

Discussion Paper Series – CRC TR 224

Discussion Paper No. 139
Project A 02

Can an Increase in the Minimum Age of Marriage Reduce Child
Marriage Rates? Evidence from Mexico

Cristina Bellés-Obrero*
María Lombardi**

December 2019

*University of Mannheim, Department of Economics, Office 326, L7, 3-5, 68161, Mannheim, Germany & CRES(Universitat Pompeu Fabra). *Email:* cbelleso@mail.uni-mannheim.de

**Universidad Torcuato Di Tella, School of Government, Av. Figueroa Alcorta 7350, C1428BCW Buenos Aires, Argentina.
Email: mlombardi@utdt.edu

Funding by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation)
through CRC TR 224 is gratefully acknowledged.

Can an Increase in the Minimum Age of Marriage Reduce Child Marriage Rates? Evidence from Mexico *

Cristina Bellés-Obrero[†]
University of Mannheim

María Lombardi[‡]
Universidad Torcuato Di Tella

November 2019

PRELIMINARY DRAFT. PLEASE DO NOT CITE.

Abstract

We provide empirical evidence on the impact of raising the minimum age of marriage to 18 years old on child marriage, early motherhood, and school enrollment in Mexico. Using a difference-in-differences model that takes advantage of the staggered adoption of this reform across states, we show that banning child marriage leads to a large and statistically significant reduction in the number of registered child marriages. However, we find no effect on the share of girls enrolled in school or the rate of early fertility. We also find that in births with mothers below the age of 18, the drop in the share of formally married mothers as a consequence of the reform is neutralized by an increase in the share of mothers in informal unions. These findings suggest that in places where informal unions are common, raising the minimum age of marriage is not enough to prevent early unions, motherhood, and school dropout.

JEL Classifications: J12, J13, K36, I20

Keywords: child marriage, marriage laws, fertility, schooling

*This research is funded by the CAF Development Bank research grant on human capital formation and youth access to high-quality employment in Latin America. We are grateful for comments from Aixa García Ramos, Andrea Ichino, Rodrigo Soares, and seminar and conference participants at Universidad Torcuato Di Tella, Universidad Nacional de la Plata, the Center for Evaluation and Development, and the LACEA Annual Conference. Bellés-Obrero acknowledges support from the Collaborative Research Center (CRC) TR 224 - EPoS, and the project ECO2017-82350-R.

[†]University of Mannheim, Department of Economics, Office 326, L7, 3-5, 68161, Mannheim, Germany & CRES (Universitat Pompeu Fabra). *Email:* cbelleso@mail.uni-mannheim.de

[‡]Universidad Torcuato Di Tella, School of Government, Av. Figueroa Alcorta 7350, C1428BCW Buenos Aires, Argentina. *Email:* mlombardi@utdt.edu

1 Introduction

Approximately 650 million girls and women alive today were married before the age of 18, where marriage includes both formal marriages and informal unions in which partners live together as if married (UNICEF, 2018). Eradicating this practice is crucial in the fight to reduce global poverty, as child marriage leads to lower educational attainment, earlier age at first childbirth, higher fertility, and worse health and educational outcomes for the children born into child marriages (Field and Ambrus, 2008; Sekhri and Debnath, 2014; Chari et al., 2017). Although most countries' laws set the minimum age of marriage at 18, they typically provide exceptions upon parental consent, pregnancy, authorization from the courts, or due to religious or customary laws, making child marriage legal in practice (Arthur et al., 2018).¹

A common proposal for ending child marriage is to eliminate all exceptions to the minimum age of marriage. Several countries have recently set the minimum age of marriage at 18 without exception, after pressure by human rights groups and civil society organizations.² As long as there is adequate enforcement, these reforms should reduce or even eradicate formal child marriages. But the enforcement of minimum-age-of-marriage laws by government officials may be weak due to prevailing social norms and practices (Acemoglu and Jackson, 2017).³ Perhaps more importantly, the impact of minimum-age-of-marriage laws on overall child marriage rates is likely to depend on the incidence of informal child marriages. Raising the minimum age of marriage may have no impact in societies where most child marriages are not legally registered. Even in places where it is common for young couples to get legally married, the effect of age-of-marriage reforms depends on the alternatives faced by these couples. If informal unions are socially accepted, a drop in the number of formal marriages may be offset by an equal rise in the number of informal unions, leav-

¹A survey of marriage laws in 193 countries conducted by the World Policy Center in 2013 revealed that when all exceptions were considered, 87% of these countries had a minimum age of marriage lower than 18.

²Some recent examples include Chad, Costa Rica, Ecuador, Guatemala, Honduras, Malawi, Nepal, Panama, Turkmenistan, and Zimbabwe (Girls Not Brides, 2017).

³Enforcement may even be unfeasible in contexts where lack of widespread birth registration prevents age verification at marriage (Jensen and Thornton, 2003). Lack of birth registration does not impede the enforcement of minimum-age-of-marriage laws in Mexico, the country we study in this paper, as birth registration is almost universal. A comparison of the number of registered births in 1999 according to vital statistics data and the number of newborn babies in the 2000 census shows that over 96% of births were registered (Péres Paredes and Meneses Mendoza, 2008).

ing child marriage rates unchanged. Since individuals in informal unions may not have the same legal benefits or social recognition as those that are formally married, banning child marriage could even have negative welfare effects. However, if laws banning child marriage have an expressive function (Benabou and Tirole, 2011), they may change social norms and thus reduce the incidence of informal child marriages.⁴

This paper provides empirical evidence on the impact of raising the minimum age of marriage using a natural experiment in Mexico. Mexico ranks seventh in terms of the number of women who were child brides, and so reducing the incidence of child marriage in this country is key to eliminate this practice worldwide.⁵ Towards the end of 2014, the Federal Congress of Mexico enacted a law setting the minimum age of marriage at 18, without exception, and urged states to incorporate this change into their legislation. The gradual adoption of this reform by Mexican states allows us to use a two-way fixed effects difference-in-differences model exploiting variation across states and over time. We first examine the extent to which the reform was enforced. Using microdata from marriage certificates, we find that banning child marriage lead to a 51% reduction in the rates of formal child marriage.⁶ This reduction is concentrated among 16 and 17 year olds, the age groups with the highest rate of child marriages before the onset of the prohibition. Importantly, we show that our estimates are not biased by different pre-trends in states that enacted the ban on child marriage, by couples marrying in states in which child marriage was still legal, or by misreporting of age in marriage certificates.

After establishing that the reform led to a large and statistically significant reduction in formal child marriage rates, we study whether banning child marriage reduces school dropout and early motherhood, two important and detrimental consequence of early unions (Field and Ambrus, 2008; Chari et al., 2017). Since the impact of the reform could change over time, biasing

⁴As laws signal what is right and wrong, they can affect individuals' preferences over the regulated behavior, and lead to higher compliance by changing social norms. The impact of laws beyond deterrence has been empirically corroborated in the case of compulsory voting laws with symbolic fines for abstention in Switzerland and Austria (Funk, 2007; Hoffman et al., 2017), and seat belt laws with low enforcement in the U.S. (Cohen and Einav, 2003).

⁵For further details see <https://www.girlsnotbrides.org/where-does-it-happen> (last accessed September 24, 2019).

⁶The reform only lead to a 51% reduction in registered child marriages because formal child marriage was decreasing in the entire country in our period of analysis for reasons unrelated to the reform. Our estimates thus capture the impact of the law change, above and beyond the countrywide drop in formal child marriage rates.

our difference-in-difference estimates, we perform this analysis using an event-study specification (Goodman-Bacon, 2018; de Chaisemartin and D’Haultfoeuille, 2019). Using data on school attendance from the Mexican labor force survey, and birth registry microdata, we find that the reform had a null impact on school enrollment and early motherhood.⁷ We also find that for births where the mother is younger than 18, banning child marriage leads to a drop in the share of married mothers and an equivalent rise in the share of mothers in an informal union. These findings suggest that in places where cohabitation is socially acceptable, raising the minimum age of marriage drives young couples towards informal unions, thereby having a null overall effect on overall child marriage rates, and consequently on schooling and fertility decisions.

This paper is related to the literature studying the determinants of early marriage and the impact of policies aimed at reducing this practice. Corno et al. (2017) study how aggregate economic conditions affect child marriage rates in Sub-Saharan Africa and India, where marriage is regulated by traditional norms of either bride price or dowry. Given that marriage payments are a source of consumption smoothing, the authors find that negative shocks increase the probability that a girl is married before the age of 18 in societies with bride price, but decrease it in places with norms of dowry. Baird et al. (2011) study the impact of a program granting cash transfers in Malawi, and find that after two years, unconditional cash transfers reduce child marriage and delay fertility, whereas cash transfers conditional on attending secondary school have no impact.⁸ Jensen (2012) examines a randomized controlled trial providing three years of job recruitment services to 15-21 year old women in rural India, and finds that the treatment raises the probability of working, leads to higher investments in schooling or training, and reduces the likelihood of getting married over the three year period. Buchmann et al. (2018) study the impact of a randomized controlled trial in Bangladesh that provided girls with a six-month empowerment program, in-kind transfers in ex-

⁷Banning child marriage may not prevent early motherhood if marriage is the consequence and not the cause of pregnancy. However, we find that prior to the reform, the majority of women who gave birth before the age of 18 and were married or in an informal union at the time of delivery had entered the marriage or union before conception. We discuss this issue in detail in Section 2.

⁸These results can be explained by the fact that in this context, most of the girls at risk of early marriage and teen pregnancy drop out of school regardless of the treatment. These girls experience a positive income shock only when the transfer is not conditioned on school attendance, leading some of them to delay marriage and pregnancy.

change for delaying marriage until the age of 18, or both. The authors find that financial incentives lead to a sizable reduction in the probability of being married before the age of 18, increase school enrollment, and reduce the teenage childbearing. However, there is no impact of the empowerment treatment on child marriage, and no complementarities between the two treatments. Finally, [Bandiera et al. \(Forthcoming\)](#) evaluate the effects of a comprehensive two-year program providing vocational and empowerment training to adolescent girls in Uganda. Among other things, the treatment increases the probability of working, and reduces the likelihood of marriage or cohabitation and teenage pregnancy.

There are two studies in this literature focusing on age-of-marriage laws. Using data from 60 countries, [Collin and Talbot \(2017\)](#) test whether there is a discontinuity in the age-of-marriage distribution at the legal minimum age, where marriage includes formal or informal unions. They find a statistically significant discontinuity at the legal age-of-marriage in around half of the cases, indicating a weak enforcement of age-of-marriage laws. However, the authors do not consider exceptions to the minimum age of marriage based on religion, customs, pregnancy, or judicial authorization, and so it is unclear whether enforcement is also low when all exceptions are considered. The closest papers to ours is [Bharadwaj \(2015\)](#), which studies the impact of a 1957 reform in Mississippi that increased the minimum age of marriage from 12 to 15 for women and from 14 to 17 for men, introduced parental consent requirements for individuals below the age of 18, and implemented a compulsory three-day waiting period and blood tests. Using a difference-in-differences strategy, the author compares counties in Mississippi to those in neighboring states, and finds that three years after the law change, there was a large decrease in the overall marriage rate, a drop in overall birth rates, and a rise in school enrollment rates. While cohabitation was extremely rare in the U.S. at the end of the 1950s ([Lundberg et al., 2016](#)), informal unions and unregistered marriages are relatively common nowadays throughout the developing world.⁹ It is

⁹In the 61 developing countries that participated in the Demographic Health Survey (DHS) in 2008-2017, a third of the 15-19 year old girls who lived with their partners were not formally married. The share of girls who cohabit without being legally married is probably higher, as DHS statistics do not distinguish between registered and unregistered marriages, and marriage registration is low in many developing countries ([Center for Reproductive Rights, 2013](#); [Center for Human Rights, 2018](#)).

crucial to revisit this question in a context where informal unions are common, as these could potentially undermine the success of legal prohibitions at reducing child marriage. The main contribution of our study is that it provides evidence on the impact of banning child marriage in a setting where formal marriage is not the only option for young couples. Ours is also the first study examining the issue of child marriage in Latin America, a region that is currently home to almost 10% of the world's child brides (UNICEF, 2018). Reducing the incidence of child marriage in this region is especially important because despite the rapid worldwide decrease in child marriages, child marriage rates have remained constant over the last 25 years in Latin America.

The paper is organized as follows. Section 2 provides background on child marriage in Mexico, and Section 3 describes the data and provides summary statistics. Section 4 discusses our estimation strategy, and Section 5 presents our results. Section 6 provides evidence from several validity and robustness checks, and Section 7 concludes.

2 Child Marriage and Early Motherhood in Mexico

Child marriage is commonly defined as a union in which at least one of the parties is below the age of 18 (UNICEF, 2018), and includes formal marriage and cohabitation as if married. Throughout the paper, we will refer to the former as formal or registered marriages and to the latter as informal unions. Before 2014, individuals younger than 18 could get formally married in all 32 Mexican states, albeit with some restrictions. Minors needed to have a certain age, and could only get married with the consent of their parents or guardians. The minimum age of marriage with parental consent varied across states, and by gender. For example, the threshold was set at 14 for girls and 16 for boys in the state of Aguascalientes, 16 for both sexes in Morelos, and 16 for girls and 18 for boys in Baja California Sur. Individuals who were younger than the cutoff age or those without parental consent could only get married with the authorization of a judge or the municipal mayor. A few states also allowed girls who were younger than the minimum age to get married if they were pregnant.

In December of 2014, the Federal Congress sanctioned a law defining the rights of children and adolescents. Among other things, this law set the minimum age for marriage for both women and men at 18, without exception, and urged all federal entities to reform their legislation to incorporate this change. Since marriage laws are a competency of the states, it is the prerogative of state Congresses whether to adopt the reform or not.¹⁰ As summarized in Figure 1, the adoption of the reform was gradual. By the end of 2015, only 7 states had changed their marriage laws in accordance to federal legislation. However, by December of 2018, 31 of the 32 Mexican states had raised the minimum age of marriage to 18, as shown in Appendix Figure A.1.

To understand the scope of the change in legislation and its potential to reduce child marriage rates, school dropout, and early motherhood, it is important to analyze the prevalence of these practices before the reform was introduced. Figure 2 shows the evolution in the incidence of child marriage and early childbearing for the cohorts who turned 18 before the reform was enacted. We obtained these data from the *Encuesta Nacional de la Dinámica Demográfica* (ENADID), a nationally representative demographic survey conducted in 2014. Our sample includes almost 84,000 women who were 20 to 54 years old at the time of the survey, and has detailed information on their relationship and fertility history. Around 23% of respondents were in a formal or informal union before turning 18, and this percentage is relatively constant across cohorts.¹¹ Although overall child marriage rates in Mexico have not varied over the last decades, there has been a significant change in the type of child marriage. While formal marriages accounted for approximately 75% of all child marriages in the older cohorts, as seen in Figure 2, less than a third of the child marriages of women born in the early 1990s were formal unions. Therefore, before the minimum age of marriage was increased, approximately 7% of Mexican women got formally married before turning 18.

Despite the declining trend in formal child marriages, this practice was far from being erad-

¹⁰The states of Baja California Sur and Veracruz had already modified their legislation to ban child marriage earlier in 2014.

¹¹For the group of women who had a formal or informal union before turning 18, the average age at which they entered their first marriage or union barely increased over time. In the oldest cohorts, the average age at the time in which the marriage and informal union started is 15.6 and 15.3 years old, respectively. In the cohorts born in the early 1990s, the average is 15.8 years old for marriages and 15.6 for informal unions.

icated before 2014. Figure 3 shows the number of registered marriages that took place in 2013 by the age of the bride, obtained from the marriage certificate microdata, for every 1,000 girls and women of each age. Formal marriage rates were highest for women in their 20s, although child marriage was relatively frequent as well. For every 1,000 girls ages 14 to 17, 9.19 got formally married in 2013. This amounts to 40,298 marriages in total, and accounts for almost 7% of total marriages. Most child marriages had a bride aged 14-17, with the lion's share going to 16 and 17 year olds, who got formally married at a similar rate than women in their early 30s. Since brides ages 14 to 17 had a groom that was 4.62 years older on average, there were very few marriages with a groom below the age of 18, as shown in Appendix Figure A.3.

Early fertility rates were also high before the reform, with one third of women having their first child before the age of 20. As can be seen in Figure 2, 5% of women had their first child at age 16, 7% at age 17, and 8% and 9% at ages 18 and 19, respectively. It was much more uncommon for women to have their first child at younger ages. Only 1.5% of women gave birth at age 14 or lower, and 2.6% at age 15. Appendix Figure A.2 breaks down these statistics by whether the women were child brides (either through a formal marriage or informal union) or were single in the period before they turned 18. The close link between child marriage and early motherhood is evident in that 88% of the women who were married or in an informal union before the age of 18 gave birth before turning 20, whereas only 16% of the women who were not child brides had a child before the age of 20. This does not imply, however, that child marriage precedes early childbearing. For women who got pregnant at a very young age (i.e., before 18), child marriage could be the consequence of early motherhood. If girls get married or form an informal union *after* getting pregnant, policies that prevent child marriage may not reduce early fertility. It turns out, however, that more than half of the women who gave birth before the age of 18 were already cohabitating with their partner before the conception of their first child.

