The Effect of Abortion Legalization on Fertility, Marriage, and Long-term Outcomes for Women[ϰ]

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Abstract: We evaluate the short- and long-term effects for women of access to legal, subsidized abortion, by exploiting the Spanish legalization of abortion in 1985. We find robust evidence that the legalization led to an immediate decrease in the number of births, more pronounced for women aged 21 and younger. This effect was driven by provinces with a higher supply of abortion services. We also find that the affected cohorts of women were more likely to graduate from high school, less likely to marry young, less likely to divorce in the long-term, and reported higher life satisfaction as adults. We do not find significant effects on completed fertility, long-term labor market participation, employment, or earnings.

Keywords: Abortion, fertility, education, labor market outcomes, satisfaction

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1. Introduction

We provide causal evidence on the long-term effects of access to abortion on women's completed fertility, educational attainment, family formation, labor market outcomes, and subjective well-being. We exploit the legalization of abortion in Spain in 1985, comparing cohorts of women more or less affected based on their age in 1985, combined with geographical variation in the availability of abortion clinics in the initial years after legalization.

Access to contraception and family planning has important social implications. It allows women and families to achieve their desired fertility, as well as control its timing, which can affect family well-being through multiple channels. Access to abortion services can also have direct effects on women's health, e.g. if the alternatives to regulated abortion are unsafe.

Abortion is legal and even publicly subsidized in many countries.[1] Abortion regulation, however, remains a heated topic, and many countries have debated and/or reformed their abortion legislation in recent years. For instance, Ireland voted in favor of legalizing abortion in May 2018, while legalization was voted down in the Argentinian Senate in August 2018.

Previous literature using data for different countries has shown that easier access to abortion has short-term effects on birth-rates (Pop-Eleches 2010 for Romania; Levine et al. 1996, 1999, Joyce et al. 2013, and Bailey and Lindo 2017 for the US; Clarke and Mühlrad 2018 for Mexico), and may affect completed fertility (Gruber et al. 1999, Ananat et al. 2007, 2009). Recent work by Myers (2017) provides evidence that abortion legalization may have affected age at first marriage and age at first birth in the US. It has also been shown that easier abortion affects the characteristics and outcomes

[1] Abortion Policies and Reproductive Health, United Nations 2014.

of children born (Ananat et al. 2009, Gruber et al. 1999, Donohue and Levitt 2001, Pop-Eleches 2006).

A related recent literature suggests that access to oral contraception ("the pill") in the US had relevant effects on long-term outcomes for women, such as age at first marriage, human capital accumulation, and labor market participation (Goldin and Katz 2002, Bailey 2006, 2010, 2012).

We are unaware of previous studies providing causal evidence on the long-term effects of access to abortion on education and labor market outcomes for women. This may be due to identification problems. Abortion reforms usually take place at the national level, which complicates finding appropriate control groups. We address this challenge by combining the time variation provided by the legalization of abortion in Spain in 1985, with geographical variation in the availability of health centers that provided abortion services in the early years after legalization.[2]

Our approach focuses on women who were very young when abortion was legalized, so that they would have been able to avoid an early birth, unlike women who were older in 1985. The "treatment" of abortion legalization would have been stronger for women living near an abortion clinic, compared with those in a region where no health centers provided abortion services in the early years after legalization. We construct a new dataset of abortion clinics with their geographical location and years of operation, and follow a difference-in-differences approach, exploiting variation across cohorts and the availability of abortion clinics. We are able to follow women for up to 30 years after the legal reform. We exploit a range of data sources, from administrative

[2] A few recent papers have used distance to legal abortion providers in the US to study short-term effects of access to abortion services on abortion and birth rates (Joyce et al. 2013, Cunningham et al. 2017).

birth certificates to labor force survey data, in order to explore a range of short- and long-term outcomes.

The supply of abortion services in different locations may not be exogenous and reflect at least in part demand factors. In order to deal with this concern, we first provide evidence of parallel trends in fertility prior to the reform. In addition, we control directly for demand factors, such as religiosity and pre-existing teen birth rates at the local level, interacted with the reform, such that we are plausibly left with idiosyncratic variation in the supply of abortion services in an area.

We find that abortion legalization, combined with living close to an abortion clinic, led to a 6% short-term decline in birth-rates among women younger than 21. We find a delay in both first birth and marriage. We also find that women more affected by the reform were significantly more likely to graduate from high school. In the long term, we find that completed fertility is unaffected. Treated women are less likely to have ever married, and fewer of them report being divorced, suggesting better-quality matches. We find insignificant effects on long-term labor market outcomes (participation, employment, and earnings).

Our results are unlikely to be confounded by the impact of access to oral contraceptives, since their introduction and regulation in Spain precedes the regulation of abortion by several years. The pill started being sold in Spain on 1964, and it became legal as a contraceptive method in 1978, i.e. 7 years before the legalization of abortion. Our results survive a robustness check where we control for knowledge of and/or usage of the pill at the regional level.

Our findings suggest that the legal regulation of abortion can have important implications for women's lives, affecting the timing of family formation, as well as

educational attainment. Our interpretation is that those effects are overall positive, as suggested by our analysis of long-term, self-reported well-being.

