introduction of a reform in China (in 1981), which made marrying considerably easier for urban women younger than 25. Unlike the laws that increased (or established anew) the minimum age for teen marriage in certain states in the USA, the Chinese reform reduced the marriage age. We argue that this reform provides a better quasi-natural experiment to understand the effects of "marrying younger" on divorce, not least because marriages are considerably more common in these age groups in most countries.

The causal prediction that the earlier the marriage, the more unstable it will be, has been commonly made for all ages beyond teen years in many previous studies, including in Rotz (2016), even though there is no causal evidence for it. As a result, there is abundant advice against marrying younger in the popular press[3] focusing on young adulthood broadly, making the question policy relevant. While this advice is well-justified for teenage marriages for their far more critical negative consequences than divorce, such as adverse physical health, poverty, child mortality and crime (see Jensen and Thornton 2003, Field and Ambrus 2008, Garcia-Hombrados 2017 for low-middle income countries, and see Hunt 2006, Bharadwaj 2015, and Dahl 2010 for the USA), we show that it lacks empirical support for young adults beyond teen years.

Our causal identification relies on a novel method: a fuzzy regression kink design (RKD) applied to Chinese Census Data from 2000. We take advantage of the kink generated by the Chinese reform[4] in the mean age of marriage for women affected by the

[3]For example, a quick google search returns numerous articles in popular press explicitly focusing on whether marrying young leads to divorce, for example, Daily Telegraph (the 20th of November 2016), The Guardian (the 9th of December 2014), Cosmopolitan (the 8th of August 2017), Teen Vogue (the 27th of July 2018) and BBC (the 28th of November 2018).

[4]The kink in average age at marriage for women is also shown earlier by Feng and Quanhe (1996) using a different dataset.

reform to assess the causal effect of the age of their first marriage on the probability of divorce over the next 20 years.

We begin our analysis by showing that the well-established negative association between the age of first marriage (until the age of 30) and divorce in the USA is also observed in urban China. To provide comparison and benchmark, we use the same age groups as defined in the previous research (e.g. Lehrer 2008, Lehrer and Chen 2013). We demonstrate that the association is, in fact, U-shaped in the Chinese context as well, which is consistent with a subset of associational studies from the USA (e.g. Booth and Edwards 1985; Lehrer 2008; Glenn et al. 2010; Lehrer and Chen 2013; Wolfinger 2015). More specifically, we show that throughout the 20s, the age of marriage is linearly and negatively associated with divorce probability. The negative association turns positive (and statistically significant) beyond age 30 also in China.

After replicating and confirming the US findings in the Chinese context, we move beyond associations and implement a RKD to estimate the causal effect of marrying younger on divorce. We show that the previous association vanishes altogether in our causal design. Moreover, our finding of no causal effect is robust to several sensitivity and specification checks. This suggests that the unobserved factors drive the well-documented association between the age of first marriage and the likelihood of subsequent divorce. Our findings are consistent with those of Bailey et al. (2021), who also find no effect of marrying younger on later divorce among American men who married younger to avoid the Vietnam draft.

By focusing on China, we contribute to both substantive and broader literature that aims to understand the determinants of divorce in China (which is scarce) and the literature on the long-term effects of marrying younger in general. However, we focus on urban China rather than rural China mainly because the laws governing marriage age were more strictly enforced in urban areas in China before the reform (although we also report findings on rural China in Appendix). Moreover, the laws allowed different marriage age limits for men and women in urban than in rural China. However, urban China is particularly a useful context for other reasons, too. First, urban China's demographic characteristics have been more similar to those in advanced economies throughout our

observation period than in rural China. For example, in urban China, divorce rates have been higher than many European countries and closer to those of the USA throughout the period. However, similar to many European countries, these rates have been increasing over the last few decades (whereas the rates have gradually declined in the USA).

A lack of causal effect of marrying younger on divorce probability at the individual level does not necessarily rule out the possibility that an increased age at marriage leads to decreases in divorce rates at the population level. Put differently, later marriages may still lead to less divorce even if there is no causal effect. This may happen because a later marriage reduces exposure to risk of divorce (shortening the period in which a divorce can happen), and therefore, lifetime risk of divorce decreases. Theoretically, if a substantial number of people marry at later ages, the divorce rate will go down, even if age has no causal effect on an individual's likelihood of divorce. The relationship between age at marriage and trends in divorce rates is outside the scope of this paper

In the next section, we outline the theoretical arguments for why marrying younger might lead to divorce at the individual level and findings of the mechanisms in the most recent empirical studies. We summarize the mechanisms mentioned in the previous literature to inform and illustrate how could one think about observed and unobserved factors driving this association. We do not attempt to test any mechanisms since we find no causal relationship between age at marriage and divorce at the individual level. The following section (2.2) provides background information on the Chinese reform of marriage-age law and its relevant features for our study design and the extent of divorce in China. In Section 4, we explain how a fuzzy RKD works in our setting. Specifically, we present evidence using our data that four essential conditions are met in our context to implement the RKD reliably. We report our robust null findings in Section 5, followed by further sensitivity checks. We provide a discussion of our results, and we conclude.

2 Background

2.1 Age at Marriage and Divorce Relationship

Why would an early age at marriage lead to a higher divorce risk for an individual? The mechanisms discussed in the previous literature are mostly based on Becker et al. (1977)[5] theoretical work on the causes of divorce. They are explained within the framework of optimal matching in the marriage market. In short, the authors argue that a couple's match quality increases with age. This is because the degree of optimism bias in expectations often reduces with age, leading individuals to make more realistic decisions when sorting into partnerships. Consequently, better quality matches in couples result in more stable marriages. Oppenheimer (1988), building on this idea, suggested that marriages at later ages benefit from a maturity effect. Mature individuals may better evaluate their personality and preferences and their partners' personality traits and future trajectory (Lehrer, 2008). As a result, the mismatch in expectations is less likely to occur as individuals age, leading to more stable marriages. The maturation thesis considers psychological maturation as well as the development of relationship skills and earnings ability (Glenn et al., 2010; Lambert, 2013). The maturity effect is generally viewed as *the direct effect of age* on marital instability (e.g. Lehrer 2008).

While the maturity effect improves match quality, some sociologists argue that it may lead to young adults who get used to living alone becoming "set in their ways" (Glenn et al., 2010). In other words, a delay in marriage and maturing alone might not mean better relationship skills; instead, they may lead to a loss of an opportunity for "coordinated development" among partners (Glenn et al., 2010). In practice, "maturity" is an unobserved variable, which is assumed to increase with age. However, maturation, defined as the process of development of relationship skills, earnings instability, etc., may not simply linearly increase with age but with experience. Fallesen and Breen (2016) argue that no matter how temporary they are, the vagaries of life experienced jointly by partners accelerate learning about each other's characteristics and the marriage. They show

[5] Albeit in a synthesized way, the summary in this paragraph is based on Becker et al. (1977) and Oppenheimer (1988), which are discussed in Lehrer (2008), Lehrer and Chen (2013) and Lehrer and Son (2017)

that such learning in some marriages may cause disappointment and divorce, while in others a coordinated development. In sum, maturation might be contingent on several structural and individual factors (and fixed personality traits), which collectively shape individuals' experiences and their maturation in systematic and unobserved ways. As a result, the sign of the effect of maturation on divorce risk is unclear.

Lehrer and her colleagues, in a series of recent empirical studies (e.g. Lehrer 2008; Lehrer and Chen 2013; Lehrer and Son 2017), argue that postponing marriage may affect marital stability through other *indirect channels*. These indirect channels go through the factors related to couples' characteristics, affecting match quality and behavior as couples age. The indirect channels may also go through other external factors that shape age-specific marriage markets. All these factors may stabilize or destabilize marriages, and the overall sign of influence is ambiguous. For example, women who marry later are more likely to complete college education which is a likely *stabilizing* factor (Lehrer and Son, 2017). College education also directly affects married women's match quality via its effect on the available partner pool (given assortative mating) in the marriage market. In contrast, a delay in marriage can also be correlated with increased exposure to other divorce risk factors, such as an increased likelihood of entering a marriage with a child from a previous union, which is a *destabilizing* factor (Lehrer and Chen, 2013). Lehrer (2008) notes in the context of previous associations that if these indirect factors are not controlled for, age at marriage will capture their effects.

Rotz (2016) presents a model which predicts that *any factor* that increases earning capacity of women; such as female labor force participation, decreases in household specialization, or increases in the returns to female education, will lead to delay in marriage, and thus, will lead to lower divorce probabilities. The underlying assumption is the same: Better earning women will "become pickier about the man they will marry and are less likely to choose to enter a marriage, but continue to search for a better spouse" (p 989). Namely, a delay is equated to the length of the search, resulting in a better match. At the same time, the length of the search may also be correlated with (or subsidized by) available economic resources (Oppenheimer and Lew, 1995). In a nutshell, increases in human capital and earnings capacity, be it by acquiring further experience in the labor market

or obtaining further education, may stabilize marriages because they delay marriages, which is assumed to improve match quality via increasing search length.