Having established that child marriage was relatively common before the reform, we now provide some descriptive statistics on the baseline characteristics of women who were child brides and women who were not. To the best of our knowledge, there is no longitudinal survey in Mex-

ico that follows women from childhood to marriage. We thus rely on the *Encuesta Demográfica Retrospectiva* (EDER), a nationally representative demographic survey conducted in 2017. This survey was designed to collect retrospective information on a wide array of characteristics related to education, civil status, childhood household characteristics, and parents' education and occupation, among others. To minimize measurement error from long-term recall, we limit our sample to the 4,438 women who were 20-30 in 2013 (i.e., 24-34 at the time of the survey). We then divide them into three groups according to their civil status in the period before age 18. In particular, we compare women who were formally married, in an informal union without getting married, and single before the age of 18. We then compute the average characteristics of each group using the appropriate sampling weights.

Table 1 shows that on average, women who were formally married or in an informal union before the age of 18 come from families of a lower socioeconomic status than women who were single when they turned 18. For instance, 16% of formally married women and 18% of those in an informal union belong to an indigenous group, as opposed to only 9% of single women. The parents of child brides had a substantially lower educational attainment than the parents of those who were single. For example, parents of both types of child brides were 14 percentage points less likely to have more than a primary school education than the parents of women who were single before age 18, and were substantially more likely to work in agriculture. The gap in the baseline socioeconomic status of these groups of women is particularly evident in terms of the ownership of durable assets and housing quality at the time the women were 14 years old. Importantly, 87% of the formal child marriages and informal unions in our sample started at age 15 or higher, and so these characteristics mostly correspond to the period before the child marriage. Moving beyond parental or household characteristics, there were substantial differences among women in terms of other measures by age 14. While 74% and 71% of those who eventually got formally married or entered an informal union were attending school when they were 14, 90% of the women who did not become child brides attended school at this age. Furthermore, the girls who subsequently became child brides were significantly less likely to be attending middle school (the appropriate

level for their age), and had a higher likelihood to be working and performing domestic work at home when they were 14. Taken together, these statistics show that the reform targets women of a relatively low socioeconomic status.

2.1 Comparing Mexico to Other Countries

In this section, we analyze the external validity of our findings by comparing Mexico to other countries in terms of early marriage and fertility rates. Following standard definitions, we assume that a girl took part in a child marriage if she was formally married or cohabitating before the age of 18. We rely on data compiled by the United Nations Population Fund from the Sustainable Development Goals database. These statistics are calculated using the most recent data from 2006-2017, and are available for 116 countries in Africa, Asia and the Pacific, Eastern Europe, and Latin America and the Caribbean. Figure 4 plots the percentage of women ages 20-24 who were formally married or in an informal union before the age of 18 and the annual adolescent fertility rate, defined as the number of births in which the mother is between the age of 15 to 19, for every thousand girls of this age group. In the average country, 24% of women were married before turning 18, with percentages as high as 76% in Niger, and as low as 2% in Tunisia. Mexico is in the 60th percentile of this distribution, with 26% of women married before the age of 18.¹² The child marriage rate in Mexico is the same as in Benin, Brazil, and El Salvador, and is slightly lower than Congo and India, for example. Another relevant outcome for external validity is the fertility rate of young women. The cross-country average in the fertility rate of 15-19 year olds is 74 births per 1,000 girls of this age. Mexico is also a representative country in terms of this outcome, with a fertility rate of 63 births per 1,000 15-19 year old girls, placing Mexico in the 48th percentile.

¹²If we rely on data from the 2014 ENADID instead, 21% of Mexican women ages 20-24 were child brides, placing Mexico in the 48th percentile.

3 Data

To calculate the number of formal child marriages with brides below the age of 18, we relied on the marriage certificate microdata from 2007-2018 provided by INEGI, the Mexican statistical institute. This database has information on all the marriages conducted in Mexico, and specifies the date and state in which the marriage took place, the age of the bride and groom, their state of residence, level of education, and occupation. During this period there were almost 7 million marriages, of which 6.4% had a bride younger than 18 years old. We obtained data on live births from the birth registry microdata provided by the Ministry of Health. Hospital staff are required to complete a form with detailed information on the mother and newborn, which parents then use to obtain their child's birth certificate. Among other things, the birth registration microdata has information on the date and state in which the birth occurred, the length of gestation, the number and timing of prenatal care visits, the newborn's birthweight and APGAR scores, and the mother's birth date, state of residence, and civil status. There were almost 22 million live births in 2008-2017, of which 7.5% had a mother below the age of 18. We also relied on individual data on 2007-2018 from *Encuesta Nacional de Ocupación y Empleo* (ENOE), a quarterly labor force survey with self-reported information on school attendance and the maximum level of education achieved.

Using these data, we constructed a monthly panel for every state with the number of formal child marriages and births by mothers below the age of 18. In the case of school enrollment, our dataset is a repeated cross-section of individual-level observations. We also rely on data on the population of Mexico in each state by age and gender to calculate the formal child marriage rate and the fertility rate of young mothers (i.e., the number of marriages and births per 1,000 girls). We obtained biannual population data for 2007-2017 from the *Consejo Nacional de Población* (CONAPO).¹³ We also obtain time-varying control variables from several sources. Since the en-

¹³CONAPO compiles population counts for each state at the start and middle of each year, by gender and age. These statistics are derived from the decennial censuses and population counts taking place between censuses. Statistics for 2016 onwards are projected. We calculated the monthly population for each age group and gender using linear interpolation.

actment of the child marriage prohibition might depend on the party in power, we created a panel with the political party of the governor in all states from 2007 to 2018 using data from miscellaneous sources. We put together a monthly panel with several economic indicators at the state level. In particular, we obtained the unemployment rate from INEGI, the poverty rate and average income of employed individuals from CONEVAL, and the female labor force participation from ENOE, the Mexican labor force survey.¹⁴ We also obtained the total population from CONAPO.

Our main independent variable throughout the analysis is a dummy for whether formal child marriage was prohibited in a given state, month and year.¹⁵ We went through the civil and family codes of each state to examine whether individuals below the age of 18 could get legally married by December 2017, the end of our study period. We only consider that child marriage is banned if the legislation allows no exceptions. For the 31 federal entities that banned child marriage, we obtained the date in which the articles that establish the minimum age for marriage were modified.¹⁶

4 Estimation Strategy

We use a two-way fixed effects difference in differences model, which exploits variation in the enactment of laws banning child marriage across states and over time. To estimate the impact of the reform on registered child marriages, we use the following specification:

$$Y_{st} = \beta_0 + \beta_1 \text{Child Marriage Banned}_{st} + X_{st}\rho + \gamma_s + \gamma_t + U_{st}, \quad (1)$$

where Y_{st} is the number of registered marriages in state s and month-year t with a bride ages 14-17 per 1,000 girls of this age.¹⁷ We also estimate separate regressions for each age between 14 and 17. Since most registered child marriages in Mexico have a bride that is younger than 18

¹⁴The unemployment rate, poverty rate and average income of employed individuals were also calculated by INEGI and CONEVAL using data from ENOE. Since ENOE is a quarterly survey, we assume the same value within the months of each quarter.

¹⁵In the case of our school enrollment regressions, this regressor varies at the quarterly level.

¹⁶A list on the dates and corresponding legislation is provided in Appendix Table A.1.

¹⁷Even though there are some marriages with brides ages 12-13, these account for less than 0.6% of the child marriages in our sample.

years old but a groom that is 18 or older, we focus on girls.¹⁸ Our main explanatory variable, *Child Marriage Banned*_{st}, is a dummy variable equal to 1 if individuals below the age of 18 were not allowed to get married under any circumstance in state *s* in month-year *t*, and 0 if they were. *X*_{st} is a set of state-specific controls measured in period *t*, namely the unemployment rate, poverty rate, labor force participation of females ages 20 and above, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. We include state fixed effects (γ_s) to control for the time-invariant characteristics of states that affect marriage decisions and may also be correlated with the occurrence and timing of the child marriage prohibition. The month-year fixed effects (γ_t) control for the trend and seasonality in child marriages common to all states. Finally, *U*_{st} are the unobserved factors affecting child marriage rates in state *s* and period *t*, such as religious preferences and social attitudes. We allow for arbitrary within-state correlation of the errors by clustering our standard errors at the state level (Bertrand et al., 2004). Since we only have 32 clusters, we report wild-bootstrap p-values following Cameron et al. (2008).

As depicted in Figure 5, there was substantial heterogeneity in the formal child marriage rate across states before the national push towards banning this practice. Importantly, our state fixed effects γ_s control for these and any other time-invariant differences across states. Our assumption for identifying the causal effect of banning child marriage is that conditional on state fixed effects, time fixed effects, and controls, the timing of the child marriage ban is uncorrelated with the error term. This assumption would be violated if the first states to ban child marriage were those in which child marriage rates were declining at a lower or higher rate. This could occur, for instance, if the prohibition of child marriage was driven by changes in religious preferences or social attitudes. We report the results of several tests validating our identification assumption in Sections 5 and 6. Another validity threat is the possibility that the impact of banning child marriage changes with time. The effect of the reform on formal child marriage rates could vary over time if there is

¹⁸The bride was the only spouse below the age 18 in almost 81% of the registered child marriages in 2007-2017. Both spouses were below 18 in almost 13% of child marriages, and the groom was younger than 18 but the bride was not in only 6% of cases.

a lag between the enactment of the law and its implementation. Perhaps more importantly, even if the child marriage ban is implemented right away, its impact on early motherhood and school enrollment may take some time to materialize. [Goodman-Bacon \(2018\)](#) and [de Chaisemartin and D’Haultfoeuille \(2019\)](#) show that when treatment effects are dynamic, two-way fixed effects models lead to biased estimates, and event-study specifications are preferred instead. In most of our estimations we thus rely on a two-way fixed effects event-study specification, which also allows to test for differential pre-trends:

$$Y_{st} = \alpha + \sum_{j=-K}^{-2} \beta_j \textit{Child Marriage Banned}_{s(t+j)} + \sum_{j=0}^L \beta_j \textit{Child Marriage Banned}_{s(t+j)} + X_{st}\rho + \gamma_s + \gamma_t + U_{st} \quad (2)$$

, where $\textit{Child Marriage Banned}_{s(t+j)}$ is a dummy variable taking the value of 1 j months relative to the month in which the reform was enacted in state s , in states that banned child marriage, and 0 in all other months and states. Following common practice, we exclude $\textit{Child Marriage Banned}_{s(t-1)}$, thus normalizing relative to the month just before the reform was put in place. Since some states implemented the reform towards the end of our sample window, as can be seen in [Appendix Figure A.1](#), the estimates of the longer lags are only estimated using early-adopters, and could thus be contaminated by sample composition changes. We discuss this issue when interpreting the results from these estimations in [Section 5](#). The dependent variable in our fertility regressions is the number of first (live) births conceived in month-year t with a mother below the age of 18 living in state s , for every 1,000 girls of this age. We focus on first births instead of all births because if any, the reform should have an impact on the extensive margin. We take advantage of the fact that the birth registration data has information on the date of birth and the number of weeks of gestation. This allows us to conduct our analysis at the moment of conception, when fertility decisions are taken, rather than the moment of birth. We also study the impact of the reform on school enrollment rates using a similar event-study specification. Unlike our analysis for registered marriages and fertility,

we have a repeated (quarterly) cross-section of individual observations. We thus run the following regression:

$$Y_{ist} = \alpha + \sum_{j=-K}^{-2} \beta_i \textit{Child Marriage Banned}_{s(t+j)} + \sum_{j=0}^L \beta_j \textit{Child Marriage Banned}_{s(t+j)} + X_{ist}\rho + \gamma_s + \gamma_t + U_{ist} \quad (3)$$

, where Y_{ist} is a dummy variable equal to 1 if individual i living in state s is enrolled in school or finished high-school by quarter-year t . We perform this analysis for girls who are 14 to 17 years old at the time of the survey. Our main regressors, $\textit{Child Marriage Banned}_{s(t+j)}$, are dummy variables equal to 1 j quarters relative to the quarter in which child marriage was banned in state s . Our vector of controls X_{ist} includes the standard controls, as well as age dummies and locality-size dummies.

5 Results

5.1 Formal Child Marriages

As shown in Table 2, raising the minimum age of marriage leads to a large and statistically significant reduction in the incidence of formal child marriages. In our preferred specification displayed in column 4, we control for month-year fixed effects, state fixed effects, and time-varying state characteristics, and find that outlawing child marriage results in 0.368 less formal marriages per month per 1,000 girls of ages 14-17, a 51% reduction over the mean. The estimate is significant at the 1% based on standard errors clustered by state (in parentheses) and wild bootstrap p-values (in brackets). Column 5 reports the results of a regression weighting by the female population ages 14 to 17, and the results are almost unchanged. Note that the legislation change does not eliminate child marriages because child marriage rates were dropping in all states before the reform.¹⁹ Back

¹⁹Furthermore, some couples residing in states that banned child marriages took the matter to the courts, and were allowed to get married with the ruling of the judge (García Sánchez, 2019).

of the envelope calculations reveal that approximately 51 thousand formal child marriages were averted due to the law change. We also find that the reduction in registered child marriages is entirely driven by marriages with brides ages 16 and 17, as can be seen in Table 3. This is to be expected, since formal marriage rates in the pre-treatment period were much lower for 14 and 15 year olds, in part because many states required the authorization of a judge or mayor to get married at this age.

To understand the timing of the effects we use the event-study specification in equation (2). We focus on the formal child marriage rate of 16-17 year olds, the age groups for which the reform had an impact.²⁰ Figure 6 plots the estimated coefficients and their 95% confidence intervals for each month in the year before child marriage was banned, and 24 months after. We only report the estimates for 24 lags because at the end of our sample period there were few states for which more than 24 months had passed since the reform.²¹ However, even with this restriction, the coefficient for the longest lag is estimated using only 21 of the 31 states that enacted the reform, and so the estimates for the longest lags must be taken with caution. Figure 6 shows that the negative impact of banning child marriage on child marriage rates is realized right when the ban occurs, and persists at similar levels for the following two years. The coefficient for month 0 (i.e., the month in which the law was changed) is lower than those of the following months because the law changes were often conducted towards the end of the month, as can be seen in Appendix Table A.1. Importantly, the states that banned child marriage do not exhibit differential pre-trends in formal child marriage rates up to twelve months before the prohibition, and the lead coefficients are small and statistically indistinguishable from zero. We also report the results of these estimates in Table 4. For ease of interpretation, we grouped the estimates into 4-month periods.

After establishing that banning child marriage leads to a reduction in the rate of registered marriages with 16 and 17 year old brides, we examine if the affected cohorts get formally married once they turn 18, or delay marriage even longer. If the 16 and 17 year old girls who would have

²⁰We also report the event-study estimates with the formal child marriage rate of 14-17 year olds as the dependent variable in Appendix Figure A.4.

²¹We bin longer lags together, and estimate them using a single dummy variable which is not reported in the plot.

gotten married in the absence of the prohibition get married when they turn 18, we should see an increase in the marriage rate of 18 year olds shortly after the ban (i.e., once the affected cohorts started turning 18). Given the dynamic nature of these effects, the most appropriate specification is an event-study. As can be seen in Appendix Figure A.5, there appears to be a positive impact on the marriage rate of 18 year-olds around 10 months after the reform was passed. However, these coefficients are quite noisy, and this impact is much smaller than the drop in the marriage rate of 17 year-olds, indicating that although some couples might get married once they turn 18, others postpone it, or dissolve before they can get legally married. Importantly, there are no differential pre-trends, as can be seen by the small and statistically insignificant lead coefficients.

5.2 School Enrollment

Figure 7 presents the event-study estimates of the impact of banning child marriage on school enrollment for 14 to 17 year-old girls. We only report the estimates for the first 7 quarters after the reform, because there are few states with longer lags. While one could expect the reduction in formal child marriages to translate into an increase in school enrollment rates, we find negative but small and statistically insignificant impacts of banning child marriage on school attendance. These null results persist seven quarters after the reform. In particular, we can reject an increase in enrollment rates larger than 1 percentage point. We observe similar impacts if we focus on 16 to 17 year-olds, as shown in Figure A.6, or if we separately analyze girls in each age group, as shown in Table 5. It should be noted, however, that the coefficient for the longest lag is estimated using 24 of the 31 states that enacted the reform, and so these estimates must be taken with caution due to differences in sample composition. Importantly, there are no differential trends.

5.3 Early Motherhood

The impact of banning child marriage on fertility is *a priori* unclear. If social norms discourage some girls who are not legally married from having children, the prohibition of child marriage could lead to a reduction in birth rates. However, girls affected by the ban could conceive out of

wedlock or in an informal union, thus reducing or even eliminating the effect of the reform on early fertility. As can be seen in Figure 8, the reform did not have a statistically significant impact on the fertility rate of 16-17 year old girls, the age group which saw a reduction in formal marriage rates as a consequence of the reform. If we focus on 14-17 year olds, there is no effect on fertility as well (Figure A.7). In particular, we can reject a reduction larger than 0.2 births per 1,000 girls, a 4% reduction over the mean. We also report the results of these estimates in Table 6. Importantly, there are no differential trends in early fertility rates.

Taking advantage of the fact that the birth registration data also has information on the civil status of the mother at the moment of birth, we estimate the impact of banning child marriage on the share of 16-17 year old mothers who were formally married or in an informal union. The results are presented in Figure 9 and Table 7. Consistent with our results on formal child marriage rates, we find that eliminating all exceptions to the minimum age of marriage gradually reduces the share of 16-17 year old mothers who are formally married. Furthermore, the reduction in the share of married mothers is completely counteracted by an increase in the share of mothers who are in an informal union. Importantly, there are no differential pre-trends in the civil status of mothers, substantiating the causal interpretation of our estimates.