Goldin and Katz (2002) considered similar channels in their seminal study on the effects of expansion in reproduction technology on women's outcomes, including divorce. To their surprise, the authors found that the pill led to a decreased risk of dissolution by possibly *delaying* women's entry into marriage. They explain that a delay in marriage due to pill improved matches in the marriage market (because the pill decreases the relative cost of marital search while being single). Any factor contributing to search length needs to be evaluated against how it affects the marriage market. For example, college education has been suggested to improve match quality and reduce divorce risk (Härkönen and Dronkers, 2006; Mclanahan and Jacobsen, 2015). However, in the presence of educational assortative mating, further education might reduce the pool of available partners for the highly educated individuals, especially beyond a certain age, which then reduces match quality. Likewise, a destabilizing factor for early marriages could be the easy availability of alternatives and singles in the marriage market (Booth and Edwards, 1985; Lampard, 2013). This goes both ways, however. Becker et al. (1977) recognize that the available pool of marriable partners may also shrink beyond a certain age, such as the 30s, with possibly an adverse effect on the match quality. The crucial implication of considering age-specific marriage markets is a non-monotonic relationship between age at marriage and divorce risk. There is now growing empirical evidence showing that the association between age at first marriage and divorce is, in fact, U-shaped, i.e., negative until the end of 20s but turning positive after early 30s (Booth and Edwards, 1985; Lehrer, 2008; Glenn et al., 2010; Lehrer and Chen, 2013; Wolfinger, 2015).

The maturation hypothesis implies that any U-shaped association should be different across cohorts, samples or context. Because, if maturity is also understood as economic maturity, the increase in insecure jobs, short and fixed-term contracts, etc., should cause delays in the economic maturity of young adults, spreading it throughout their 20s. In other words, variation in labor market conditions implies differences in the association's sign and size across cohorts and contexts. However, Teachman (2002) finds that this is not the case. The association between marriage and divorce has been constant across cohorts.

Lehrer (2008) and Cohen (2019) both find very similar U-shaped associations between age at marriage and divorce using different datasets and samples, suggesting little change.

Wolfinger (2015) suggests that environmental support might be relevant for improving stability. For instance, parents and friends might react differently to marriages formed in early adulthood than marriages formed later. Such support, an unobserved factor, might be correlated with age and risk of divorce. Individuals who marry younger might be feeling more under pressure if they are breaking social norms about the ideal age of marriage, which may have shifted culturally over time (Billari et al., 2003). In sum, the context, norms, and marriage market correlate with age and contribute to indirect channels through which age at marriage could affect divorce probability.

Related to above, Lehrer and Son (2017) investigate whether the U-shape association differs for different ethnic groups in the USA because different ethnic groups may have different cultural norms and marriage markets. They find that the age at which the negative association turns positive varies by ethnicity. Lampard (2013) also finds a U-shaped association between age at marriage and divorce in the United Kingdom, which is somewhat similar to the US. There are very few studies documenting the nature of this relationship outside these country contexts. In this paper, we provide another data point from China.

Earlier and later marriages are also likely to be different in terms of "marriage quality". Rotz (2016) and Wolfinger (2015) analyze cross-sectional data from NSFH in the USA to explore the differences between early or later marriages. Rotz (2016) find that increases in women's age at marriage do not increase their husbands' reported happiness with marriage. However, she shows that late marriages exhibit characteristics attributed to better marriages. For example, couples who marry later are more likely to spend quality time together (though they have a lower frequency of sex, an indicator for low marital quality).

Several studies have highlighted the limited attention to causal mechanisms (Lampard, 2013). For example, Glenn et al. (2010) described the literature as including "fragments of theoretical arguments". They suggested that the effect of age at marriage on marital outcomes could be due to selection. The differences in marriage quality may be

due to unobserved differences between people who marry earlier and those who marry later. Consequently, these differences may produce a correlation between age at marriage and divorce risk. For example, personality traits such as "impatience" or "impulsiveness" may well destabilize marriages of people who possess them; simultaneously, they may drive these people to marry younger (Glenn et al., 2010). While it is plausible to argue that part of these traits may change with age, it is also safe to assume that between-individual variation in these traits at a given age is much larger than over time variation within an individual (Stillman and Velamuri, 2020). Moreover, individuals may also match on these personality traits, which increases the likelihood for the marriages formed at younger ages to be different from those formed later. Since controlling for such unobserved characteristics is not feasible, the need to find an exogenous source of variation in age at marriage dominates in practice.

In the next section, we outline details of the Chinese reform, which provides a valuable exogenous source of variation in age at marriage for our study.

2.2 Marriage and Marriage-Age Regulations in China

Institutional Background and the 1981 Reform

One of the People's Republic of China's first reforms around the family domain was civil marriage regulation. The New Marriage Law came into force in May 1950, just a few months after the new Chinese state's birth in October 1949. The law was aimed at reducing sex discrimination and eradicating arranged marriages. It also set the legal age of marriage at 18 for women and 20 for men.

While the New Marriage Law remained in force throughout the 1970s, concerned with the high fertility rates and the young mean age of marriage of Chinese women, the Chinese government started promoting later marriages more explicitly between 1964 and 1977 (Zhangling, 1983). "Lateness" for urban areas was commonly defined as those marriages in which the bride was 25 or older and the groom 28 or older and for rural areas as those in which the bride was 23 or older and the groom 25 or older. As a part of the

promotion strategy, the funding that local administrative bodies[6] received was made contingent on, among other factors, the percentage of "late marriages" in their jurisdiction. Local administrative bodies responded to this incentive by developing bureaucratic hurdles and rules that made it difficult for individuals to marry below the specified ages, ultimately raising the mean age at marriage. Zhangling (1983) reports that these efforts were rather "successful". Before the 1960s the average marriage age for the rural female was 18, while for the urban female it was 20; but now the ages have changed to 23 for the rural and 25 for the urban female. Tien (1983) shows that some districts required permissions to marry from the groom's and bride's respective employers. The permissions were only granted when bride and groom complied with the "late marriage" age requirements. Tien (1983) also argues that in order to promote late marriages, certifying "single" status was required for admission (and continuance) in higher education institutions and participation in urban skilled worker apprentice programs.

In sum, although there was not an explicit ban on marrying younger than 25, it was made costly throughout this period. Nevertheless, despite these bureaucratic obstacles, compliance was imperfect. Our analysis of the census data, in the next section, suggests that many young couples were still getting married without fulfilling the late marriage requirements. This is expected as late marriage in in direct conflict with old Chinese traditions Zhangling (1983).

The country-wide change in the legal framework for marriage age came at the beginning of the 1980s. The Chinese government announced a reform of the marriage regulation, which came into force on the 1st of January of 1981. The new law set the legal age of marriage for women at 20 in urban and rural areas, overruling the 1950 law and all the local norms that established additional bureaucratic requirements for marriage. The new law made marrying much easier for women at least 20 years old, but younger than 25 in urban areas, and 23 in rural areas. Following the introduction of the law, Tien (1983) estimates that at least 14 million young couples got married in 1981, more than twice the number of marriages that occurred the year before.

[6]Specifically, local birth planning units.

Did the new law reduce average age at marriage?

Suppose the 1981 reform had effectively removed the restrictions imposed by local administrative bodies to prevent marriages below the age of 25 and a sufficient number of urban couples were willing to marry at a younger age. In that case, the law may generate a kink in the mean age at marriage (for each cohort) for urban women younger than 25 when the law was introduced. This would happen for two key reasons: First, urban women who were older than 25 when the new law was introduced already faced legal constraints to marry until the age of 25, and the introduction of the new law did not affect them. However, urban women between ages 20 and 25 years old when the new law came into force faced administrative hurdles only until they reached their age when the law was introduced. For example, an urban woman who was 24 years and six months old when the law was introduced faced constraints to marry legally until she was 24 and six months. Within the age range of 20 to 25, urban women who were one month younger when the 1981 law was introduced, could now marry without facing administrative hurdles one month younger. This would likely result in a kink in the mean age of marriage faced by women living in urban areas slightly younger than 25 when the law was introduced.

A key question is whether the introduction of the new law reduced the average age at marriage, generating the kink explained above, given the *imperfect compliance* with the late marriage regulations before the reform. We investigate this using data from the 2000 Chinese census. Figure 1 reports the evolution of the mean age at marriage for women by their age in January 1981 in urban and rural China. The top graph in the figure reveals that in urban areas, the mean age at marriage started decreasing for women younger than 25, for whom the reform made marriage below the age of 25 considerably easier. However, the law's effect on marriage age is weaker in rural areas, where the drop in the mean age at marriage for women affected by the law (i.e. younger than 23) has been smaller. The patterns we describe here are very similar and consistent with the estimation by Feng and Quanhe (1996) (see their figure1) based on a different dataset: "Two-per-Thousand Fertility Survey of China 1988". They also conclude that the policies pre-1981 were effective in raising the marriage age, and attribute the decline in the marriage age

after 1981 to the relaxation permitted by the 1980 New Marriage Law (p.304).

The graphs in Figure 1 deserves two additional comments. First, an important share of urban women aged above 25 when the 1981 Marriage Law was introduced, reported age of marriage younger than 25. This indicates that non-compliance with the local marriage regulations was non-negligible, which may threaten the relevance condition of our identification strategy. Non-compliance was more severe in rural China than in urban China.[7] The top graph in Figure 1 shows a downward slope for those older than 25, indicating upward trends of mean age at marriage for each birth cohort until 1981. This may happen either because non-compliance has gradually decreased over time throughout the 1970s or because there was a secular increase in marriage age until 1981. Second, the reduction in the mean age at marriage over age-cohorts could have resulted from a trend unrelated to the law or other interventions implemented around the same time. We examine and rule out this hypothesis in sections 4 and 5.

2.3 Marriage and Divorce in China

A crucial issue to consider in the Chinese context is whether cohabitation (as an alternative or pre-cursor to marriage) and divorce have been common in the first place. Yu and Xie (2015) and Ma et al. (2018) argue that during the period of interest, (pre-marital) cohabitation in China was sparse and heavily stigmatized. Using the China Family Panel Studies (CFPS) survey, Ma et al. (2018) show that the percentage of women who cohabited briefly before first marriage was 1.4 for women that married in the 1970s; 4.1 for women that married in the 1980s. These figures illustrate that cohabitation was less common in China than in the USA but similar to some of the European countries, such as just below the rate in the UK in that period (Berrington et al., 2015).

Unilateral divorce in the People's Republic of China was also implemented in the 1950 Marriage Law (He, 2009; Huang, 2005). The law gave local courts a significant level of discretion to decide on whether or not to grant divorce (He, 2009). The regulation of divorce did not change much over the following decades, and the most dramatic change has been

[7] We use the urban status as defined in the Chinese Census.

the facilitation of unilateral divorce in 1989 after the promulgation of new divorce guidelines by the Supreme People's Courts. These guidelines explicitly allowed divorce under fourteen situations, although judges were still encouraged to mediate and seek reconciliation. These principles were then consolidated in the 2000 Chinese Marriage Law, which further simplified unilateral divorce as well as procedures for obtaining divorce.

A number of previous studies reported divorce rates and trends in China covering the period of 1980s and 1990s. Even though the estimates vary, they conclude that divorce rates have gradually increased throughout our observation window. For example, crude divorce rate has increased from 0.38 in 1981 to 0.95 in 1998 (Wang, 2001). However, there were considerable regional and ethnic differences. Yi and Deqing (2000) report that Xianjiang region had around 10 times higher divorce rates than national average between 1980s and 1990s. Yi and Deqing (2000) also showed that divorce has been less common in Han ethnic group than other groups and divorce rates were lowest in urban areas along the east coast, and highest in the less developed provinces in northeast and northwest China although urbanization might have increased the divorce rates later in the 1990s (Chen et al., 2021). The information on the year of divorce is not provided in the 2000 Census Data, however, we illustrate in Appendix Figure A1, the probability of ever divorce by year of marriage in our sample for reference. The figure suggests the probability of being ever divorced in 2000 remained relatively stable above 4% for cohorts married between 1960s and late 1980s.

3 Data

We use data from the 2000 Chinese Census, which includes information at the individual level from a random sample of Chinese households, equivalent to the 1% population. The data were collected more than 19 years after introducing the 1981 marriage law, and they are publicly available at IPUMS International website. The Chinese census provides us with crucial retrospective information for our analyses such as the age of first marriage in years, in addition to current marital status. Since the dataset does not include information on the timing at divorce, we use the measure "ever divorced" at the time of the survey (in

2000) as our outcome of interest. We excluded widows and women who never married from our analytical sample. As a robustness check, we re-estimate the results removing from the sample also remarried women. The results, reported in Table A3, largely confirm the main conclusions of the study.

The Chinese data is very appropriate for our empirical strategy as the Regression Kink Design (RKD), which we describe in the next section, requires a considerable sample size. Our main analysis is focused on women from urban areas, where the enforcement of the law was more vigorous. In total, we use information from 824,590 women living in urban areas and aged 16 or older. The prevalence of divorce among these women was 4.8%, and their mean age at marriage, which ranges between 13 and 85, was 22.6. It is important to note that RKD designs do not use all observations in the estimation, but only those women with a date of birth that falls within the bandwidth used in the estimation. To facilitate the interpretation of the results, every specification reports information on the mean of the dependent variable for women used in the estimation.

Although the main estimation is conducted using only women from urban areas, where the law's effect on the age of marriage was more substantial, we replicate the analysis for rural Chinese women in Appendix B.[8] This analysis relies on a larger sample of women, including 2,536,732 ever-married women. The mean age at marriage among them is 21.1, and the prevalence of divorce is 3.7%, slightly lower than in urban areas.

The analysis focuses on examining the effect of the age at marriage on divorce for women because the reform did not generate a sufficiently sharp kink on the age at marriage for men, as can be appreciated in Figure A2 in the Appendix. The lack of a strong kink in both rural and urban areas prevents the estimation of the effect of age at marriage on divorce for men.

[8]While we only observe whether the women live in a rural or urban area at the time of the survey rather than their birthplace, the strict Hukou policy[9] that was in place limited both rural to urban and urban to rural migration in China. Furthermore, the analysis conducted in the Robustness Checks rules out the hypothesis that women migrate in or out of urban areas in response to the law, ruling out the possibility that internal migration could be affecting our results.

4 Empirical Strategy

Our empirical strategy has two components: First, we replicate analyses in previous research and demonstrate that a strong U-shaped association between marriage age and divorce risk is present in urban China (a negative association throughout the 20s, which turns positive after 30s). We start reporting these correlational analyses using OLS specifications in the next section.

The second component addresses the main challenge of estimating the causal effect of the age at marriage on divorce, which is overcoming the potential endogeneity caused by unobservable factors such as values, expectations or other characteristics such as impatience or impulsivity, which might correlate with both marrying earlier and divorce. These factors could drive the statistical association between age at marriage and divorce. To overcome endogeneity concerns, we follow Card et al. (2016) and use a fuzzy regression kink design (RKD) exploiting the kink in the mean age at marriage for urban women who were younger than 25 when the 1981 law came into force to estimate the causal effect of the age at marriage on the probability of ever divorcing.

This approach's logic resembles a fuzzy regression discontinuity design, except that the fuzzy RKD[10] exploits *a change in the slope of the outcome variable* at the cut-off rather than a *change on its level*. In our case, the change in the slope of the mean marriage age for women aged 25 or younger in January 1981. If the probability of divorce also exhibits a kink at the same point, then the causal impact is found by dividing the change in slope for the probability of divorce by the change in slope for marriage age.

The effect of interest is estimated through a two-stage process. First, we estimate the following regression:

$$Age\ at\ Marriage_i = \beta_0 F(Age\ at\ Policy_i) + \beta_1 Policy_i \times g(Age\ at\ Policy_i) + \mu_i \tag{4.1}$$

[10]Because some women got married before meeting the marriage age set in the law both before and after the reduction in the legal age of marriage, we use a fuzzy RKD, which uses the change in the slope in age at marriage at the cut-off as an instrumental variable for age at marriage.

where a woman's age at first marriage in years is the dependent variable, *F(Age at policy)* and *g(Age at policy)* are smooth functions of the age of the woman in months in January 1981, which is the forcing variable in our analysis. *Policy* is a dummy variable equal to one if the woman is younger than 25 years old.

We then use the predicted *Age at Marriage* obtained from the first stage regression to estimate the causal effect of age at marriage on the probability of ever divorcing.

$$Divorce_i = \alpha_1 Age\ at\ \widehat{Marriage}_i + \alpha_2 F(Age\ at\ Policy_i) + \mu_i \tag{4.2}$$

Regressions are estimated using non-parametric regressions and triangular kernel functions to construct the local polynomial estimators[11] and the optimal bandwidths described in Calonico et al. (2014). Standard errors are clustered at the year-month cohort as recommended by Lee and Lemieux (2010) for designs with a discrete running variable. The estimations are conducted using the Stata command RDROBUST, developed in Calonico et al. (2014). In the Robustness Checks section, we examine the results' sensitivity to parametric methods with different bandwidths and polynomial functions for the forcing variable. We show that our results are robust to such variations in estimation specification.

The validity of our fuzzy RKD strategy to identify the causal effect of the age at marriage on the probability of divorce relies on *four* identification conditions:

First, the kink caused by the introduction of the law should be statistically meaningful. More specifically, the parameter β_0 in the first stage regression, which measures the size of the kink in the age at marriage, should be highly statistically significant to avoid a problem of weak instruments (Bound et al., 1995). The threshold typically used in the literature is a t-statistic equal or larger than 3.33 for the instrumental variable in the first stage. The fulfillment of this relevance condition is empirically tested in the next section, where we show that the parameter measuring the kink is statistically significant at 1% in all specifications and satisfies the relevance threshold in most of them.