6 Validity Checks

6.1 Accuracy of Marriage Certificate Data

Blank et al. (2009) show that using marriage certificate data to study the impact of age-of-marriage laws can lead to biased estimates for two reasons. First, underage individuals could potentially travel to states where child marriage is permitted and get married there. Since our marriage certificate data has information on the state of occurrence of the marriage and the state of residence of the bride and groom, we can examine whether this issue is likely to bias our estimates. Only 2% of the child marriages in our period of analysis took place in a state that does not coincide with the bride's or groom's state of residence, leaving little room for spillovers to bias our estimates.

As shown in Panel A of Appendix Table A.2, the magnitude and statistical significance of our estimates is almost unaffected if we conduct our analysis using the state in which the marriage took place instead of the bride’s state of residence.²² The second concern raised by the findings of Blank et al. (2009) is that underage individuals can still marry in their state of residence by lying about their age. The possibility that young people lie about their age to get around the child marriage prohibition is less of a concern in our setting, as state laws require individuals to present their birth certificates to get married.²³ If underage brides were lying about their age as a response to the ban in child marriages, we should see a rise in the marriage rate for 18 year olds immediately after the reform. As we show in Appendix Figure A.5, this is not the case.

6.2 Unobservable Confounders

As discussed in Section 4, our assumption for identifying the causal effect of banning child marriage is that conditional on state fixed effects, month-year fixed effects, and controls, there are no time-varying state-specific factors correlated with the ban in child marriage and our outcome variables. One potential source of bias is that child marriage prohibitions could be driven by a state-specific decline in the value placed on marriage. If that were the case, we should also observe a drop in the marriage rates of older women not affected by the ban. However, as can be seen in Appendix Table A.3 and Appendix Figures A.8-A.9, banning child marriage has no impact on the marriage rates and share of married mothers for women of other ages. In the case of fertility, our null impacts could be driven by unobservable determinants of fertility that correlate with the timing of the child marriage ban. For example, states might have decreased the funding for contraception programs, leading to higher childbearing rates that counteract a reduction in fertility resulting from the reform. However, as shown in Appendix Figures A.10-A.11, the ban in child marriage is not correlated with changes in the fertility rates of women in other age groups, further corroborating

²²We also redo this analysis focusing on the groom’s state of residence, as the bride and groom reside in different states in 5% of the child marriages in our sample. As can be seen in Panel B of Appendix Table A.2, our coefficients are almost identical to our baseline specification which uses the state of residence of the bride.

²³The evidence from Blank et al. (2009) is from the U.S. in the 1950s, when documentary evidence of proof of age was not generally required to get married.

our findings.

7 Conclusion

We examine the impact of a reform that increased the minimum age of marriage in Mexico on child marriage rates, school enrollment, and early fertility. Using microdata derived from marriage certificates, we find that banning child marriage leads to a large and statistically significant reduction in the number of registered child marriages. However, the reform does not lead to a subsequent reduction in the dropout or fertility rates of the affected cohorts. Using data on the civil status of mothers reported in birth registration data, we find that the reduction in the share of married mothers caused by the child marriage ban is counteracted by an equivalent rise in the share of mothers in an informal union. These findings suggest that in places where cohabitation is a socially acceptable alternative to formal marriage, raising the minimum age of marriage is not enough to reduce child marriage rates, and consequently fertility and school dropout. One option for policymakers is to modify age-of-consent laws to make informal child marriages illegal as well. Alternatively, recent findings from Malawi ([Baird et al., 2011](#)), India ([Jensen, 2012](#)), Bangladesh ([Buchmann et al., 2018](#)), and Uganda ([Bandiera et al., Forthcoming](#)) show that policies providing young girls with economic opportunities or direct incentives to delay marriage may be effective at reducing child marriage rates. Future research should corroborate whether these findings also generalize to other regions, where the drivers of child marriage may differ.

References

- Acemoglu, Daron and Matthew O Jackson**, “Social Norms and the Enforcement of Laws,” *Journal of the European Economic Association*, 2017, 15 (2), 245–295.
- Arthur, Megan, Alison Earle, Amy Raub, Iona Vincent, Efe Atabay, Isabel Latz, Gabriella Kranz, Arijit Nandi, and Jody Heymann**, “Child Marriage Laws Around the World: Minimum Marriage Age, Legal Exceptions, and Gender Disparities,” *Journal of Women, Politics & Policy*, 2018, 39 (1), 51–74.
- Baird, Sarah, Craig McIntosh, and Berk Özler**, “Cash or Condition? Evidence from a Cash Transfer Experiment,” *Quarterly Journal of Economics*, 2011, 126 (4), 1709–1753.
- Bandiera, Oriana, Niklas Buehren, Robin Burgess, Markus Goldstein, Selim Gulesci, Imran Rasul, and Munshi Sulaiman**, “Women’s Empowerment in Action: Evidence from a Randomized Control Trial in Africa,” *American Economic Journal: Applied Economics*, Forthcoming.
- Benabou, Roland and Jean Tirole**, “Laws and Norms,” 2011. NBER Working Paper 17579.
- Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan**, “How Much Should we Trust Differences-in-Differences Estimates?,” *Quarterly Journal of Economics*, 2004, 119 (1), 249–275.
- Bharadwaj, Prashant**, “Impact of Changes in Marriage Law Implications for Fertility and School Enrollment,” *Journal of Human Resources*, 2015, 50 (3), 614–654.
- Blank, Rebecca M, Kerwin Kofi Charles, and James M Sallee**, “A Cautionary Tale About the Use of Administrative Data: Evidence from Age of Marriage Laws,” *American Economic Journal: Applied Economics*, 2009, 1 (2), 128–49.
- Buchmann, Nina, Erica Field, Rachel Glennerster, shashana Nazneen, Svetlana Pimkina, and Iman Sen**, “Power vs. Money: Alternative Approaches to Reducing Child Marriage in Bangladesh, a Randomized Control Trial,” 2018. Working Paper.

- Cameron, A Colin, Jonah B Gelbach, and Douglas L Miller**, “Bootstrap-Based Improvements for Inference with Clustered Errors,” *Review of Economics and Statistics*, 2008, 90 (3), 414–427.
- Chari, AV, Rachel Heath, Annemie Maertens, and Freeha Fatima**, “The Causal Effect of Maternal Age at Marriage on Child Wellbeing: Evidence from India,” *Journal of Development Economics*, 2017, 127, 42–55.
- Cohen, Alma and Liran Einav**, “The Effects of Mandatory Seat Belt Laws on Driving Behavior and Traffic Fatalities,” *Review of Economics and Statistics*, 2003, 85 (4), 828–843.
- Collin, Matthew and Theodore Talbot**, “Do Age-of-Marriage Laws Work? Evidence from a Large Sample of Developing Countries,” 2017. Center for Global Development Working Paper 458.
- Corno, Lucia, Nicole Hildebrandt, and Alessandra Voena**, “Age of Marriage, Weather Shocks, and the Direction of Marriage Payments,” 2017. NBER Working Paper 23604.
- de Chaisemartin, Clément and Xavier D’Haultfoeuille**, “Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects,” 2019. NBER Working Paper 25904.
- Center for Human Rights**, “Child Marriage in Africa,” Technical Report, Center for Human Rights 2018.
- Center for Reproductive Rights**, “Child Marriage in South Asia. International and Constitutional Legal Standards and Jurisprudence for Promoting Accountability and Change,” Technical Report, Center for Reproductive Rights 2013.
- Girls Not Brides**, “The Case for a Minimum Age of Marriage of 18,” Technical Report, Girls Not Brides 2017.
- Field, Erica and Attila Ambrus**, “Early Marriage, Age of Menarche, and Female Schooling Attainment in Bangladesh,” *Journal of Political Economy*, 2008, 116 (5), 881–930.

- Funk, Patricia**, “Is There an Expressive Function of Law? An Empirical Analysis of Voting Laws with Symbolic Fines,” *American Law and Economics Review*, 2007, 9 (1), 135–159.
- Goodman-Bacon, Andrew**, “Difference-in-Differences with Variation in Treatment Timing,” 2018. NBER Working Paper No. 25018.
- Hoffman, Mitchell, Gianmarco León, and María Lombardi**, “Compulsory Voting, Turnout, and Government Spending: Evidence from Austria,” *Journal of Public Economics*, 2017, 145, 103–115.
- Jensen, Robert**, “Do Labor Market Opportunities Affect Young Women’s Work and Family Decisions? Experimental Evidence from India,” *Quarterly Journal of Economics*, 2012, 127 (2), 753–792.
- **and Rebecca Thornton**, “Early Female Marriage in the Developing World,” *Gender & Development*, 2003, 11 (2), 9–19.
- Lundberg, Shelly, Robert A Pollak, and Jenna Stearns**, “Family Inequality: Diverging Patterns in Marriage, Cohabitation, and Childbearing,” *Journal of Economic Perspectives*, 2016, 30 (2), 79–102.
- Paredes, Elsa Péres and Eloisa Meneses Mendoza**, “El registro de los nacimientos. Una revaloración de la fuente para medir la fecundidad en México,” 2008. Mimeo.
- Sánchez, Arán García**, “Matrimonio, edad para contraerlo y divorcio ante los derechos humanos en México,” in “La Declaración Universal de los Derechos Humanos en su septuagésimo aniversario. Temas contemporáneos,” Grupo Editorial Mariel, 2019.
- Sekhri, Sheetal and Sisir Debnath**, “Intergenerational Consequences of Early Age Marriages of Girls: Effect on Children’s Human Capital,” *The Journal of Development Studies*, 2014, 50 (12), 1670–1686.

UNICEF, “Child Marriage. Latest Trends and Future Prospects,” Technical Report, UNICEF 2018.

Figure 1: Variation in the Timing of Adoption of Child Marriage Ban

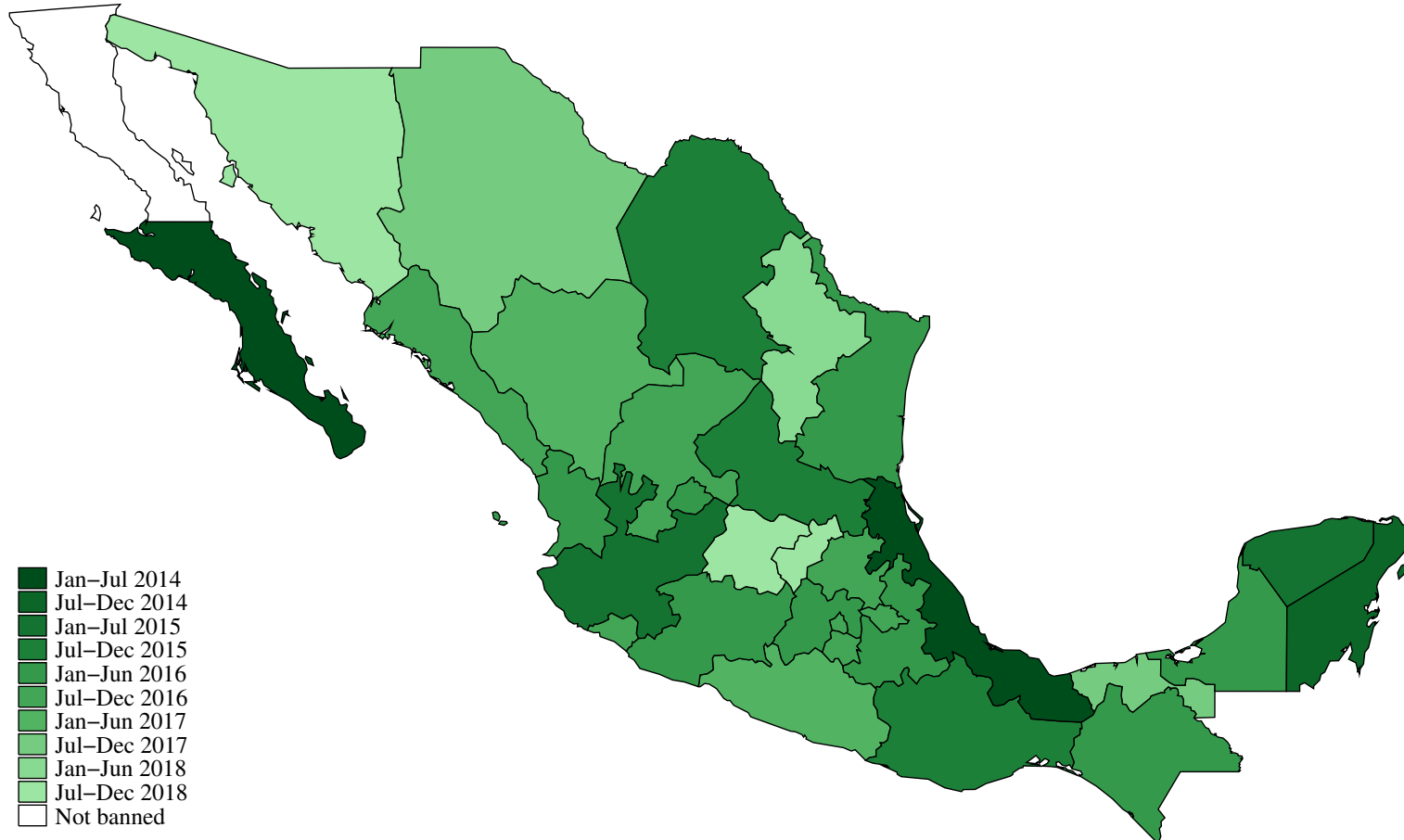
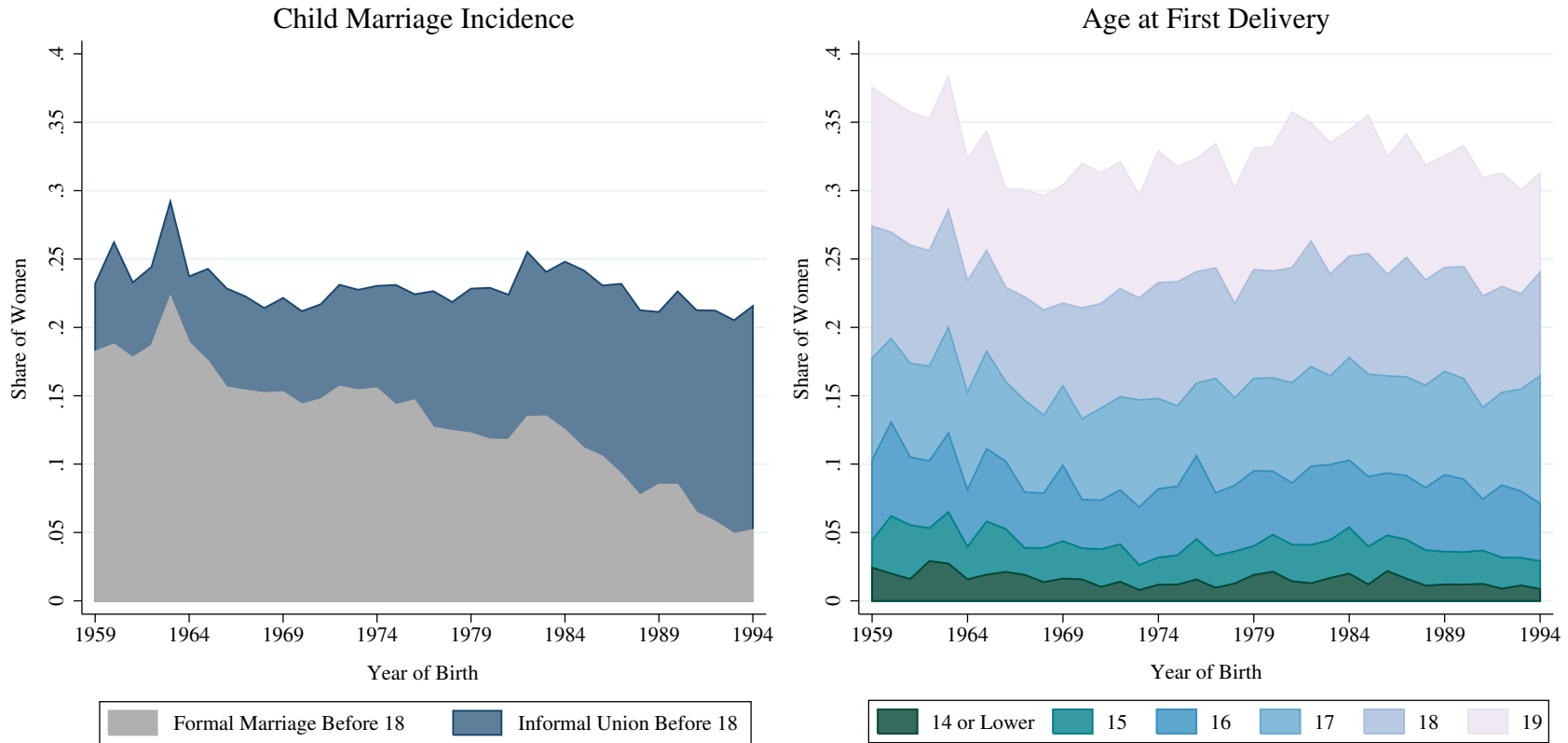
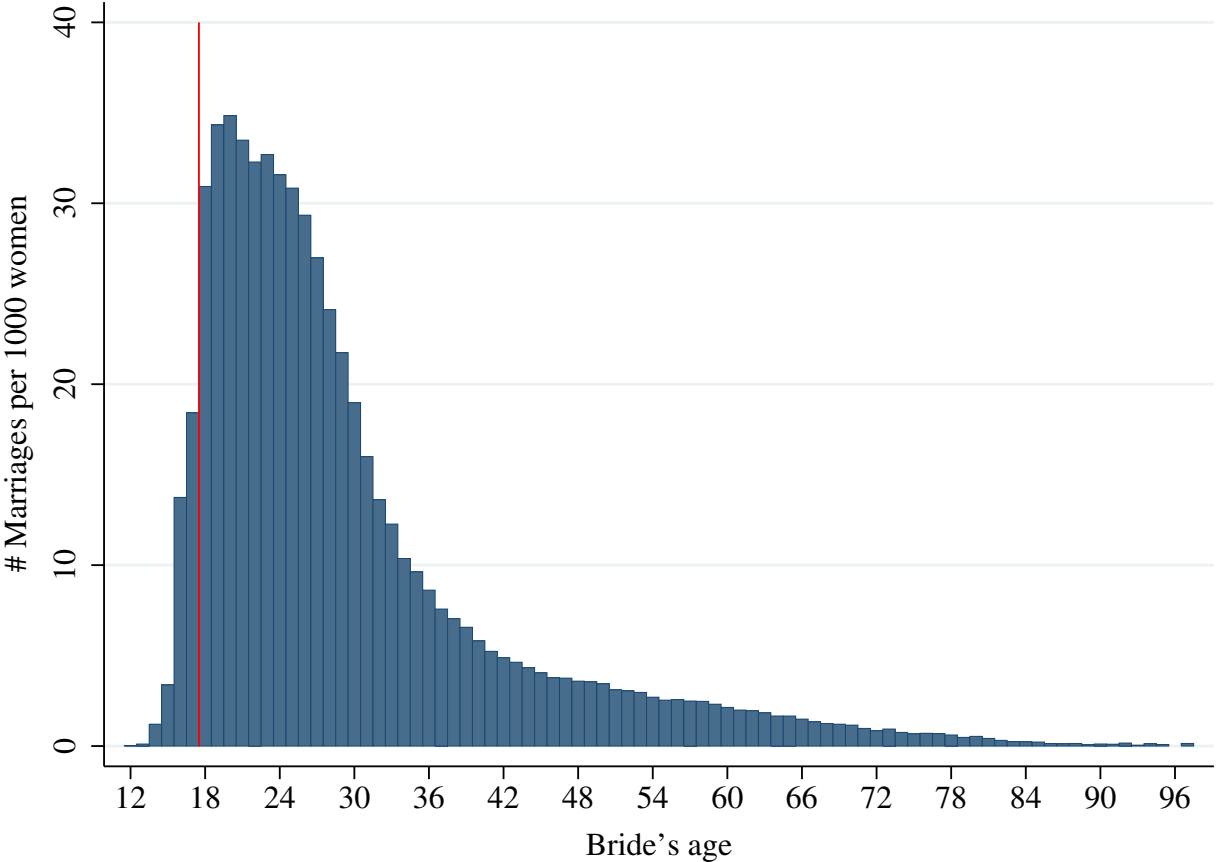