Second, the slope of divorce determinants unaffected by the new marriage law should

[11] Following Calonico et al. (2014), the conventional estimations used local linear regressions while the bias-corrected and robust estimations used in local quadratic regressions.

change smoothly at the cut-off. In order to test this condition, we examine the existence of kinks at the cut-off for four variables that were plausibly unaffected by the change in age at marriage: the probability of being from the Han ethnic group (the prevalent ethnic group in China), the probability of finishing primary education, the probability of living in Beijing and the probability of being literate. Although the age at marriage could eventually affect educational outcomes, it is unlikely that a policy that facilitates marriage from the age of 20 could affect primary education or literacy, outcomes that are typically achieved earlier in life. Although the 2000 Chinese census also includes basic information on labor force participation and other demographic characteristics, the placebo variables listed above are the only ones we can confidently claim remain unaffected by the marriage regulation change.

The results of this placebo analysis are reported in Table 1. The second stage regressions' coefficients are overall small in magnitude and statistically indistinguishable from 0 at conventional confidence levels, indicating no kinks at the cut-off and reassuring the fulfillment of this assumption. The lack of kinks for these variables is also evident in Figure 2. We would like to iterate that this placebo analysis constitutes necessary checks before implementing a sound RKD here, rather than a standard robustness check for our estimated causal effect. Therefore, we report the findings of our analyses before we report our main results in Section 5.

Third, the age reported by the women in the census should not be systematically manipulated in response to the law. Although the fact that the census information was collected 20 years after the law's approval diminishes this concern, we test further this hypothesis by examining the existence of kinks in the frequency of the forcing variable at the cut-off. The results of this test are reported graphically in Figure 3 and in Table A1 in Appendix. They reveal no kink in the frequency of the forcing variable at the cut-off, reassuring us concerning the hypothesis of no manipulation in the women's reported age.

The fourth identification condition of our design is that other interventions or events are not driving the change in the slope of the age at marriage and/or divorce at the cut-off. Although a broad set of family policies were introduced by the Chinese government around the same time potentially affecting age at marriage and divorce (e.g. the One-

child Policy in 1979), these policies were likely to affect women similarly at both sides of the cut-off by a few months, and therefore are unlikely to drive the change in the slope that is used for the identification of the effect of interest in this study. Another policy implemented by the Chinese government that could have affected age at marriage was the Sent-Down youth, which started in the 1950's and lasted until 1980. Through this policy, many youth urban individuals were sent to rural areas, although many of which returned to urban areas after a certain time. Because marrying in rural areas would make the re-ubication in urban areas more difficult for these individuals, these policies could have resulted in a higher age at marriage. While we cannot rule out this possibility, this would only confound the outcome of interest in the unlikely event that the Sent-Down youth affected differently women just below and above the age of 25 in January 1980. The lack of discontinuity in the density of the forcing variable revealed in Figure 3 reassures the hypothesis that this policy is unlikely to affect differently the probability of divorce and the age at marriage of women at both sides of the cut-off.

Finally, although the analysis is focused on urban areas, the 1981 law also facilitated young marriage in rural China. The main reason to restrict the analysis to urban areas is that the kink around the cut-off in terms of the age at marriage is weaker in rural areas. The lack of a sufficiently strong effect of the law on the age at marriage can lead to a problem of weak instruments and would invalidate the analysis on the estimation of the causal effect of age at marriage on divorce. Two reasons can explain a weaker kink around the cut-off in rural China. First, the state's capacity to enforce the new marriage law or the previous measures aimed at hindering early marriage might be weaker in rural areas. Second, the measures aimed to prevent early marriage that were operating before introducing the law targeted women younger than 23 in rural areas and younger than 25 in urban areas. Thus, even if the level of enforcement is the same in rural and urban areas, the magnitude of the effect on the age at marriage is expected to be smaller in rural areas.

Nonetheless, we also analyze rural areas and report the results in Appendix B. The direction and size of the coefficients and the existence of a weak kink around the cut-off displayed in figure B1 are consistent with the null effect of age at marriage on divorce observed for urban areas. However, the lack of statistical significance of the kink in the

age at marriage around the cut-off prevents us from reaching conclusions on the effect of age at marriage on divorce using the rural sample.

5 Results

We start by examining the association between age at marriage and the probability of ever divorced for women living in urban areas. The regression includes a vector of years-since-marriage dummies, a dummy variable indicating whether the woman belonged to the Han ethnic group and a variable indicating woman's age at the survey. In line with previous studies, the results reported in Table 2 suggest that the association between age at marriage and the probability of being ever-divorced for women in urban areas follows a U shape. Women marrying within the age range 25-29 are those with the lowest prevalence of divorce, while the probability of divorce is higher for women marrying in their 30's or early 20's.

We now assess the statistical association between the age at marriage and the probability of ever divorced restricting the analysis to women married when they have an age between 20 and 25. This is the age range of interest in this study because the 1981 law induced a change in the age at marriage within this age range and the parameter of interest in the fuzzy RKD yields the causal effect of the change in the age at marriage for women that advanced their marriage in response to the law. The naïve correlation between the age at marriage and the probability of divorce using this restricted sample are reported in column 2 of Table 2. The table shows that, among these women, marrying one year older is associated with a probability of divorce 0.5 percentage points lower (mean value 4.5 percentage points). While the magnitude is small, the coefficient is statistically significant at the 5% significance level. However, this negative association should not be interpreted as the causal effect of delaying marriage on divorce because the association could be driven by unobservable personality treats that might drive both divorce risk and marrying younger.

Our RKD analyses provide evidence about the causal effect of delaying marriage on divorce. The results of the first stage regressions measuring the effect of the law on the age

at marriage estimated using non-parametric methods are reported in columns 1, 3 and 5 of Table 3. They show that, regardless of the bandwidth and the estimation procedure used, the coefficient measuring the kink at the cut-off is relevant and statistically significant at conventional confidence levels for women in urban China. The results, therefore, confirm that the law generated a kink in the mean age at marriage for women who were younger than 25 when the law was introduced, and this effect satisfies the relevance condition when estimated using the conventional and the bias-corrected procedure, validating the estimation of the second-stage regression. The kink's existence in the age of marriage in urban China is also evident in Figures 1 and A3 using quadratic and linear polynomial functions for the forcing variable. The kink's existence (for women) is also visible in an earlier study by Feng and Quanhe (1996) (see their figure1) who used a different independent dataset: "Two-per-Thousand Fertility Survey of China 1988".

The estimates of the second stage equations using non-parametric methods are reported in columns 2, 4 and 6 of Table 3 and graphically in Figures 4 and A3 using quadratic and linear polynomial functions for the forcing variable. The coefficient measuring the causal effect of delaying in one year the age at marriage on the probability of ever divorce is consistently small and statistically indistinguishable from zero at conventional confidence levels. The point estimate in our conventional RKD estimation shows that an increase in one year in the age at marriage increases the probability of divorce by 0.33 percentage points out of an average of 6.16 percent. This coefficient is also smaller than those estimated in the naïve correlation and has the opposite sign. While the magnitude of the RKD estimates varies across estimation methods and bandwidths, the coefficient remains statistically indistinguishable from 0 at conventional confidence levels. Put differently, these findings suggest that the causal effect of advancing marriage on the probability of divorce is close to a precise 0. Furthermore, the results show that the positive statistical association between early age at marriage and divorce unanimously found in previous studies could result from unobservable variables affecting both ages at marriage and risk of divorce.

6 Robustness Checks

We first examine the robustness of the results to the use of parametric methods with different functions and bandwidths. Following Gelman and Imbens (2019) that discourage the use of polynomial functions of order larger than 2 for the forcing variable, we estimate the results using polynomial functions of order 1 and 2 and bandwidths equal to the optimal bandwidths as defined in Calonico et al. (2014), and alternative bandwidths equal to 1.5 and 0.75 the optimal bandwidth.

The results of these analyses are reported in Table 4. In line with the non-parametric analysis results, the effect of the age at marriage on the probability of ever divorced estimated in this robustness exercise is overall small and statistically insignificant. Only when we perform the extreme test of using an overly large bandwidth equal to 1.5 the optimal bandwidth combined with a linear polynomial -arguably unable to capture the evolution of age accurately at marriage for cohorts born over 8 years- the coefficient measuring the kink is statistically significant. When this extreme test is implemented, the coefficient measuring the effect of age at marriage, between the ages 20 and 25 on divorce probability is positive, which is noisy and against any theoretical expectation on the relation between age at marriage and probability of divorce. This is reassuring that the positive coefficient in this robustness exercise is unlikely to threaten our main conclusions.

We also explore whether the results could be driven by a selective migration in and out of urban places in response to the 1981 Marriage Law's introduction. While this is unlikely because the strict Hukou policy that was in force at the time of the law made rural to urban and urban to rural migration very difficult, we test this hypothesis empirically through examining the existence of kinks in the percentage of the urban population. The results reported in Table A2 and Figure A5 in Appendix show that neither the level nor the slope of the percentage of urban population changed at the cut-off. The latter result reveals that individuals that were more affected by the law did not migrate in or out of urban areas, ruling out the hypothesis that migration in response to the law could confound our estimates of interest.

7 Discussion and Conclusions

In this paper, we revisit the relationship between age at marriage and divorce. Many studies have reported that they are negatively associated at the individual level. A subset of these studies argued that the negative association only persists up to the age of 30. Beyond age 30, the association between age at first marriage and divorce turns positive, essentially producing a U-shaped relationship. Against this backdrop, first, we showed that the U-shaped association also exists in China, as shown previously in the USA (the association turns positive after 30). Then, we went one step further and investigated whether this relationship is causal. Once we implemented an innovative causal design, we found that the well-known association disappears. Marrying earlier for couples within the 20-25-year-old age does not increase their risk of divorce. This finding is robust to various specification checks.

It is also in line with the very recent study by Bailey et al. (2021), which focuses on marriages formed in 1965 by young men in a narrow window to avoid the Vietnam draft in the USA. This is the only causal study which tests the hypothesis whether "marrying earlier" (as opposed to "delaying marriages") leads to higher future divorce risk and not on teen marriages (as they focus on the ages 19-20). Like our study, this study also finds that marrying earlier did not increase their divorce probability. We claim that Regression Kink Design, by exploiting a large sample from Chinese Census data and the Chinese reform, allows us to conclude more robustly than the previous studies that the unobserved factors drive this association.

Many unobserved factors may generate the association, for example, impulsivity and impatience. It is very plausible that impulsive and impatient people are more likely to marry earlier, and these personality traits also destabilize marriages. Similarly, as theorized by Oppenheimer, one may argue that "maturity" is another unobserved factor that may enhance marriage stability. Since these traits often assumed to correlate with age, delaying marriage to later ages should, in theory, allow individuals to mature. However, we do not have much evidence of whether the type of maturity relevant for relationship stability increases with age. While there is evidence from psychology literature that risk

behavior, control and future orientation decrease with age; specific types of impulsivity and impatience do not decrease with age beyond teen years (White et al., 1994; Romer et al., 2010).

This question is policy-relevant because young adults are commonly advised to delay marriage to avoid divorce in the popular media. However, the evidence supporting this advice was based on associational studies except for teen marriages (where the advice is well-justified for various other reasons). The question around ideal marriage age has also long been a source of debate between different ideologies and beliefs. We do not aim to support any worldview about the ideal age at marriage. We believe that there may be many valid reasons why young adults might want to delay marriage until later ages. However, we claim that divorce risk should not be one of them.

Knowing that marriage age reform in 1981 did not increase divorce risk is also an important finding for policy debate in China. When it comes to family demography in the Chinese context, scholars have paid more attention to fertility and family planning policies (e.g. Baochang et al. 2007; Huang et al. 2019). We contribute to the literature on the family context in China by focusing on other policy areas such as marriage age laws and the small but growing literature on the predictors of divorce in China (see Yi and Deqing 2000, Chen et al. 2021).

Compliance with Ethical Standards:

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Tables and graphs

Table 1: Non-parametric methods: Minimum age at marriage reform, age at marriage and placebo variables.

	(1) FS Age at marriage (0/1)	(2) SS Ethnic group Han (0/1)	(3) FS Age at marriage (0/1)	(4) SS Primary education (0/1)	(5) FS Age at marriage (0/1)	(6) SS Literate (0/1)	(7) FS Age at marriage (0/1)	(8) SS Live in Pekin (0/1)
Age at Reform × Reform	-0.0159***		-0.0170***		-0.0174***		-0.0181***	
	(0.0050)		(0.0048)		(0.0048)		(0.0047)	
Age at marriage		-0.0181		-0.0155		-0.0007		0.0043
		(0.0122)		(0.0213)		(0.0128)		(0.0140)
Mean Dep. var (eff. obs)	23.6419	0.9624	23.6284	0.9250	23.6222	0.9617	23.6166	0.0389
N	894309	894309	894309	894309	894309	894309	894309	894309
N effect. obs.	209401	209401	215065	215065	217657	217657	220187	220187
Bandwidth	63.0	63.0	64.6	64.6	65.3	65.3	66.5	66.5

Note: The table reports the estimates of interest for the first stage (FS) and second stage (SS) equations using the conventional variance estimator procedure decribed in Calonico et al. (2014). The results are estimated using a Kink design and the optimal bandwidth for women living in urban areas. The sample size and the bandwidths used in the FS and SS regressions are the same within each estimation procedure. Standard errors reported in parentheses are clustered at the forcing variable.***p<0.01;**p<0.05;*p<0.1

Table 2: Age at marriage and ever divorced in urban China (OLS estimates)

	(1) Ever divorced	(2) Ever divorced
Age at marriage<20	0.007***	
	(0.002)	
20-24	0.001	
	(0.001)	
25-29 (Reference category)		
30-34	0.035***	
	(0.003)	
>34	0.135***	
	(0.007)	
Age at marriage for those aged 20-25		-0.005***
		(0.002)
Mean: Ever divorce	0.048	0.045
Age-at-marriage range of women in the sample	All	20 - 25
Observations	824,662	579,797
R-squared	0.009	0.009

Note: Robust standard errors in parentheses. Regressions include time since first marriage FE and control variables for age and for whether the woman is from the Han ethnic group..***p<0.01;**p<0.05;*p<0.1

Table 3: Non-parametric methods: Minimum age at marriage reform, age at marriage and divorce (urban areas)

	Conventional		Bias-corrected		Robust	
	(1) FS Age at marriage (0/1)	(2) SS Ever divorced (0/1)	(3) FS Age at marriage (0/1)	(4) SS Ever divorced (0/1)	(5) FS Age at marriage (0/1)	(6) SS Ever divorced (0/1)
Age at Reform × Reform	-0.0188***		-0.0159***		-0.0159***	
	(0.0046)		(0.0046)		(0.0055)	
Age at marriage		0.0033		0.0073		0.0073
		(0.0140)		(0.0140)		(0.0167)
Mean Dep var (eff. obs)	23.6166	0.0616	23.1627	0.0595	23.1627	0.0595
N	824662	824662	824662	824662	824662	824662
N effect. obs.	215445	215445	408077	408077	408077	408077
Bandwidth (months)	66.3	66.3	124.0	124.0	124.0	124.0

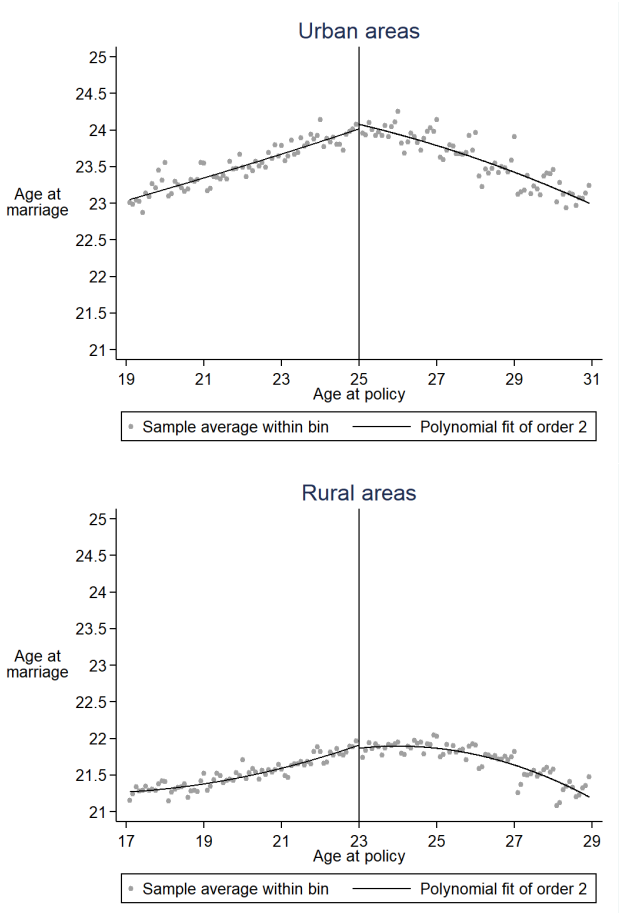
Note: The table reports the estimates of interest for the first stage (FS) and second stage (SS) equations using the three procedures decribed in Calonico et al. (2014): conventional variance estimator, bias-corrected variance estimator and robust variance estimator. The coefficients for the variable *Age at Reform* × *Reform* measure the effect of the reform that decreased in the legal age of marriage on the age of marriage (first stage) in columns 1, 3 and 5. The coefficients for the variable *Age at marriage* measure the effect of age at marriage on ever divorced (second stage equation). The results are estimated using a Kink design and the optimal bandwidth calculated following Calonico et al. (2014) for women living in urban areas. The sample size and the bandwidths used in the FS and SS regressions are the same within each estimation procedure. Standard errors reported in parentheses are clustered at the forcing variable.***p<0.01;**p<0.05;*p<0.1