Figure 2: Evolution of Child Marriage and Early Fertility



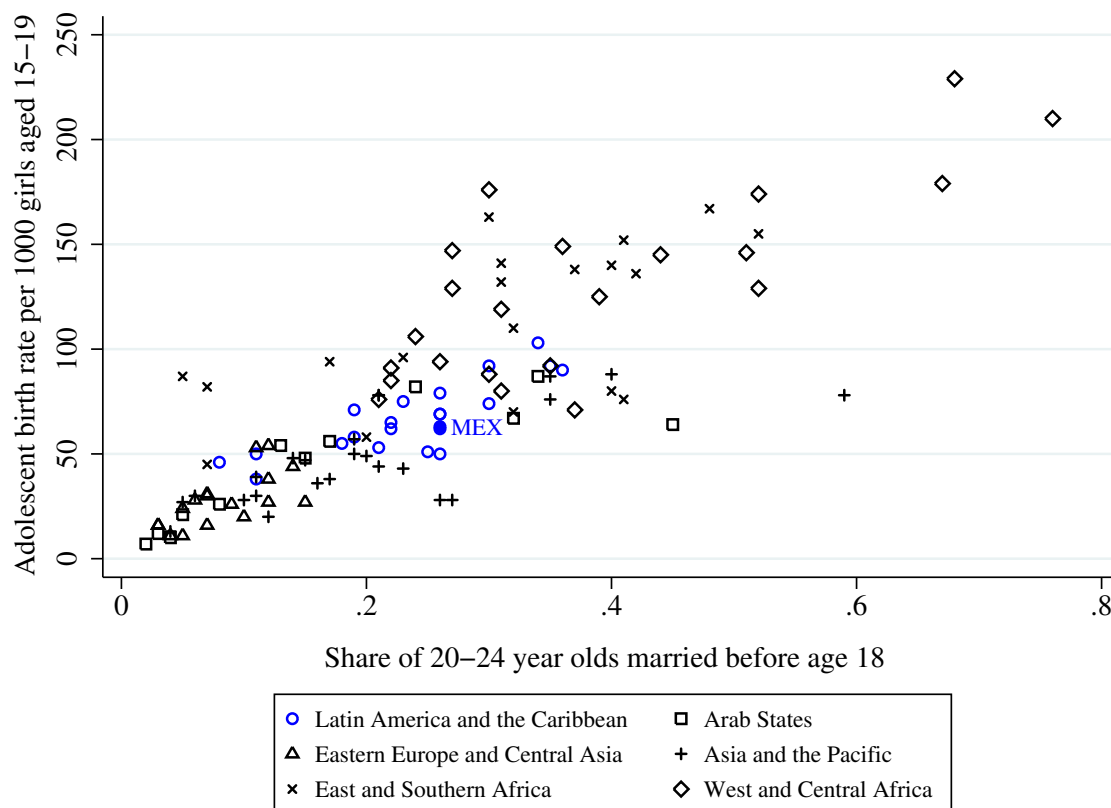
Notes: The first graph depicts the share of women who were formally married and in an informal union before the age of 18, by their birth year. These two categories are mutually exclusive. Women in an informal union are those who had an informal union before the age of 18 but did not get formally married by this age. The second figure shows the share of women, regardless of their civil status, who gave birth at different ages, by their year of birth. The source of these data is the *Encuesta Nacional de la Dinámica Demográfica* (ENADID), a demographic survey conducted in 2014. We took the sample of 83,554 women who were 20-54 at the time of the survey, and computed the share of women in each category using sampling weights.

Figure 3: Number of Registered Marriages per 1,000 Girls and Women in 2013, by the Bride's Age



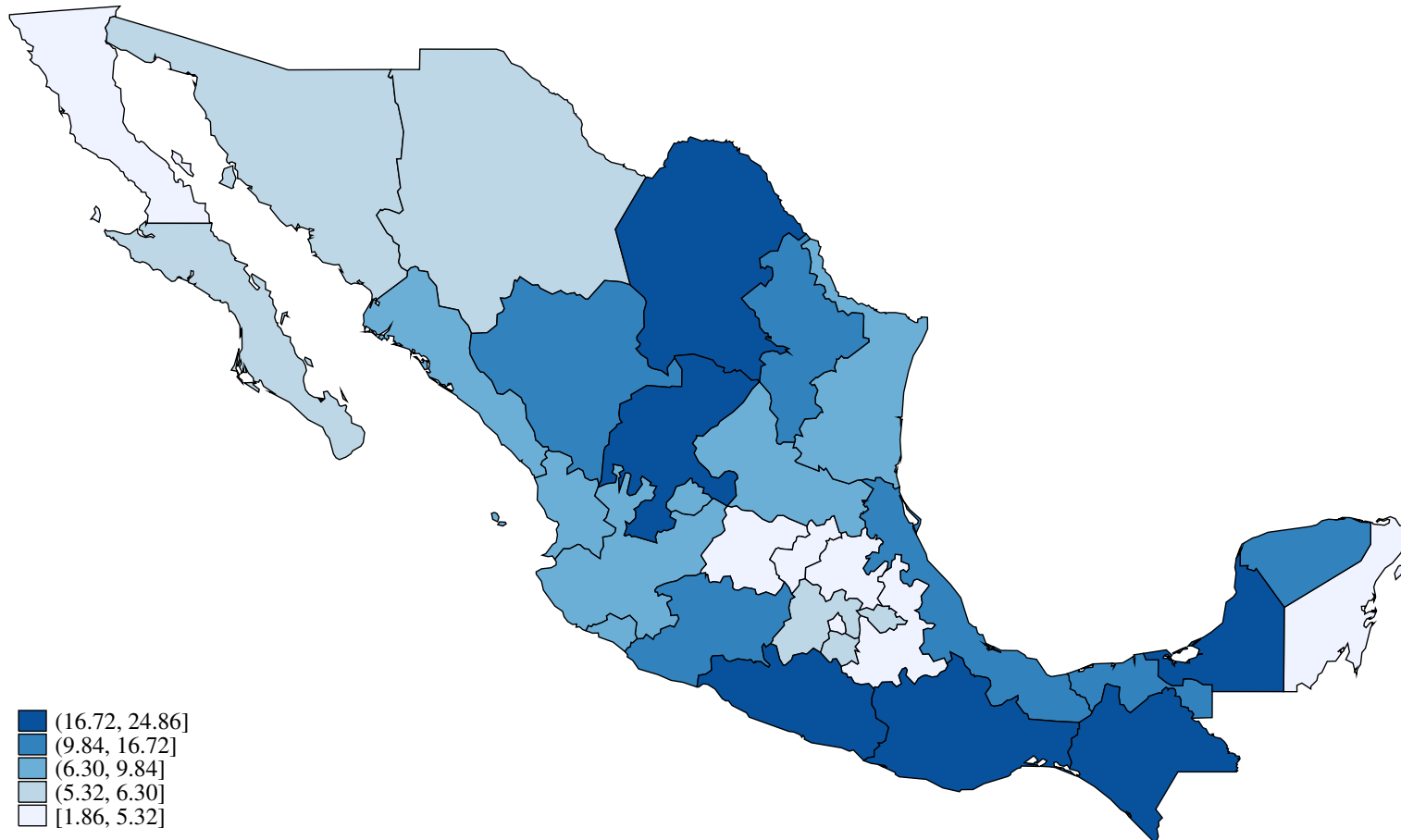
Notes: This figure depicts the number of legally registered marriages by the age of the bride, per 1,000 women and girls of each age in 2013. The number of marriages was obtained from marriage certificate microdata, and the population from CONAPO.

Figure 4: Cross-Country Comparison of Child Marriage and Adolescent Fertility Rates



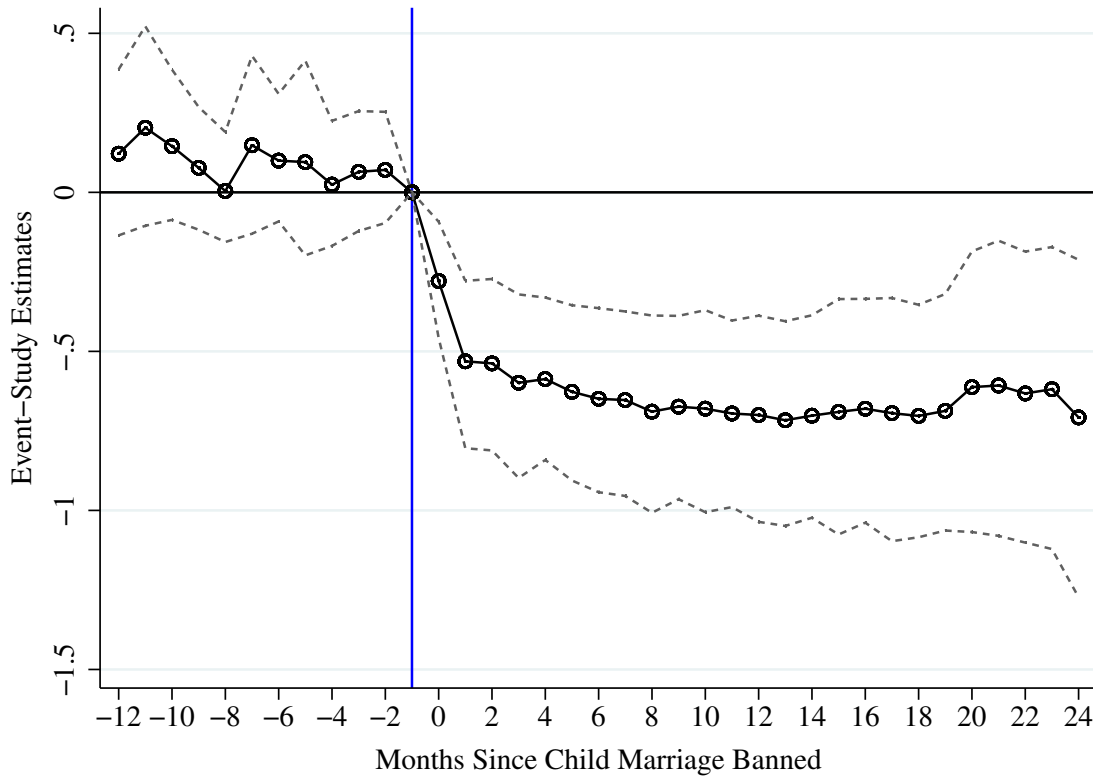
Notes: This figure depicts the relationship between the percentage of women ages 20-24 who were married before the age of 18 and the adolescent fertility rate for 116 countries. Marriage is defined as formal marriage or cohabitation as if married, and the adolescent fertility rate is the number of births per 1,000 girls ages 15-19. The marker shape identifies the region each country belongs to. The data was compiled by the United Nations Population Fund from the Sustainable Development Goals database, and includes 116 countries in Africa, Asia and the Pacific (except Japan), Eastern Europe, and Latin America and the Caribbean. Only countries with statistics in 2006-2017 are included.

Figure 5: Number of Registered Marriages in 2013 per 1,000 Girls Ages 14-17



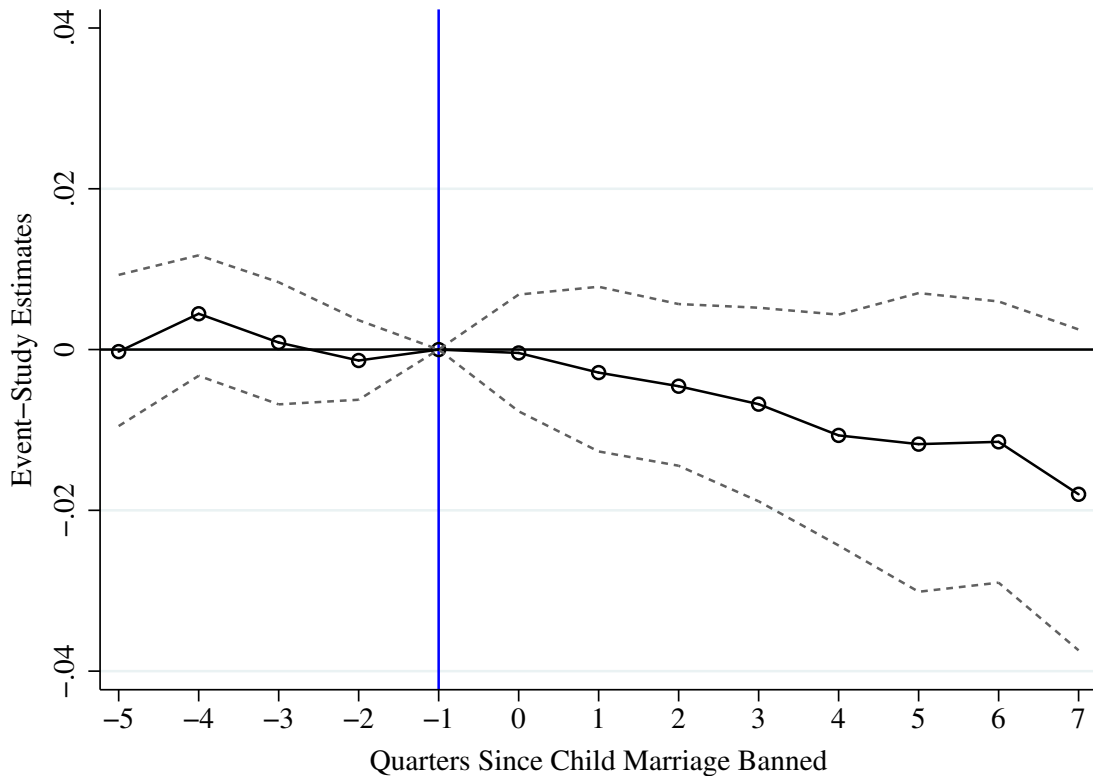
Notes: This figure depicts the number of legally registered marriages with a bride aged 14-17, per 1,000 girls of this age in 2013. The number of marriages was obtained from marriage certificate microdata, and the population from CONAPO.

Figure 6: Event-Study Estimates of the Effect of Banning Child Marriage on Formal Marriage Rates – 16 and 17-Year-Old Girls



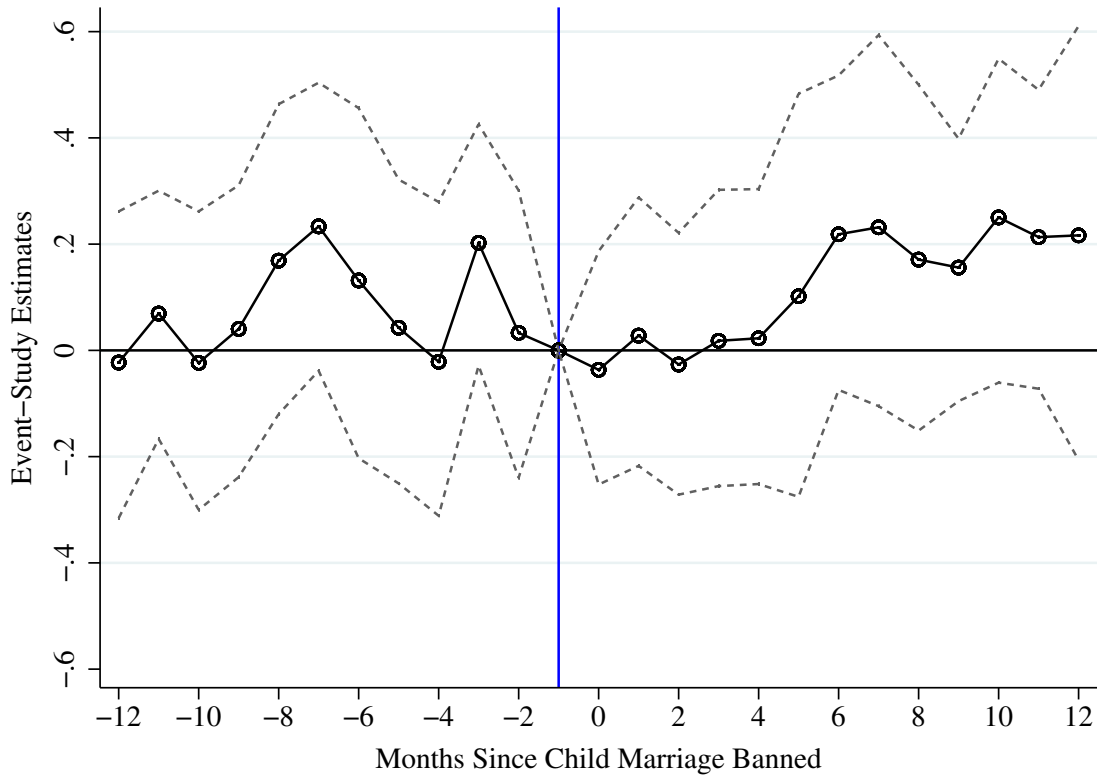
Notes: The sample includes all Mexican states in 2007-2018, and the unit of observation is a month-state. The figure plots the coefficients and 95% confidence intervals based on wild-bootstrap clustered standard errors of a regression in which the dependent variable is the monthly number of marriages per 1,000 girls ages 16-17 who reside in a state s in month-year t . The regressors of interest are dummy variables for each month relative to the period in which child marriage was banned in state s , with the month before the reform being the omitted category. We only report 12 lead coefficients for ease of interpretation, and 24 lag coefficients because there are few states for which more than 24 months have passed since the reform was enacted. The regression also includes state fixed effects, month-year fixed effects, states' unemployment rate, poverty rate, female labor force participation, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors are clustered at the state level.

Figure 7: Effect of Banning Child Marriage on School Enrollment – 14 to 17-Year-Old Girls



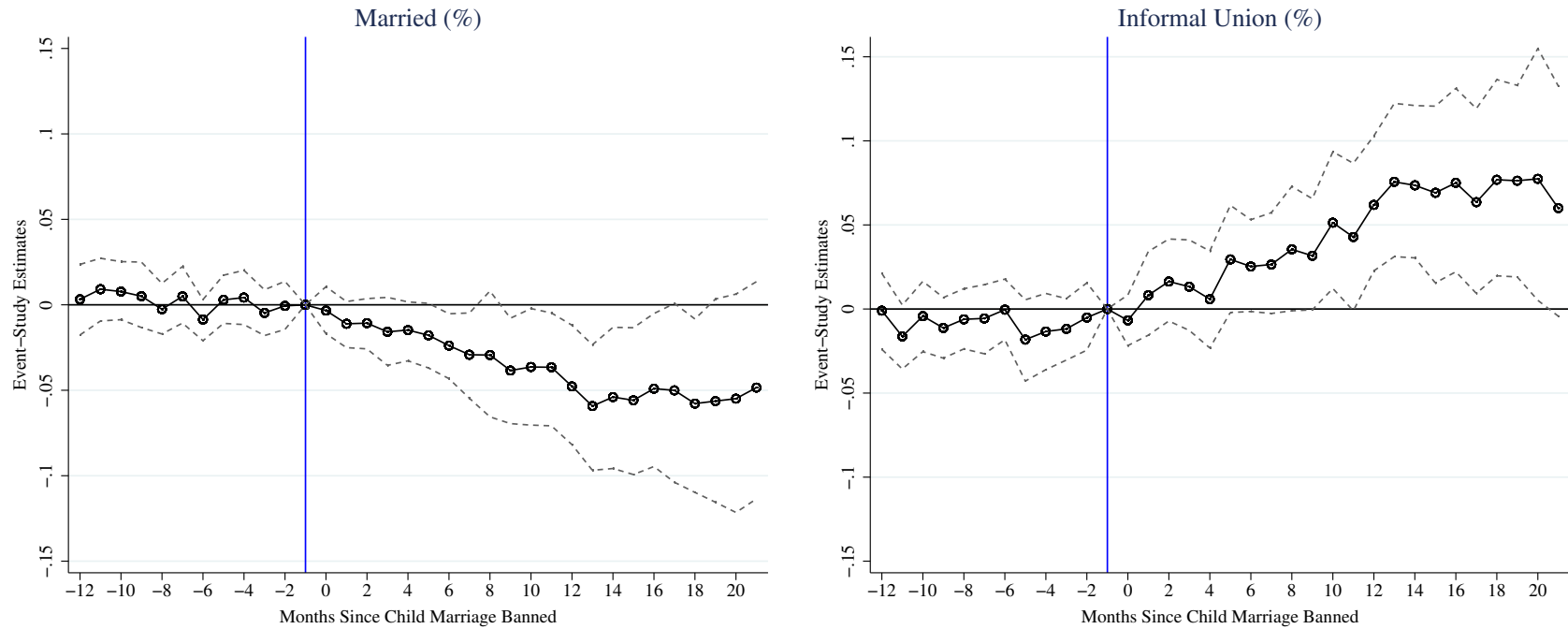
Notes: The sample is composed of all 14 to 17 year-old girls in ENOE in 2007-2018. This figure plots the coefficients and 95% confidence intervals based on wild-bootstrap clustered standard errors of a regression in which the dependent variable is a dummy for whether the individual attended school or completed high school at the moment of the survey. The regressors of interest are dummy variables for each quarter relative to the period in which child marriage was banned in the girl's state of residence, with the quarter before the reform being the omitted category. We only report 5 lead coefficients for ease of interpretation, and 7 lag coefficients because there are few states for which more than 7 quarters have passed since the reform was enacted. The regression also includes state fixed effects, quarter-year fixed effects, states' unemployment rate, poverty rate, female labor force participation, average income of employed individuals, population (in ln), dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party, age dummies, and locality-size dummies. Standard errors are clustered at the state level.

Figure 8: Effect of Banning Child Marriage on Early Motherhood – 16 and 17-Year-Old Girls



Notes: The sample includes all Mexican states in 2007-2017, and the unit of observation is a month-state. This figure plots the coefficients and 95% confidence intervals based on wild-bootstrap clustered standard errors of a regression in which the dependent variable is the monthly number of (live) first births conceived in that month, per 1,000 girls ages 16-17 who reside in that state. The regressors of interest are dummy variables for each month relative to the period in which child marriage was banned in state s , with the month before the reform being the omitted category. We only report 12 lead coefficients for ease of interpretation, and 12 lag coefficients because there are few states for which more than 12 months have passed since the reform was enacted. The regression also includes state fixed effects, month-year fixed effects, states' unemployment rate, poverty rate, female labor force participation, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors are clustered at the state level.

Figure 9: Effect of Banning Child Marriage on Civil Status of 16-17-Year Old Mothers



Notes: The sample includes all Mexican states in 2007-2017, and the unit of observation is a month-state. These figures plot the coefficients and 95% confidence intervals based on wild-bootstrap clustered standard errors of a regression in which the dependent variable is the percentage of deliveries from girls ages 16-17 that are in a marriage and civil union at the moment of birth, respectively. The regressors of interest are dummy variables equal to 1 if child marriage will be banned in state s in m months (and zero otherwise). The regression also includes state fixed effects, month-year fixed effects, states' unemployment rate, poverty rate, female labor force participation, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors are clustered at the state level.

Table 1: Background Characteristics of Women Aged 20-30 in 2013 by their Civil Status as Children

	Civil Status Before Age 18		
	Formally Married	Informal Union	Single
<i>Indigenous Group</i>			
Belongs to indigenous group	0.157	0.176	0.092
Speaks indigenous language	0.093	0.087	0.051
Father speaks indigenous language	0.146	0.141	0.095
Mother speaks indigenous language	0.123	0.127	0.092
<i>Father's Educational Attainment</i>			
Less than primary school	0.242	0.202	0.099
Primary school	0.384	0.364	0.396
Middle school	0.114	0.112	0.171
Secondary school	0.183	0.149	0.256
Tertiary/University	0.059	0.090	0.157
Missing	0.132	0.196	0.092
<i>Mother's Educational Attainment</i>			
Less than primary school	0.185	0.242	0.134
Primary school	0.508	0.454	0.422
Middle school	0.153	0.142	0.196
Secondary school	0.202	0.186	0.318
Tertiary/University	0.019	0.034	0.089
Missing	0.083	0.081	0.027
<i>Household Assets and Housing Quality at Age 14</i>			
Durable asset index (0-1)	0.393	0.372	0.554
Housing quality index (0-1)	0.436	0.424	0.615
Agricultural asset index (0-1)	0.122	0.109	0.097
Had a domestic worker	0.011	0.017	0.075
<i>Other Characteristics</i>			
Attended school at age 14	0.735	0.710	0.903
Attended middle school at age 14	0.624	0.596	0.851
Went to a private primary school	0.007	0.002	0.068
Worked at age 14	0.127	0.168	0.080
Domestic work at home age 14	0.563	0.483	0.365
At least one parent worked in agriculture	0.356	0.279	0.171
Number of siblings (by mother)	5.234	5.526	4.591
Observations	357	570	3,511

Notes: These data were taken from the *Encuesta Demográfica Retrospectiva* (EDER), a nationally representative demographic survey conducted in 2017. We took the sample of 4,438 women who were 24-34 at the time of the survey (i.e., 20-30 in 2013), divided them into three groups according to their civil status before the age of 18, and computed averages for each group using sampling weights. Column 1 includes all women who were formally married before the age of 18, and column 2 includes those that were in an informal union (but not formally married). Column 3 includes women who were not formally married or in an informal union at any point before the age of 18. We computed the *Durable asset index* variable for whether the household in which the woman lived at the age of 14 had a television, car, stove, refrigerator, washing machine, blender, record player, phone, computer, camera, and encyclopedia. *HH quality index* is an index we constructed for whether the house in which the respondent lived at age 18 had piped water, a ceiling made of tiles, an interior bathroom, and was located in a paved street. *Agricultural asset index* is an index for whether the house in which the woman lived at age 14 had livestock used for traction, cattle, and a tractor.

Table 2: Effect of Banning Child Marriage on Formal Child Marriage Rates

	(1)	(2)	(3)	(4)	(5)
Child Marriage Banned	-0.265*** (0.082) [0.000]	-0.247*** (0.082) [0.000]	-0.404*** (0.100) [0.000]	-0.368*** (0.097) [0.000]	-0.333*** (0.089) [0.001]
Year FE	✓				
Month-year FE		✓	✓	✓	✓
State FE			✓	✓	✓
Controls				✓	✓
Population Weights					✓
Observations	4,608	4,608	4,608	4,608	4,608
R ²	0.373	0.406	0.756	0.769	0.762
Dependent Variable Mean	0.717	0.717	0.717	0.717	0.678

Notes: The sample includes all Mexican states in 2007-2018, and the unit of observation is a month-state. The dependent variable is the monthly number of marriages per 1,000 girls ages 14-17 who reside in that state, and the regressor of interest is a dummy for whether child marriage was not allowed in that given state and month. Controls include states' unemployment rate, poverty rate, labor force participation of females ages 20 and above, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors clustered by state are in parentheses, and cluster-robust wild-bootstrap p-values in square brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3: Effect of Banning Child Marriage on Formal Child Marriage Rates by Age Group

	# Marriages per 1000 girls of age			
	14	15	16	17
Child Marriage Banned	-0.006 (0.042) [0.930]	-0.043 (0.085) [0.690]	-0.631*** (0.168) [0.001]	-0.793*** (0.183) [0.001]
Month-year FE	✓	✓	✓	✓
State FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Observations	4,608	4,608	4,608	4,608
R ²	0.573	0.628	0.751	0.747
Dependent Variable Mean	0.117	0.329	1.047	1.384

Notes: The sample includes all Mexican states in 2007-2018, and the unit of observation is a month-state. The dependent variable is the monthly number of marriages per 1,000 girls from the age group specified in the column header who reside in that state. The regressor of interest is a dummy for whether child marriage was not allowed in that given state and month. Controls include states' unemployment rate, poverty rate, labor force participation of females ages 20 and above, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors clustered by state are in parentheses, and cluster-robust wild-bootstrap p-values in square brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4: Event-Study Estimates of the Effect of Banning Child Marriage on Formal Child Marriage Rates

	# Marriages per 1000 girls of age				
	14-17	14	15	16	17
Child Marriage Banned - Months [-12, -9]	0.042 (0.042) [0.334]	0.001 (0.017) [0.941]	-0.021 (0.035) [0.585]	0.096 (0.069) [0.189]	0.093 (0.081) [0.262]
Child Marriage Banned - Months [-8, -5]	0.020 (0.028) [0.467]	-0.000 (0.008) [0.988]	-0.009 (0.018) [0.623]	0.062 (0.040) [0.106]	0.026 (0.068) [0.703]
Child Marriage Banned - Months [0, 3]	-0.281*** (0.069) [0.000]	-0.018 (0.015) [0.256]	-0.065* (0.032) [0.068]	-0.443*** (0.134) [0.000]	-0.603*** (0.139) [0.000]
Child Marriage Banned - Months [4, 7]	-0.358*** (0.080) [0.000]	-0.018 (0.020) [0.447]	-0.081* (0.044) [0.097]	-0.588*** (0.153) [0.000]	-0.750*** (0.163) [0.000]
Child Marriage Banned - Months [8, 11]	-0.386*** (0.086) [0.000]	-0.018 (0.027) [0.549]	-0.082 (0.058) [0.211]	-0.634*** (0.158) [0.000]	-0.812*** (0.171) [0.000]
Child Marriage Banned - Months [12, 15]	-0.387*** (0.098) [0.000]	-0.011 (0.039) [0.861]	-0.062 (0.079) [0.493]	-0.657*** (0.165) [0.000]	-0.821*** (0.186) [0.000]
Child Marriage Banned - Months [16, 19]	-0.380*** (0.108) [0.001]	-0.010 (0.042) [0.855]	-0.057 (0.086) [0.581]	-0.645*** (0.178) [0.000]	-0.811*** (0.202) [0.000]
Month-year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓
Observations	4,608	4,608	4,608	4,608	4,608
R ²	0.770	0.575	0.630	0.752	0.748
Dependent Variable Mean	0.717	0.117	0.329	1.047	1.384

Notes: The sample includes all Mexican states in 2007-2018, and the unit of observation is a month-state. The dependent variable is the monthly number of marriages per 1,000 girls from the age group specified in the column header who reside in that state. The regressors of interest are dummy variables for each 4-month period relative to the period in which child marriage was banned in state s , with the period before the reform being the omitted category. We only report lead coefficients for up to 12 months before the reform for ease of interpretation, and lag coefficients for 23 months after the reform, as there are few states for which more than 24 months have passed since the reform was enacted. Controls include states' unemployment rate, poverty rate, labor force participation of females ages 20 and above, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors clustered by state are in parentheses, and cluster-robust wild-bootstrap p-values in square brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5: Event-Study Estimates of the Effect of Banning Child Marriage on School Enrollment