Table 4: Parametric methods with different bandwidths: Minimum age at marriage reform, age at marriage and divorce (urban areas)

	Linear polynomial		Quadratic polynomial	
	(1) FS Age at marriage (0/1)	(2) SS Ever divorced (0/1)	(3) FS Age at marriage (0/1)	(4) SS Ever divorced (0/1)
Optimal bandwidth (66.3 months)				
Age at Reform × Reform	-0.0281***		-0.0261***	
	(0.0013)		(0.0043)	
Age at marriage		0.0019		0.0091
		(0.0020)		(0.0081)
Sample size	215445	215445	215445	215445
Bandwidth=1.5 × OB (99.45 months)				
Age at Reform × Reform	-0.0308***		-0.0305***	
	(0.0005)		(0.0019)	
Age at marriage		0.0038***		0.0031
		(0.0010)		(0.0048)
Sample size	433370	331352	433370	331352
Bandwidth=0.75 × OB (49.7 months)				
Age at Reform × Reform	-0.0274***		-0.0194**	
	(0.0022)		(0.0077)	
Age at marriage		0.0043		-0.0029
		(0.0027)		(0.0192)
Sample size	168151	168151	168151	168151

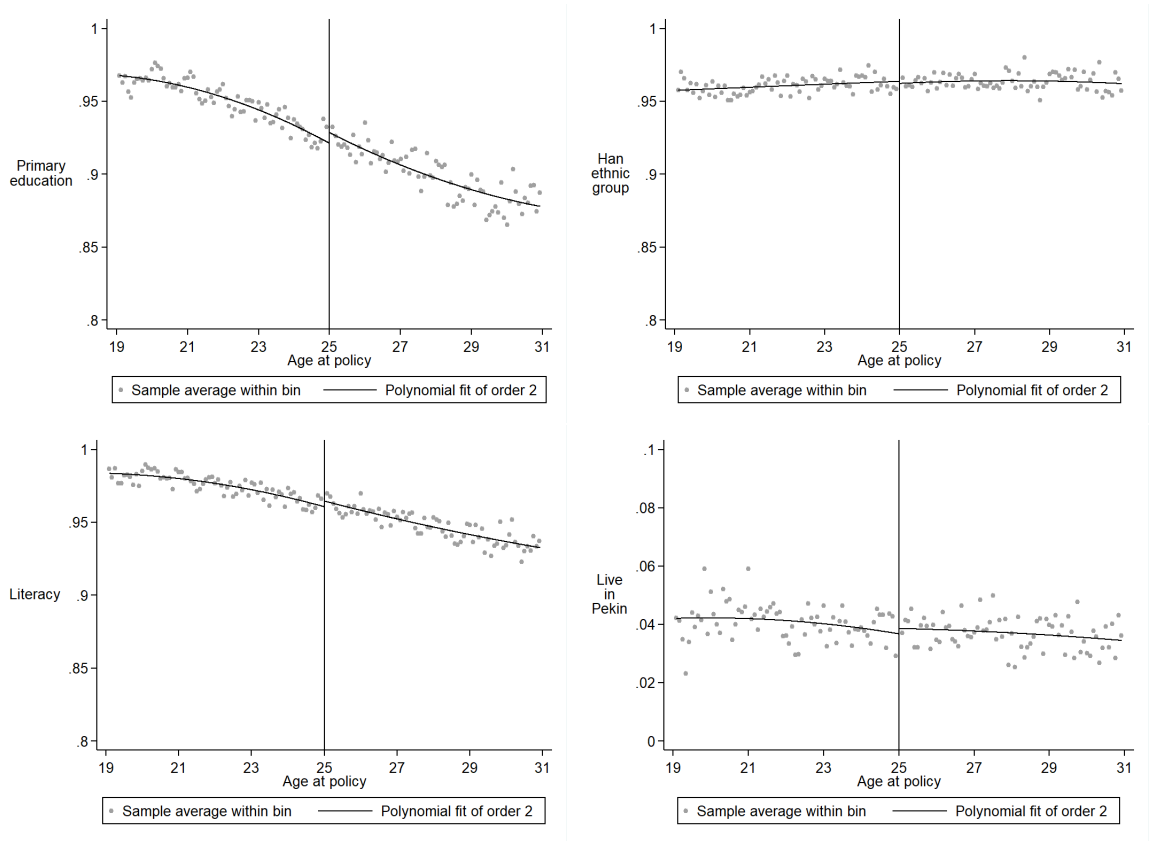
Note: The table reports the estimates of interest for the first stage (FS) and second stage (SS) equations parametric methods with different bandwidths and order polynomials. The coefficients for the variable *Age at marriage* measure the effect of age at marriage on ever divorced (second stage equation). Optimal bandwidth is calculated following Calonico et al. (2014) for women living in urban areas. The sample size and the bandwidths used in the FS and SS regressions are the same within each estimation procedure. Standard errors reported in parentheses are clustered at the forcing variable.***p<0.01;**p<0.05;*p<0.1

Figure 1: Average age at marriage by age of women in 1981: Urban and rural China



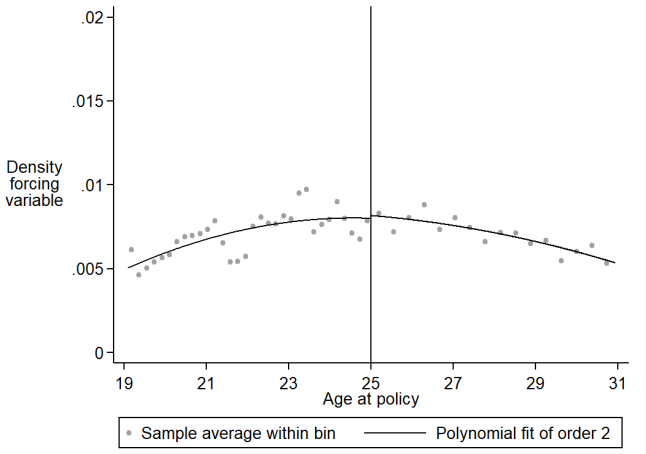
Note: Figure reports the mean age at marriage among the ever-married sample of women living in urban and rural areas. The function used is a second-order polynomial. Data comes from the Chinese Census (2000) and include 232,791 ever-married women living in urban areas in 2000 at the time of the survey and 739,060 ever-married women living in rural areas in 2000 at the time of the survey. Lateness in rural areas was defined as 23, as opposed to 25 in urban areas. Each dot represents the mean age of marriage of the women born in a given year and a given month. We use the survey definition of "urban" and "rural" status.

Figure 2: Kinks around the cut-off for placebo variables: Completed primary education, Ethnic group Han, Literacy and live in Beijing



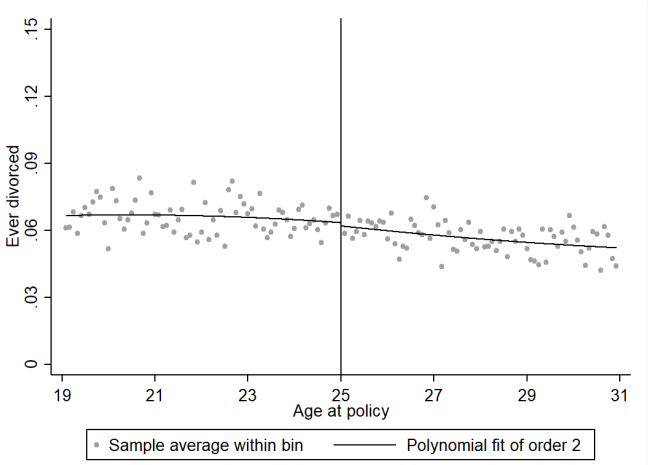
Note: Figure reports share of women with literacy, living in Pekin, being from the Han ethnic group and having primary education among the ever-married sample of women living in urban areas aged between 19 and 31 in January 1981. The function used is a second-order polynomial. Data comes from the Chinese Census (2000) and include 232,791 ever-married women living in urban areas in 2000 at the time of the survey.

Figure 3: Density of the forcing variable



Note: Figure shows the density of the forcing variable around the cut-off, revealing no discontinuities

Figure 4: Ever divorce in urban China



Note: Figure reports the mean probability of ever divorce among the ever-married sample of women living in urban areas aged between 19 and 31 in January 1981. The function used is a second-order polynomial. Data comes from the Chinese Census (2000). Each dot represents the mean probability of ever divorce of the women born in a given year and a given month.

Appendix A: Additional tables and graphs

Table A1: Frequency of the forcing variable around the cut-off (urban areas).