	Girls of age				
	14-17	14	15	16	17
Child Marriage Banned in 5 Quarter	-0.000 (0.005) [0.948]	0.000 (0.007) [0.957]	0.001 (0.007) [0.870]	-0.010 (0.012) [0.406]	0.007 (0.010) [0.455]
Child Marriage Banned in 4 Quarters	0.004 (0.004) [0.229]	0.007 (0.005) [0.178]	-0.003 (0.007) [0.652]	0.006 (0.009) [0.544]	0.009 (0.008) [0.286]
Child Marriage Banned in 3 Quarters	0.001 (0.004) [0.828]	0.003 (0.004) [0.465]	-0.006 (0.007) [0.465]	-0.001 (0.010) [0.890]	0.008 (0.009) [0.409]
Child Marriage Banned in 2 Quarters	-0.001 (0.002) [0.619]	0.000 (0.003) [0.923]	-0.006 (0.005) [0.287]	-0.003 (0.007) [0.614]	0.005 (0.008) [0.535]
Child Marriage Banned this Quarter	-0.000 (0.003) [0.906]	-0.002 (0.004) [0.661]	-0.002 (0.006) [0.775]	-0.002 (0.009) [0.802]	0.004 (0.007) [0.592]
Child Marriage Banned 1 Quarter Ago	-0.003 (0.004) [0.528]	-0.002 (0.006) [0.757]	-0.006 (0.008) [0.522]	-0.012 (0.008) [0.177]	0.010 (0.009) [0.265]
Child Marriage Banned 2 Quarters Ago	-0.005 (0.005) [0.349]	-0.003 (0.006) [0.658]	-0.003 (0.007) [0.745]	-0.012 (0.012) [0.323]	0.001 (0.008) [0.886]
Child Marriage Banned 3 Quarters Ago	-0.007 (0.005) [0.260]	-0.008 (0.007) [0.278]	0.002 (0.008) [0.797]	-0.010 (0.010) [0.369]	-0.011 (0.009) [0.232]
Child Marriage Banned 4 Quarters Ago	-0.011 (0.007) [0.147]	-0.015* (0.008) [0.074]	0.001 (0.010) [0.891]	-0.014 (0.013) [0.342]	-0.016* (0.008) [0.074]
Child Marriage Banned 5 Quarters Ago	-0.012 (0.008) [0.211]	-0.014 (0.009) [0.180]	-0.017 (0.013) [0.236]	-0.007 (0.015) [0.660]	-0.009 (0.011) [0.451]
Child Marriage Banned 6 Quarters Ago	-0.011 (0.008) [0.161]	-0.010 (0.008) [0.263]	-0.011 (0.011) [0.381]	-0.007 (0.014) [0.631]	-0.016 (0.011) [0.165]
Child Marriage Banned 7 Quarters Ago	-0.018** (0.009) [0.058]	-0.017* (0.009) [0.086]	-0.016 (0.012) [0.216]	-0.020 (0.014) [0.194]	-0.017 (0.015) [0.283]
Month-year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓
Observations	713,451	175,375	182,177	178,717	177,182
R ²	0.082	0.025	0.039	0.051	0.053
Dependent Variable Mean	0.813	0.927	0.850	0.768	0.711

Notes: The sample is composed of girls of the age specified in the column header, taken from ENOE in 2007-2018. The dependent variable is a dummy for whether the individual attended school or completed high school at the moment of the survey. The regressors of interest are dummy variables for each quarter relative to the period in which child marriage was banned in the girl's state of residence, with the quarter before the reform being the omitted category. We only report 5 lead coefficients for ease of interpretation, and 7 lag coefficients because there are few states for which more than 7 quarters have passed since the reform was enacted. The regression also includes state fixed effects, quarter-year fixed effects, states' unemployment rate, poverty rate, female labor force participation, average income of employed individuals, population (in ln), dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party, age dummies, and locality-size dummies. Standard errors clustered by state are in parentheses, and cluster-robust wild-bootstrap p-values in square brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6: Event-Study Estimates of the Effect of Banning Child Marriage on Early Motherhood

	# First Births per 1000 girls of age					
	14-17	16-17	14	15	16	17
Child Marriage Banned - Months [-12, -9]	-0.013 (0.054) [0.792]	-0.039 (0.083) [0.638]	0.055 (0.040) [0.177]	-0.035 (0.084) [0.679]	-0.082 (0.099) [0.410]	0.004 (0.104) [0.967]
Child Marriage Banned - Months [-8, -5]	0.088 (0.062) [0.172]	0.090 (0.081) [0.294]	0.111** (0.049) [0.031]	0.060 (0.096) [0.562]	0.072 (0.092) [0.433]	0.107 (0.093) [0.257]
Child Marriage Banned - Months [0, 3]	-0.028 (0.050) [0.562]	-0.059 (0.074) [0.420]	0.054 (0.046) [0.272]	-0.049 (0.087) [0.601]	-0.126 (0.088) [0.152]	0.010 (0.086) [0.929]
Child Marriage Banned - Months [4, 7]	0.060 (0.080) [0.460]	0.089 (0.110) [0.443]	0.066 (0.053) [0.257]	-0.001 (0.104) [0.988]	0.050 (0.115) [0.668]	0.128 (0.126) [0.319]
Child Marriage Banned - Months [8, 11]	0.088 (0.060) [0.154]	0.141 (0.086) [0.120]	0.088 (0.054) [0.121]	-0.012 (0.102) [0.931]	0.102 (0.108) [0.371]	0.180* (0.101) [0.087]
Month-year FE	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Observations	3,616	3,616	3,616	3,616	3,616	3,616
R ²	0.814	0.794	0.561	0.650	0.704	0.732
Dependent Variable Mean	4.035	5.480	1.649	3.541	5.114	5.848

Notes: The sample includes all Mexican states in 2007-2017, and the unit of observation is a month-state. The dependent variable is the monthly number of (live) first births conceived in that month, per 1,000 girls from the age group specified in the column header who reside in that state. The regressors of interest are dummy variables for each 4-month period relative to the period in which child marriage was banned in state s , with the period before the reform being the omitted category. We only report lead coefficients for up to 12 months before the reform for ease of interpretation, and lag coefficients for 12 months after the reform, as there are few states for which more than 12 months have passed since the reform was enacted. Controls include states' unemployment rate, poverty rate, labor force participation of females ages 20 and above, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors clustered by state are in parentheses, and cluster-robust wild-bootstrap p-values in square brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 7: Event-Study Estimates of the Effect of Banning Child Marriage on Civil Status of 16-17-Year Old Mothers

	Civil Status of Mothers of age age 16-17			
	Married	Union	Single	Missing
Child Marriage Banned - Months [-12, -9]	0.006 (0.006) [0.277]	-0.001 (0.007) [0.948]	0.003 (0.006) [0.698]	-0.009*** (0.002) [0.001]
Child Marriage Banned - Months [-8, -5]	-0.001 (0.004) [0.814]	0.000 (0.006) [0.949]	0.006 (0.005) [0.303]	-0.005*** (0.001) [0.000]
Child Marriage Banned - Months [0, 3]	-0.010 (0.007) [0.199]	0.015* (0.009) [0.090]	-0.008 (0.006) [0.233]	0.002 (0.002) [0.316]
Child Marriage Banned - Months [4, 7]	-0.021* (0.010) [0.066]	0.029** (0.012) [0.027]	-0.010 (0.009) [0.299]	0.002 (0.003) [0.522]
Child Marriage Banned - Months [8, 11]	-0.035** (0.017) [0.049]	0.047** (0.018) [0.013]	-0.015 (0.010) [0.184]	0.002 (0.003) [0.473]
Child Marriage Banned - Months [12, 15]	-0.053** (0.020) [0.010]	0.077*** (0.021) [0.000]	-0.026** (0.012) [0.039]	0.002 (0.004) [0.667]
Child Marriage Banned - Months [16, 20]	-0.052** (0.025) [0.044]	0.080*** (0.026) [0.002]	-0.028* (0.014) [0.058]	0.000 (0.003) [0.915]
Month-year FE	✓	✓	✓	✓
State FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Observations	3,840	3,840	3,840	3,840
R ²	0.844	0.766	0.736	0.460
Dependent Variable Mean	0.158	0.615	0.207	0.019

Notes: The sample includes all Mexican states in 2007-2017, and the unit of observation is a month-state. The dependent variable is the share of 16-17 year old mothers residing in a given state and who gave birth in a given month that had the civil status in the column header at the moment of delivery. The regressors of interest are dummy variables for each 4-month period relative to the period in which child marriage was banned in state s , with the period before the reform being the omitted category. We only report lead coefficients for up to 21 months before the reform for ease of interpretation, and lag coefficients for 21 months after the reform, as there are few states for which more than 12 months have passed since the reform was enacted. Controls include states' unemployment rate, poverty rate, labor force participation of females ages 20 and above, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors clustered by state are in parentheses, and cluster-robust wild-bootstrap p-values in square brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

8 Appendix Figures and Tables

Figure A.1: Progressive Adoption of Child Marriage Ban

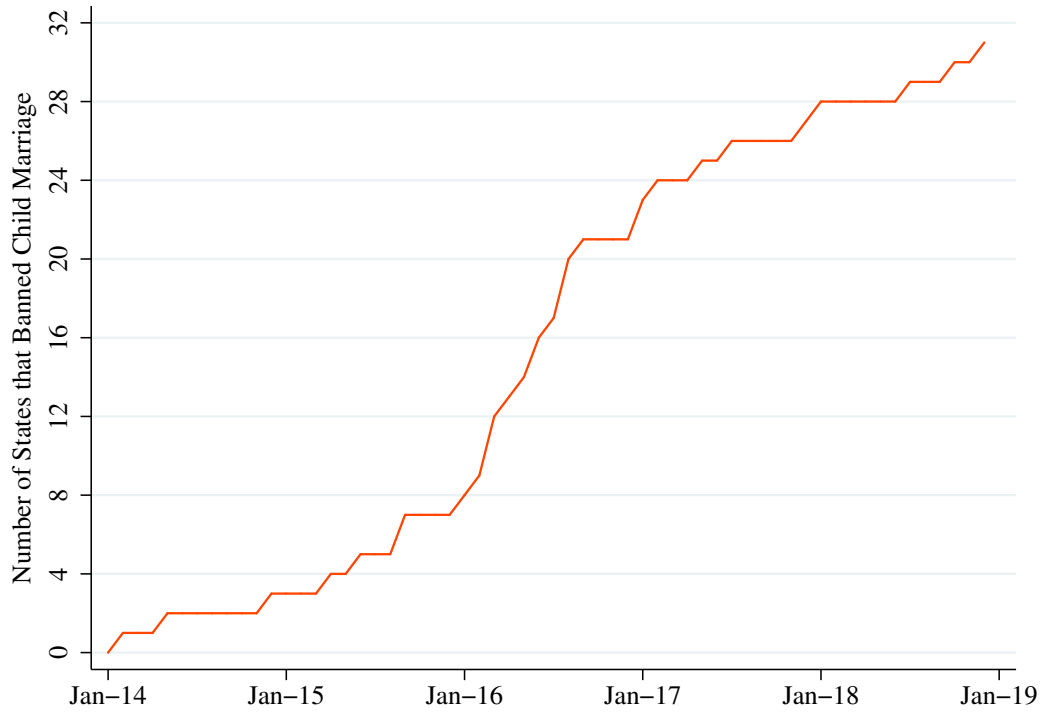
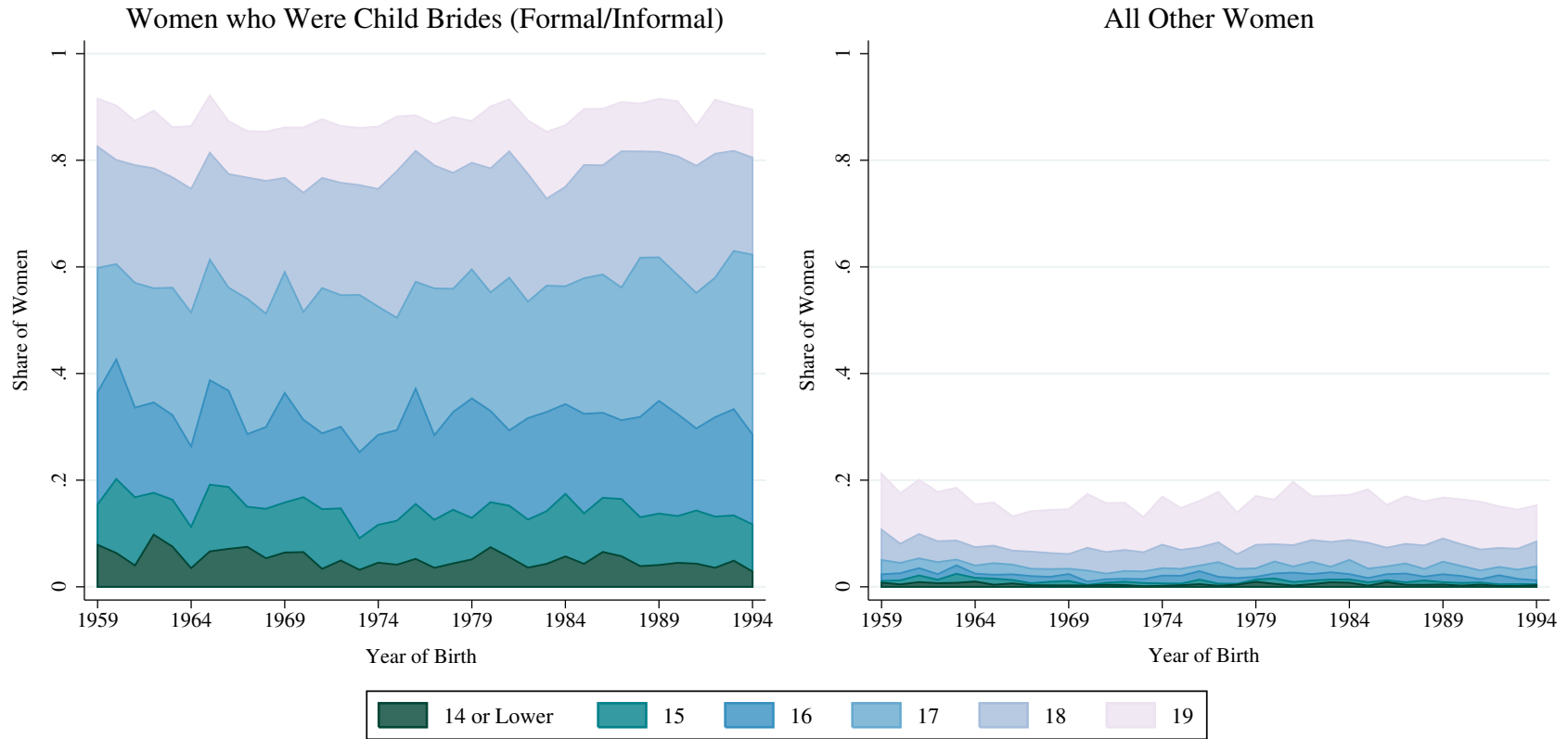
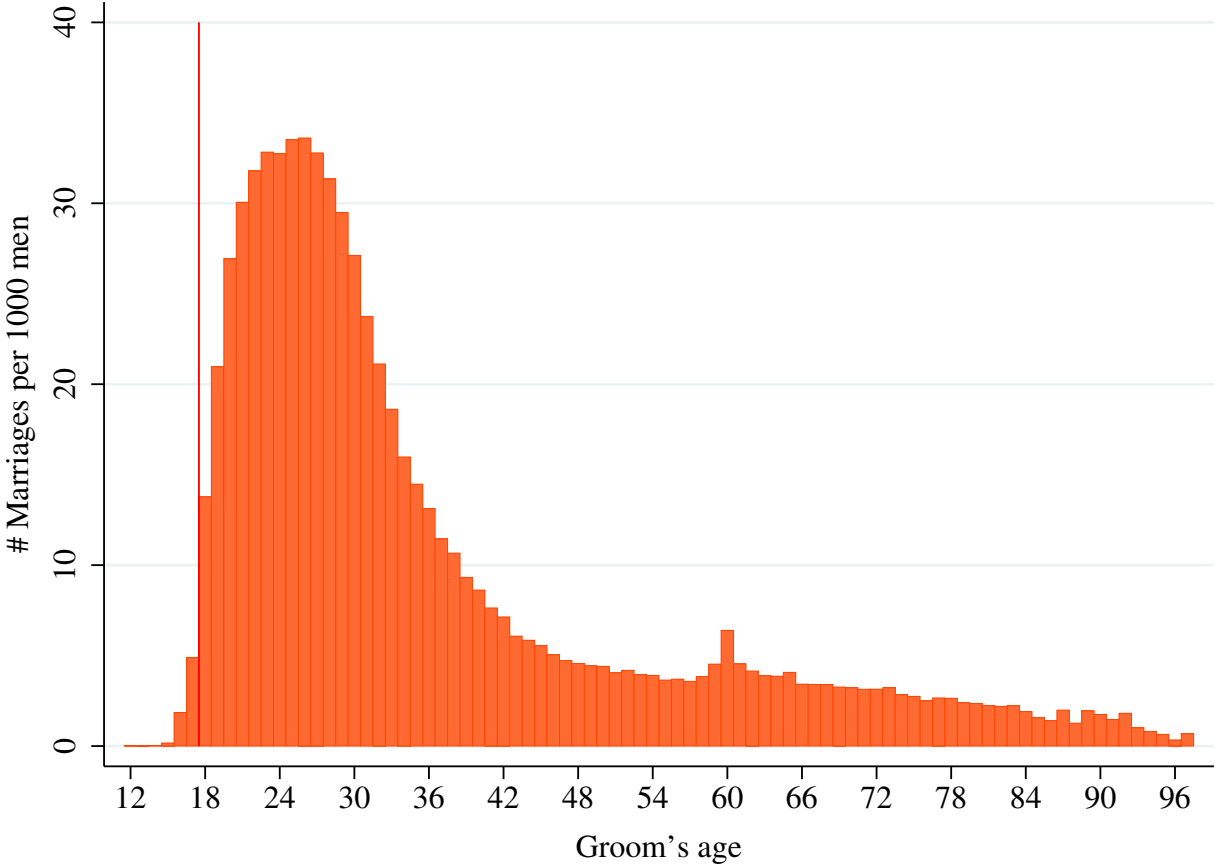


Figure A.2: Comparison of Age at First Birth for Child Brides and Non-Child Brides



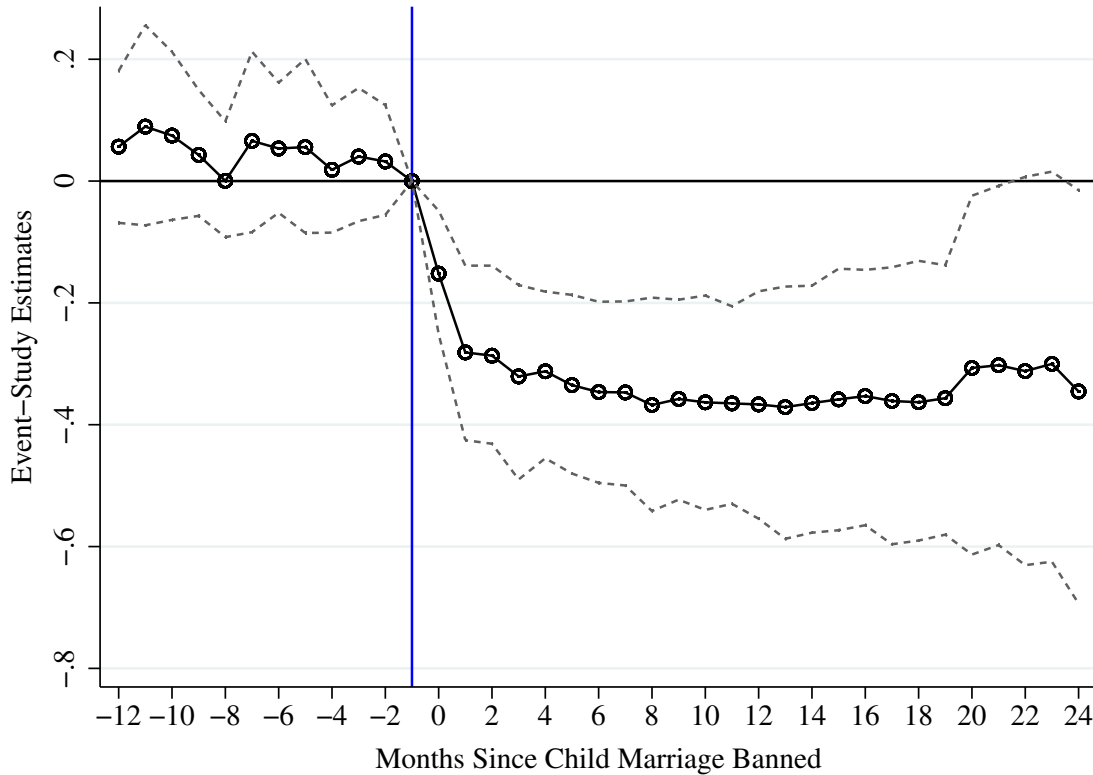
Notes: The graphs show the share of women who had their first birth at different ages, by cohort. The sample in the first graph is limited to women who were in a formal marriage or informal union before the age of 18, whereas the sample in the second group includes the remaining women (i.e., those who were not in a formal marriage or informal union before turning 18). The source of these data is the *Encuesta Nacional de la Dinámica Demográfica* (ENADID), a demographic survey conducted in 2014. We took the sample of 83,554 women who were 20-54 at the time of the survey, and computed the share of women in each category using sampling weights.

Figure A.3: Number of Registered Marriages per 1,000 Boys and Men in 2013, by the Groom's Age



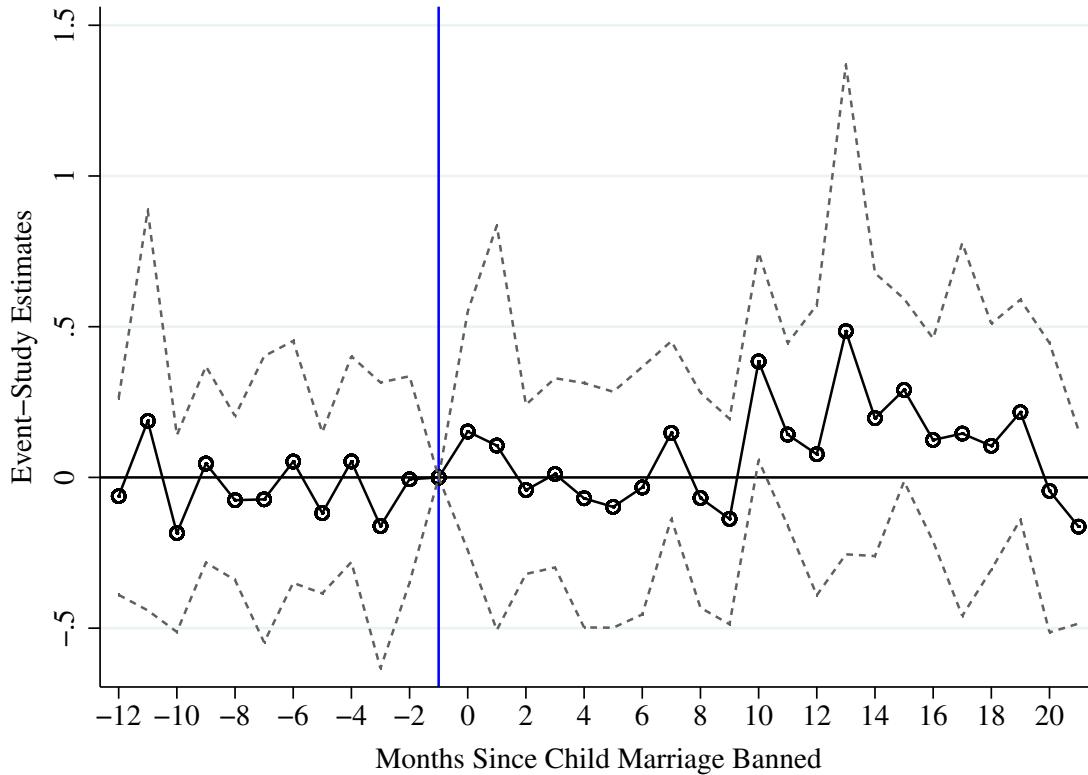
Notes: This figure depicts the number of legally registered marriages by the age of the groom, per 1,000 boys and men of each age in 2013. The number of marriages was obtained from marriage certificate microdata, and the population from CONAPO.

Figure A.4: Event-Study Estimates of the Effect of Banning Child Marriage on Formal Marriage Rates – 14 to 17-Year-Old Girls



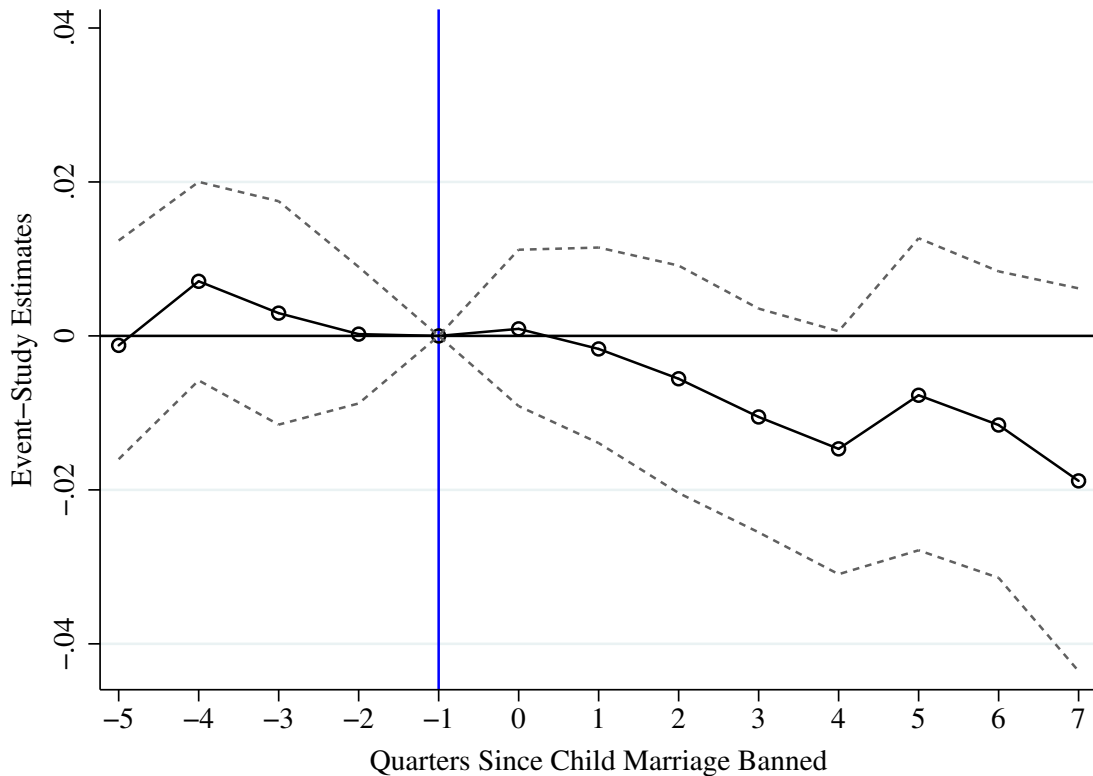
Notes: The sample includes all Mexican states in 2007-2018, and the unit of observation is a month-state. The figure plots the coefficients and 95% confidence intervals based on wild-bootstrap clustered standard errors of a regression in which the dependent variable is the monthly number of marriages per 1,000 girls ages 14-17 who reside in a state s in month-year t . The regressors of interest are dummy variables for each month relative to the period in which child marriage was banned in state s , with the month before the reform being the omitted category. We only report 12 lead coefficients for ease of interpretation, and 24 lag coefficients because there are few states for which more than 24 months have passed since the reform was enacted. The regression also includes state fixed effects, month-year fixed effects, states' unemployment rate, poverty rate, labor force participation of females ages 20 and above, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors are clustered at the state level.

Figure A.5: Event-Study Estimates of the Effect of Banning Child Marriage on Formal Marriage Rates – 18-Year-Old Girls



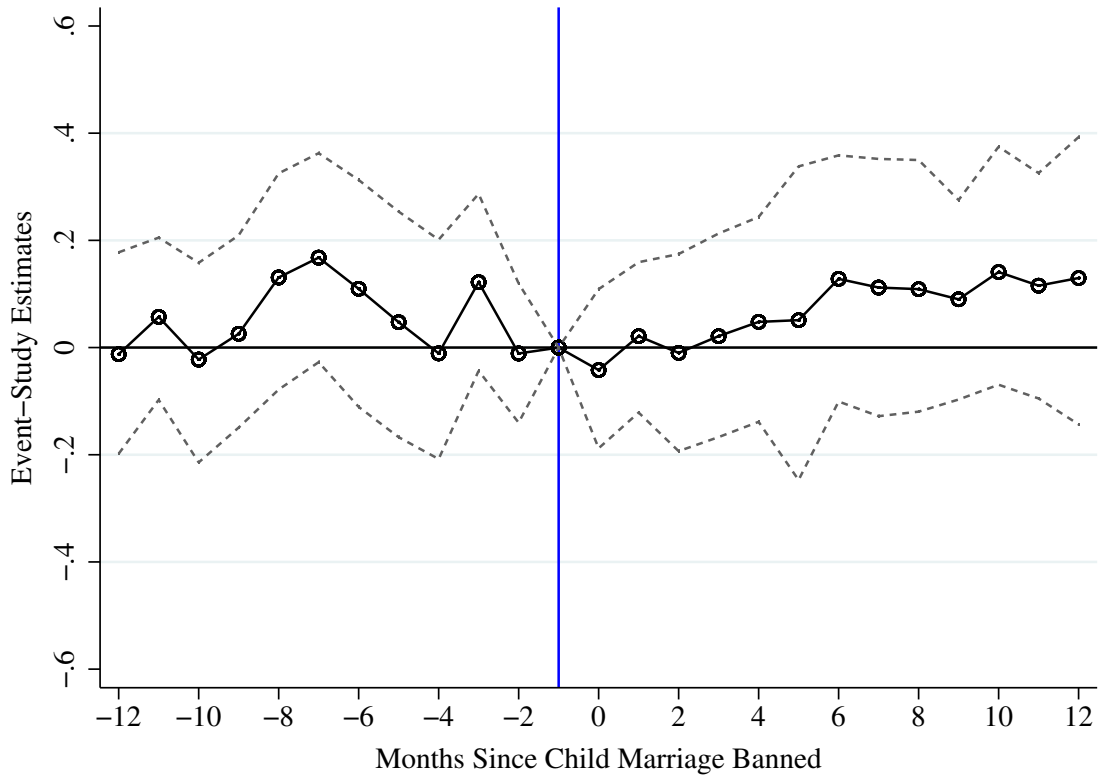
Notes: The sample includes all Mexican states in 2007-2018, and the unit of observation is a month-state. The figure plots the coefficients and 95% confidence intervals based on wild-bootstrap clustered standard errors of a regression in which the dependent variable is the monthly number of marriages per 1,000 girls of age 18 who reside in a state s in month-year t . The regressors of interest are dummy variables for each month relative to the period in which child marriage was banned in state s , with the month before the reform being the omitted category. We only report 12 lead coefficients for ease of interpretation, and 24 lag coefficients because there are few states for which more than 24 months have passed since the reform was enacted. The regression also includes state fixed effects, month-year fixed effects, states' unemployment rate, poverty rate, labor force participation of females ages 20 and above, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors are clustered at the state level.

Figure A.6: Effect of Banning Child Marriage on School Enrollment – 16 to 17-Year-Old Girls



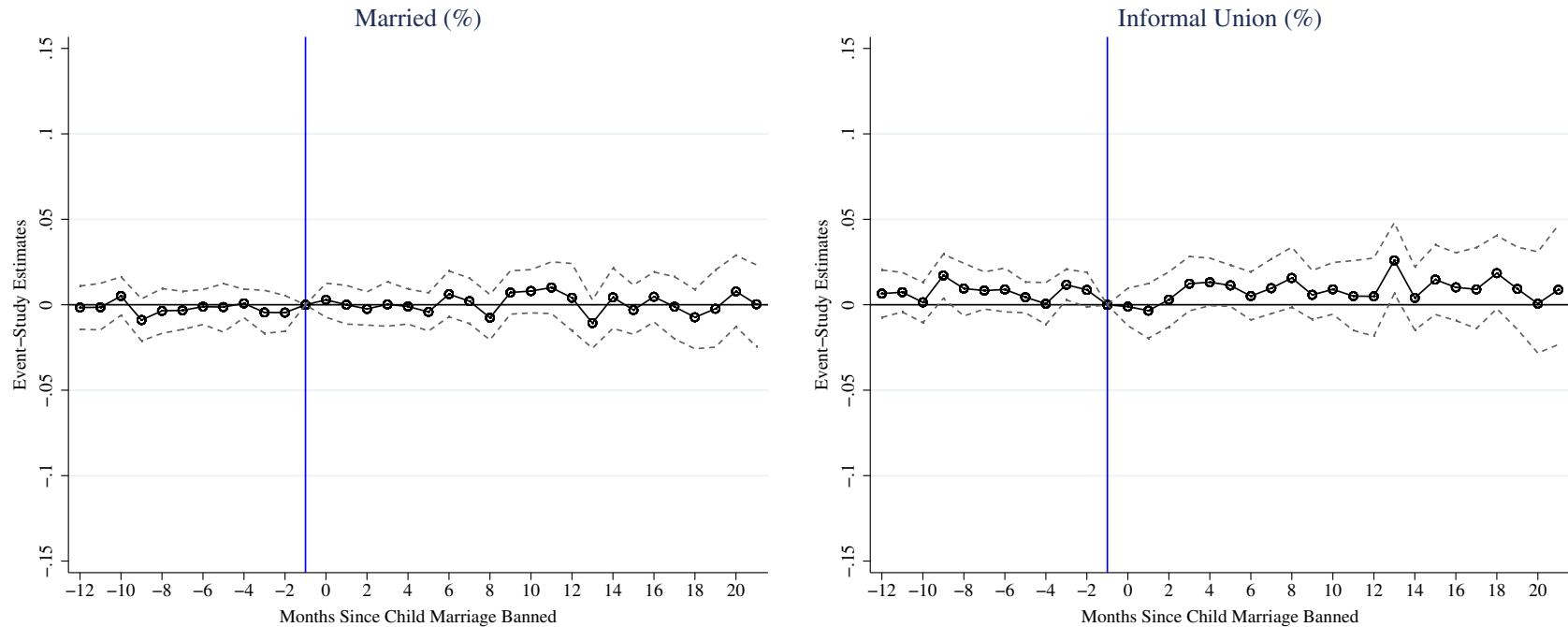
Notes: The sample is composed of all 16 to 17 year-old girls in ENOE in 2007-2018. This figure plots the coefficients and 95% confidence intervals based on wild-bootstrap clustered standard errors of a regression in which the dependent variable is a dummy for whether the individual attended school or completed high school at the moment of the survey. The regressors of interest are dummy variables for each quarter relative to the period in which child marriage was banned in the girl's state of residence, with the quarter before the reform being the omitted category. We only report 5 lead coefficients for ease of interpretation, and 7 lag coefficients because there are few states for which more than 7 quarters have passed since the reform was enacted. The regression also includes state fixed effects, quarter-year fixed effects, states' unemployment rate, poverty rate, female labor force participation, average income of employed individuals, population (in ln), dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party, age dummies, and locality-size dummies. Standard errors are clustered at the state level.