	(1) Density forcing variable (0/1)	(2) Density forcing variable (0/1)	(3) Density forcing variable (0/1)
Age at Reform × Reform	-0.0024	-0.0045	-0.0045
	(0.0030)	(0.0030)	(0.0041)
N	142	142	142
N effect. obs.	34	54	54
Bandwidth (months)	1.5	2.3	2.3
Estimation procedure	Conventional	Bias-corrected	Robust

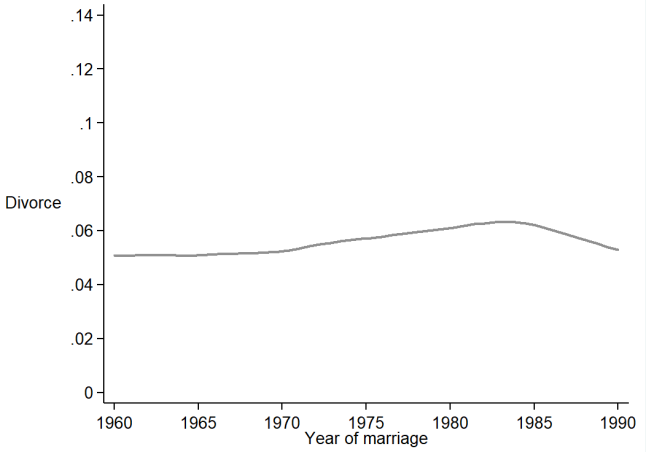
Note: The table reports the estimates of interest using the three procedures decribed in Calonico et al. (2014): conventional variance estimator, bias-corrected variance estimator and robust variance estimator. The coefficients for the variable *Age at Reform* × *Reform* measure the existence of kinks at the cut-off in the density of the forcing variable. The results are estimated using a Kink design and the optimal bandwidth calculated following Calonico et al. (2014) for women living in urban areas. Standard errors reported in parentheses are clustered at the forcing variable.***p<0.01;**p<0.05;*p<0.1

Table A2: Evolution of share of urban population:

	(1) Urban (0/1)	(2) Urban (0/1)	(3) Urban (0/1)
Age at Reform × Reform	-0.0001	-0.0006	-0.0006
	(0.0011)	(0.0011)	(0.0014)
N	3367293	3367293	3367293
N effect. obs.	642495	1069691	1069691
Bandwidth (months)	48.4	84.4	84.4
Estimation procedure	Conventional	Bias-corrected	Robust

Note: The table reports the estimates of interest using the three procedures decribed in Calonico et al. (2014): conventional variance estimator, bias-corrected variance estimator and robust variance estimator. The coefficients for the variable *Age at Reform* × *Reform* measure the existence of kinks at the cut-off in the share of urban population. The results are estimated using a Kink design and the optimal bandwidth calculated following Calonico et al. (2014). Standard errors reported in parentheses are clustered at the forcing variable.***p<0.01;**p<0.05;*p<0.1

Figure A1: Ever divorced (in the year 2000) by year of marriage



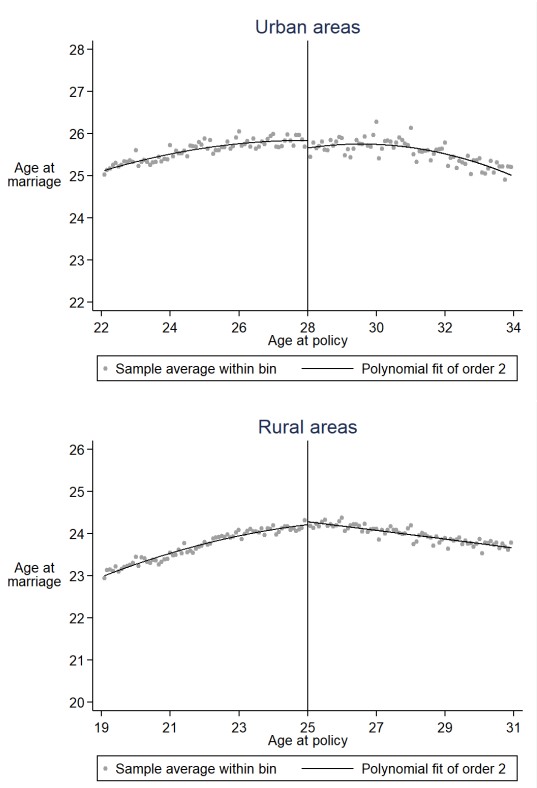
Note: Figure reports the results of a kernel regression on the probability of ever divorce by year of marriage for women married between 1960 and 1990 living in urban areas. Data comes from the Chinese Census (2000).

Table A3: Non-parametric methods: Minimum age at marriage reform, age at marriage and divorce using alternative definition of ever divorced

	Conventional		Bias-corrected		Robust	
	(1) FS Age at marriage (0/1)	(2) SS Ever divorced (0/1)	(3) FS Age at marriage (0/1)	(4) SS Ever divorced (0/1)	(5) FS Age at marriage (0/1)	(6) SS Ever divorced (0/1)
Age at Reform × Reform	-0.0174***		-0.0148***		-0.0148**	
	(0.0047)		(0.0047)		(0.0060)	
Age at marriage		-0.0045		-0.0072		-0.0072
		(0.0121)		(0.0121)		(0.0154)
N	802048	802048	802048	802048	802048	802048
N effect. obs.	203457	203457	203457	203457	203457	203457
Bandwidth (months)	65	65	112.3	112.3	112.3	112.3

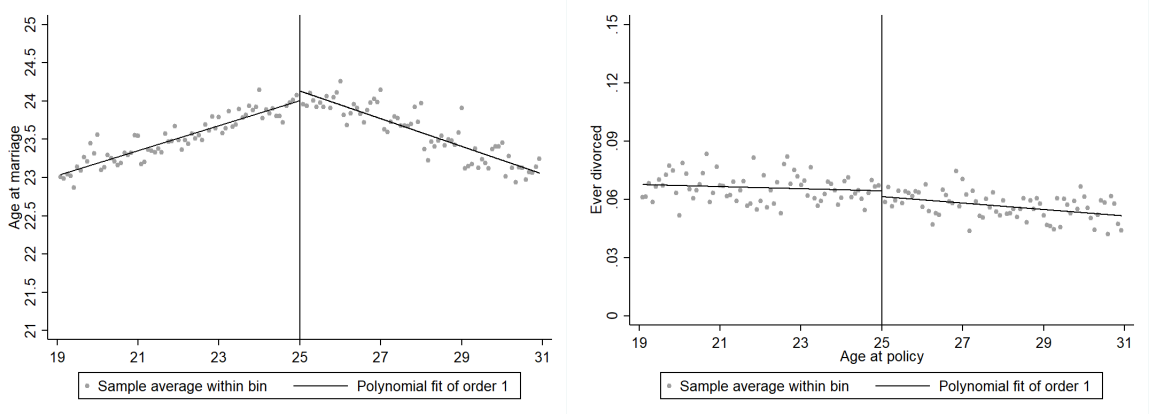
Note: The table reports the estimates of interest for the first stage (FS) and second stage (SS) equations using the three procedures decribed in Calonico et al. (2014): conventional variance estimator, bias-corrected variance estimator and robust variance estimator. The coefficients for the variable *Age at Reform × Reform* measure the effect of the reform that decreased in the legal age of marriage on the age of marriage (first stage) in columns 1, 3 and 5. The coefficients for the variable *Age at marriage* measure the effect of age at marriage on ever divorced (second stage equation). The results are estimated using a Kink design and the optimal bandwidth calculated following Calonico et al. (2014) for women living in urban areas. The sample size and the bandwidths used in the FS and SS regressions are the same within each estimation procedure. Ever divorced excluded from the sample re-married women as we do not know whether re-marriage is after divorced or after widowhood. Standard errors reported in parentheses are clustered at the forcing variable.***p<0.01;**p<0.05;*p<0.1

Figure A2: Average age at marriage by age of men in 1981: Urban and rural China



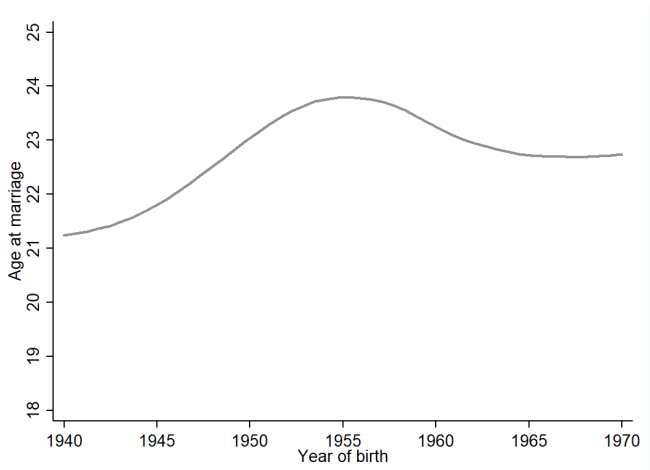
Note: Figure reports the mean age at marriage among the ever-married sample of men living in urban and rural areas. The function used is a second-order polynomial. Data comes from the Chinese Census (2000). Lateness in rural areas was defined as 25, as opposed to 28 in urban areas. Each dot represents the mean age of marriage of the women born in a given year and a given month.