Figure A.7: Effect of Banning Child Marriage on Early Motherhood – 14 to 17-Year-Old Girls



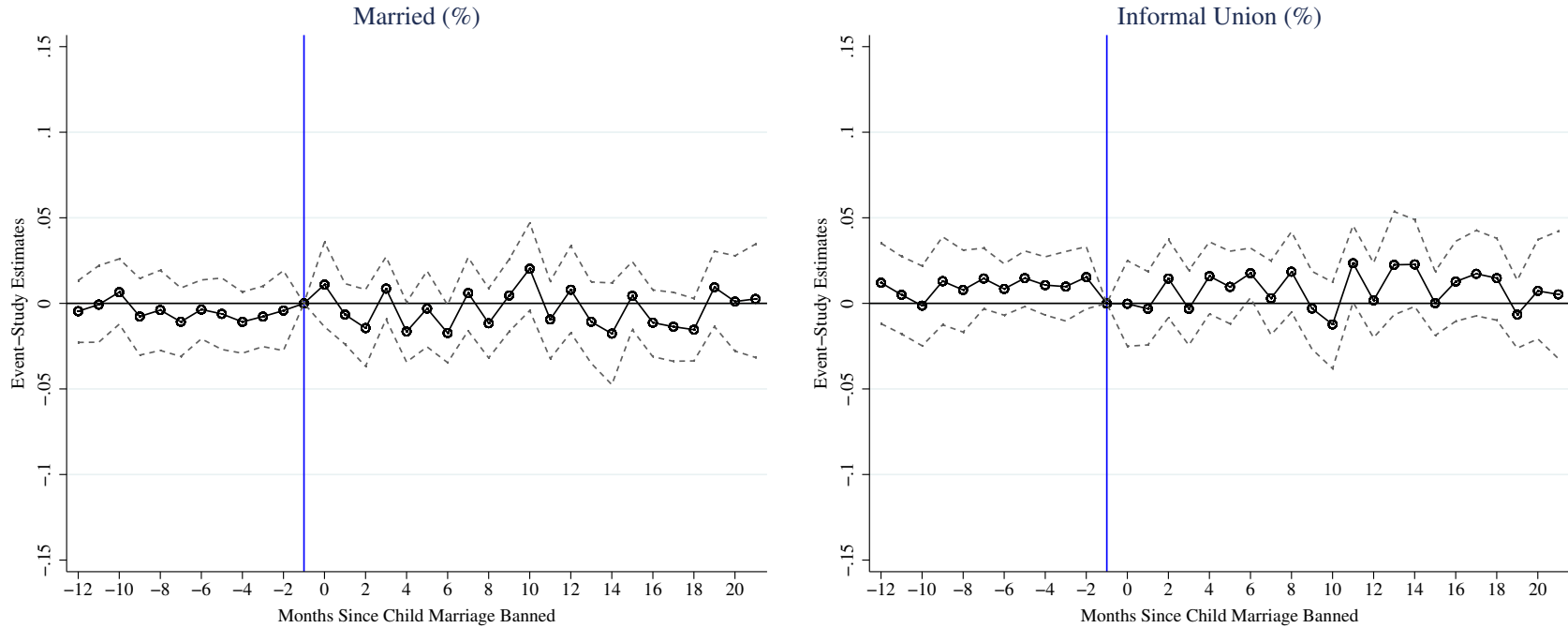
Notes: The sample includes all Mexican states in 2007-2017, and the unit of observation is a month-state. This figure plots the coefficients and 95% confidence intervals based on wild-bootstrap clustered standard errors of a regression in which the dependent variable is the monthly number of (live) first births conceived in that month, per 1,000 girls ages 16-17 who reside in that state. The regressors of interest are dummy variables for each month relative to the period in which child marriage was banned in state s , with the month before the reform being the omitted category. We only report 12 lead coefficients for ease of interpretation, and 12 lag coefficients because there are few states for which more than 12 months have passed since the reform was enacted. The regression also includes state fixed effects, month-year fixed effects, states' unemployment rate, poverty rate, female labor force participation, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors are clustered at the state level.

Figure A.8: Effect of Banning Child Marriage on Civil Status of 19-24-Year Old Mothers



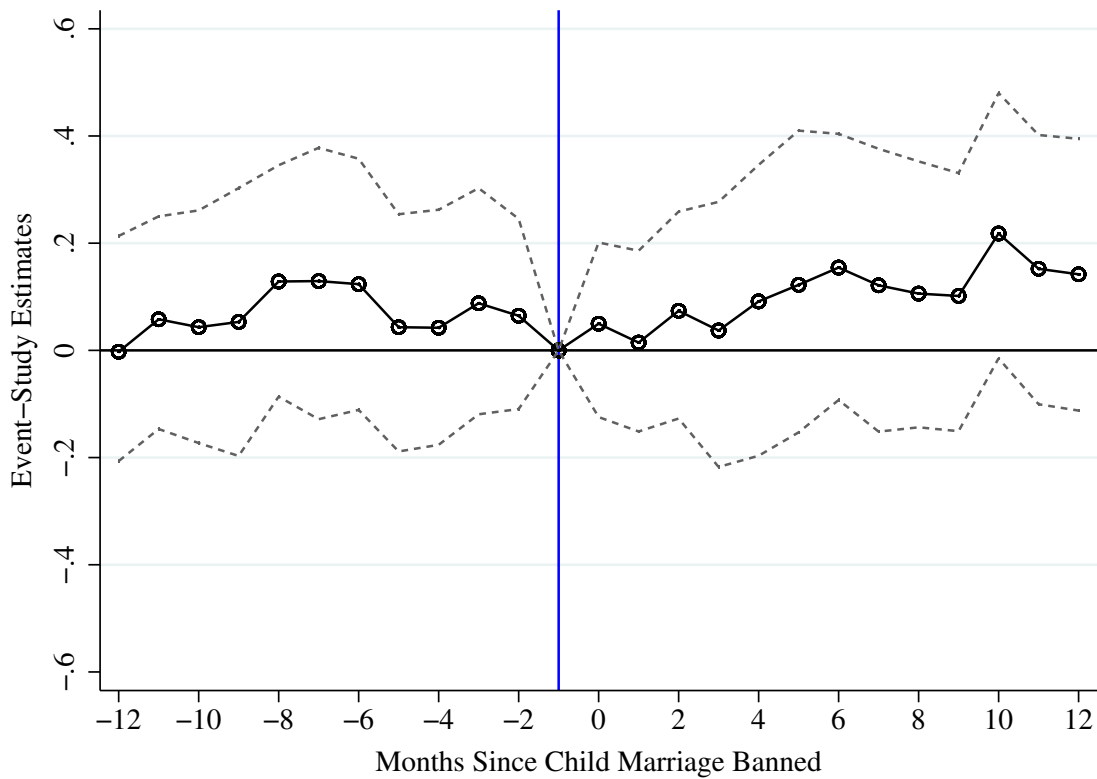
Notes: The sample includes all Mexican states in 2007-2017, and the unit of observation is a month-state. These figures plot the coefficients and 95% confidence intervals based on wild-bootstrap clustered standard errors of a regression in which the dependent variable is the percentage of deliveries from women ages 19-24 that are in a marriage and civil union at the moment of birth, respectively. The regressors of interest are dummy variables for each month relative to the period in which child marriage was banned in state s , with the month before the reform being the omitted category. We only report 12 lead coefficients for ease of interpretation, and 21 lag coefficients because there are few states for which more than 21 months have passed since the reform was enacted. The regression also includes state fixed effects, month-year fixed effects, states' unemployment rate, poverty rate, female labor force participation, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors are clustered at the state level.

Figure A.9: Effect of Banning Child Marriage on Civil Status of 25-29-Year Old Mothers



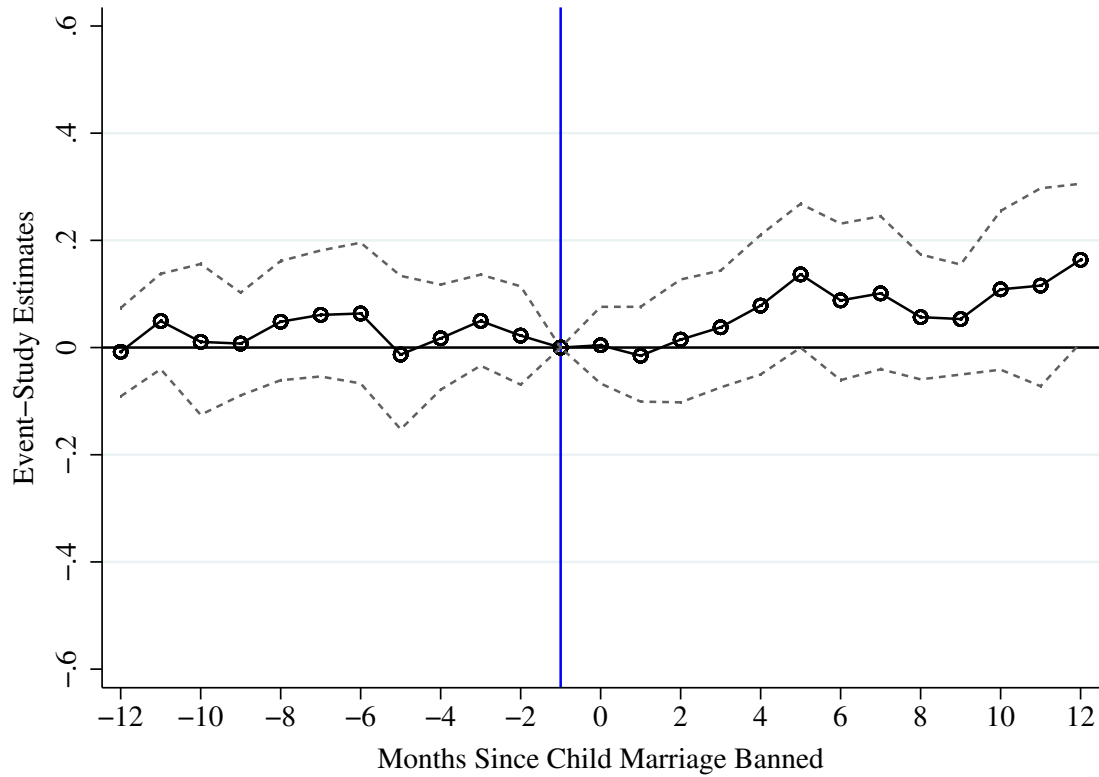
Notes: The sample includes all Mexican states in 2007-2017, and the unit of observation is a month-state. These figures plot the coefficients and 95% confidence intervals based on wild-bootstrap clustered standard errors of a regression in which the dependent variable is the percentage of deliveries from women ages 25-29 that are in a marriage and civil union at the moment of birth, respectively. The regressors of interest are dummy variables for each month relative to the period in which child marriage was banned in state s , with the month before the reform being the omitted category. We only report 12 lead coefficients for ease of interpretation, and 21 lag coefficients because there are few states for which more than 21 months have passed since the reform was enacted. The regression also includes state fixed effects, month-year fixed effects, states' unemployment rate, poverty rate, female labor force participation, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors are clustered at the state level.

Figure A.10: Effect of Banning Child Marriage on Fertility Rates of 19-24-Year Old Women



Notes: The sample includes all Mexican states in 2007-2017, and the unit of observation is a month-state. This figure plots the coefficients and 95% confidence intervals based on wild-bootstrap clustered standard errors of a regression in which the dependent variable is the monthly number of (live) first births conceived in that month, per 1,000 women ages 19-24 who reside in that state. The regressors of interest are dummy variables for each month relative to the period in which child marriage was banned in state s , with the month before the reform being the omitted category. We only report 12 lead coefficients for ease of interpretation, and 12 lag coefficients because there are few states for which more than 12 months have passed since the reform was enacted. The regression also includes state fixed effects, month-year fixed effects, states' unemployment rate, poverty rate, female labor force participation, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors are clustered at the state level.

Figure A.11: Effect of Banning Child Marriage on Fertility Rates of 25-29-Year Old Women



Notes: The sample includes all Mexican states in 2007-2017, and the unit of observation is a month-state. This figure plots the coefficients and 95% confidence intervals based on wild-bootstrap clustered standard errors of a regression in which the dependent variable is the monthly number of (live) first births conceived in that month, per 1,000 women ages 25-29 who reside in that state. The regressors of interest are dummy variables for each month relative to the period in which child marriage was banned in state s , with the month before the reform being the omitted category. We only report 12 lead coefficients for ease of interpretation, and 12 lag coefficients because there are few states for which more than 12 months have passed since the reform was enacted. The regression also includes state fixed effects, month-year fixed effects, states' unemployment rate, poverty rate, female labor force participation, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors are clustered at the state level.

Table A.1: Dates and Relevant Legislation for Child Marriage Ban

State	Date of Child Marriage Ban	Source
Aguascalientes	February 22, 2016	Civil code: articles 145 and 153
Baja California		
Baja California Sur	May 29, 2014	Civil code: articles 157, 163 and 164
Campeche	May 16, 2016	Civil code: articles 159 and 167
Coahuila de Zaragoza	September 4, 2015	Family code: articles 141 and 143
Colima	September 8, 2016	Civil code: articles 148 and 156
Chiapas	April 6, 2016	Civil code: articles 145 and 153
Chihuahua	December 23, 2017	Civil code: articles 136 and 144
Mexico City	July 13, 2016	Civil code: articles 148 and 156
Durango	February 26, 2017	Civil code: articles 143 and 151
Guanajuato	July 5, 2018	Civil code: articles 145 and 153
Guerrero	May 9, 2017	Civil code: articles 412 and 417
Hidalgo	December 31, 2016	Family code: articles 12 and 19
Jalisco	April 4, 2015	Civil code: articles 260 and 268
Mexico	March 14, 2016	Civil code: articles 4.4 and 4.7
Michoacan	June 22, 2016	Family code: articles 133 and 141
Morelos	August 17, 2016	Family code: articles 72 and 77
Nayarit	March 11, 2016	Civil code: articles 144 and 152
Nuevo Leon	January 8, 2018	Civil code: articles 148 and 156
Oaxaca	December 31, 2015	Civil code: articles 147 and 156
Puebla	March 28, 2016	Civil code: articles 299 and 300
Queretaro	October 17, 2018	Civil code: articles 140 and 148
Quintana Roo	December 19, 2014	Civil code: article 697
San Luis Potosi	September 17, 2015	Family code: article 21
Sinaloa	August 19, 2016	Family code: articles 43, 57 and 58
Sonora	December 14, 2018	Family code: articles 15 and 22
Tabasco	July 1, 2017	Civil code: articles 154 and 160
Tamaulipas	June 23, 2016	Civil code: articles 132 and 138
Tlaxcala	December 30, 2016	Civil code: articles 43 and 46
Veracruz	February 3, 2014	Civil code: articles 86 and 92
Yucatan	June 12, 2015	Family code: articles 54 and 59
Zacatecas	August 17, 2016	Family code: articles 106 and 114

Table A.2: Effect of Banning Child Marriage on Child Marriage Rates – Migration and Groom’s State of Residence

	# Marriages per 1000 girls of age				
	14-17	14	15	16	17
Panel A: State where marriage happened					
Child Marriage Banned	-0.377*** (0.094) [0.000]	-0.002 (0.043) [0.977]	-0.030 (0.086) [0.797]	-0.666*** (0.168) [0.001]	-0.813*** (0.178) [0.000]
Observations	4,608	4,608	4,608	4,608	4,608
R ²	0.764	0.565	0.621	0.746	0.742
Panel B: Groom’s state of residence					
Child Marriage Banned	-0.367*** (0.099) [0.002]	-0.009 (0.042) [0.889]	-0.042 (0.084) [0.687]	-0.634*** (0.170) [0.001]	-0.784*** (0.186) [0.000]
Observations	4,608	4,608	4,608	4,608	4,608
R ²	0.771	0.575	0.629	0.753	0.748
Month-year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓

Notes: The sample includes all Mexican states in 2007-2018, and the unit of observation is a month-state. The dependent variable in Panel A is the monthly number of marriages per 1,000 girls from the age group specified in the column header that took place in that state. The dependent variable in Panel B is the monthly number of marriages per 1,000 girls from the age group specified in the column header with a groom that resides in that state. The regressor of interest is a dummy for whether child marriage was not allowed in that given state and month. Controls include states’ unemployment rate, poverty rate, labor force participation of females ages 20 and above, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors clustered by state are in parentheses, and cluster-robust wild-bootstrap p-values in square brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A.3: Effect of Banning Child Marriage on Adults' Formal Marriage Rates

	# Marriages per 1000 women of age			
	19-24	25-29	30-34	35-39
Child Marriage Banned	-0.046 (0.078) [0.669]	-0.030 (0.048) [0.567]	-0.010 (0.027) [0.724]	0.003 (0.019) [0.881]
Month-year FE	✓	✓	✓	✓
State FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Observations	4,608	4,608	4,608	4,608
R ²	0.587	0.497	0.405	0.369
Dependent Variable Mean	2.747	2.146	1.092	0.607

Notes: The sample includes all Mexican states in 2007-2018, and the unit of observation is a month-state. The dependent variable is the monthly number of marriages per 1,000 women from the age group specified in the column header who reside in that state. The regressor of interest is a dummy for whether child marriage was not allowed in that given state and month. Controls include states' unemployment rate, poverty rate, labor force participation of females ages 20 and above, average income of employed individuals, population (in ln), and dummy variables for whether the state governor belongs to PRI, PAN, PRD or another political party. Standard errors clustered by state are in parentheses, and cluster-robust wild-bootstrap p-values in square brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.