Figure A3: Age at marriage and the probability of ever divorce using the first-order polynomial for the forcing variable



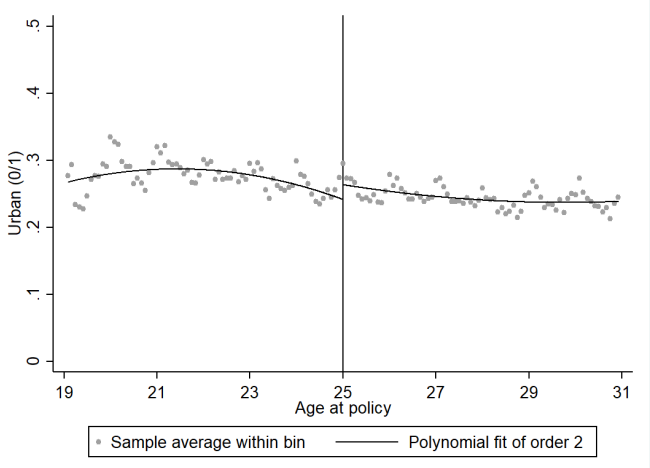
Note: Figure reports the mean age at marriage and mean probability of ever divorce among the ever-married sample of women living in urban areas. The function used is a first-order polynomial. Data comes from the Chinese Census (2000). Each dot represents the mean probability of ever divorce or age at marriage of the women born in a given year and a given month.

Figure A4: Age at marriage by year of birth (urban China)



Note: Figure reports the results of a kernel regression on the age at marriage by year of birth for urban women married born 1940 and 1970. Data comes from the Chinese Census (2000).

Figure A5: Probability of living in urban China



Note: Figure reports the mean probability of living in a urban area among women aged between 19 and 31 in January 1981. The function used is a second-order polynomial. Data comes from the Chinese Census (2000). Each dot represents the mean probability of living in a urban area of the women born in a given year and a given month.

Appendix B: Rural areas

This Appendix reports the results of the analysis in rural areas, where the 1981 law facilitated marriage for women aged between 23 to 20 years old. This analysis's main difference is that the cut-off for the analysis is set for women who were 23 years old rather than 25 when the law came into force.

We start by reporting the statistical association between the age at marriage and the probability of ever divorced. In line with the results obtained for urban areas, we find that the association between the age at marriage and the probability of ever divorced in rural areas also followed a U shape, although the age range with the lower probability of divorce is the one for women that married between the age of 20 and 24. Within the age-at-marriage interval affected by the reform (women marrying between the age of 20 and 23), the estimates reported in column 2 suggest that increasing the age at marriage is associated with a lower probability of divorce.

Table B1: Age at marriage and ever divorced in rural China (OLS estimates)

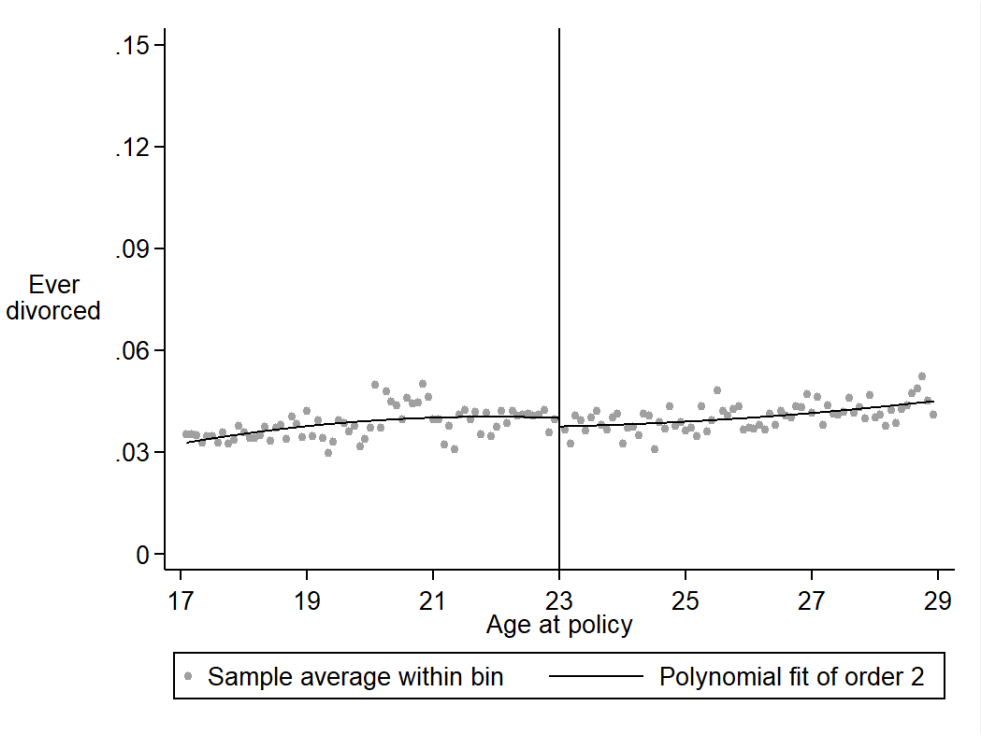
	(1) Ever divorced	(2) Ever divorced
Age at marriage<20	-0.0085***	
	(0.0009)	
Age at marriage 20-24	-0.0128***	
	(0.0006)	
Age at marriage 25-29 (Reference category)		
Age at marriage 30-34	0.0800***	
	(0.0025)	
Age at marriage>34	0.2237***	
	(0.0052)	
Age at marriage		-0.0079**
		(0.0034)
Mean: Ever divorce	0.037	0.031
Age-at-marriage range of women in the sample	All	20-23
Observations	2,536,732	1,372,685
R-squared	0.014	0.007

Note: Robust standard errors in parentheses. Regressions include time since first marriage FE and control variables for age and for whether the woman is from the Han ethnic group..***p<0.01;**p<0.05;*p<0.1

Nonetheless, the statistical associations reported in Table B1 could be driven by unobservable treats affecting both divorce and age at marriage. To overcome this potential source of endogeneity, we would need a kink in the age of marriage around the cut-off to apply RKD in urban areas.

The bottom graph in Figure 1 displays the mean age at marriage by the age of the woman in January 1981. The figure shows that the slope of the age at marriage function changes at the cut-off in rural areas, although the change is not as marked as it is in urban areas. The results of the first stage in rural areas, reported in Table B1, confirm this pattern. However, although the coefficient measuring the size of the kink is consistently negative, it is only statistically significant when it is estimated using the Conventional procedure, casting doubts about the fulfillment of the relevance condition and the validity

Figure B1: Ever divorce in rural China



Note: Figure reports the mean probability of ever divorce among the ever-married sample of women living in rural areas. The function used is a second-order polynomial. Data comes from the Chinese Census (2000). Each dot represents the mean probability of ever divorce of the women born in a given year and a given month.

of the second stage estimations. In any case, the results of the second stage and Figure B1 suggest no kink in the probability of divorce around the cut-off. While the results for rural areas need to be interpreted with caution, they are consistent with the results obtained for urban areas.

Table B2: Non-parametric methods: Minimum age at marriage reform, age at marriage and divorce (rural areas).

	Conventional		Bias-corrected		Robust	
	(1) FS Age at marriage (0/1)	(2) SS Ever divorced (0/1)	(3) FS Age at marriage (0/1)	(4) SS Ever divorced (0/1)	(5) FS Age at marriage (0/1)	(6) SS Ever divorced (0/1)
Age at Reform × Reform	-0.0090**		-0.0057		-0.0057	
	(0.0043)		(0.0043)		(0.0056)	
Age at marriage		-0.0218		-0.0338		-0.0338
		(0.0291)		(0.0291)		(0.0369)
Mean Dep var (eff. obs)	21.6179	0.0390	21.3825	0.0379	21.3825	0.0379
N	2536732	2536732	2536732	2536732	2536732	2536732
N effect. obs.	458230	458230	892397	892397	892397	892397
Bandwidth (months)	50.5	50.5	87.0	87.0	87.0	87.0

Note: The table reports the estimates of interest for the first stage (FS) and second stage (SS) equations using the three procedures decribed in Calonico et al. (2014): conventional variance estimator, bias-corrected variance estimator and robust variance estimator. The coefficients for the variable *Age at Reform* × *Reform* measure the effect of the reform that decreased in the legal age of marriage on the age of marriage (first stage) in columns 1, 3 and 5. The coefficients for the variable *Age at marriage* measure the effect of age at marriage on ever divorced (second stage equation). The results are estimated using a Kink design and the optimal bandwidth calculated following Calonico et al. (2014) for women living in rural areas. The sample size and the bandwidths used in the FS and SS regressions are the same within each estimation procedure. Standard errors reported in parentheses are clustered at the forcing variable.***p<0.01;**p<0.05;*p<0.1