The remainder of the paper is organized as follows. In the next section we describe the events that led to the legalization of abortion in Spain in 1985. In section 3 we evaluate the short-term effects of the legal change on fertility and marriage rates. Section 4 presents the results on long-term outcomes, and section 5 concludes.

2. The legalization of abortion in Spain

Abortion was banned in Spain until 1985. In October 1982, the Socialist Party won the national election with a large majority, and in January 1983 the Health Minister announced that abortion would be legalized. A draft of the law was approved in the national Parliament in October. However, in December 1983 the law was challenged by conservative legislators, and sent to court with the argument that it was unconstitutional. In April 1985, the High Court upheld the charges. However, the government announced that they would make some minor changes to the writing of the law in order to make it constitutional. In late May 1985, the new draft was approved in parliament. The law was finally passed in July, and became effective in August 1985.

Since August 1985, abortions were allowed when: 1) there was serious risk to the physical or mental health of the pregnant woman, 2) the woman became pregnant as a result of rape, provided that the abortion was performed within the first 12 weeks of gestation and the rape had been reported; or 3) there was risk of malformations or defects, physical or mental, in the fetus, provided that the interruption was done within the first 22 weeks of gestation. In the first and third cases, a medical report was required to certify compliance with the conditions laid down by law. In the three cases, abortion was not punishable if undertaken by a doctor, or under their supervision, in a medical establishment approved for abortions, whether public or private, with the express

consent of the woman.

In practice, about 98% of all abortions reported between 1986 and 2010 were filed under "risk to the health of the mother". Many of those cases argued risks to the mother's mental health, as confirmed by a psychologist, and this was easy to argue for unwanted pregnancies.

Figure 1 shows the annual number of registered abortions, as reported by the Spanish Ministry of Health. By 1992, one out of every 10 pregnancies was terminated legally (45,000 annual registered abortions, for under 400,000 live births). By 2010, it was 1 out of every 5 pregnancies. In 2010, a new law was passed which decriminalized the practice of abortion during the first 14 weeks of the pregnancy, without the need for any special circumstance to concur.

3. Short-term effects of access to abortion

3.1. Fertility and marriage effects

Empirical strategy

We first study the effects of abortion legalization on the reproductive outcomes of women. The abortion law was implemented in August 1985. Abortions taking place in and after August 1985 would have led to fewer births a few months later.[3] To make sure that we are able to capture all abortions occurring after the law (even those at unusually late stages of the pregnancy), we analyze the time series of births over time, and we

[3] The abortion data show that, in every year since 1992, more than 95% of all registered abortions take place before week 17 of the pregnancy. The birth-certificate data for 1986 show that about 95% of all births take place after week 35 of the pregnancy. The first registered legal abortions took place on August 9, 1985. An abortion that took place on August 9, 1985 at weeks 7-16 of pregnancy would have led to a birth on weeks 36-42 of the pregnancy, i.e. the birth would have taken place between late December, 1985, and early April, 1986. Thus, our first "post" month in the birth data is December 1985. The most common scenario for an August 9, 1985 abortion would be: the abortion taking place on weeks 7-8, which would have led to a birth on weeks 39-40, i.e. in March of 1986.

look for a break around December 1985, controlling for seasonality.

To this end, we use micro-data on all births taking place monthly at the national level, and start by analyzing the change in the time series. We estimate the following equation:

$$Births_\tau = \alpha + \beta_1 Post_\tau + \beta_2 \tau + \beta_3 \tau^2 + \lambda_m + \epsilon_\tau \qquad (1)$$

where *Births* is the number of births (or the natural log, or the birth rate) in month τ, and $Post_\tau$ is a binary indicator taking the value 1 in all months starting in December 1985, and 0 otherwise. Month of birth τ is normalized to 0 for December 1985 and thus takes values -1 for November 1985, 1 for January 1986, etc. We also include a quadratic trend in month of birth, and a set of calendar month dummies (λ_m). A negative β_1 would indicate a (persistent) fall in the number of live births with respect to the pre-existing trend, coinciding with the timing of the legalization of divorce.

In our main specification, we include 36 months pre- and post- the implementation of the 1985 abortion law, so that our sample contains 72 months, starting in December 1982 and ending in December 1988. We also use alternative windows, including either 24 or 30 months pre- and post-reform.

A drop in (early) fertility may have led to a reduction in the number of (early) marriages. We thus estimate equation (1) using the monthly number of marriages as a dependent variable. Note that in this case, the post-reform period starts immediately after the law was implemented, in August 1985.

We then exploit the regional variation in the intensity of exposure to the reform. The impact of abortion legalization was unequal across the Spanish territory, mainly due to the different availability of abortion clinics. By 1989, all clinics that practiced at least one (legal) abortion in a year had the legal obligation to report it to the Ministry of Health, who, in turn, publishes the list of clinics annually. Using the first annual report

available, we construct an indicator of the number of clinics per 100,000 inhabitants for each of the 50 provinces in Spain.[4]

Figure 2 shows the regional variation in the supply of abortion clinics across Spanish provinces in 1989. There are large geographical differences: in 10 provinces, there were 0.3-0.6 clinics per 100,000 inhabitants, while 24 out of 50 provinces had no clinics reporting abortions in 1989. We also use three alternative measures of access to abortion services: an indicator of the province having at least one clinic practicing abortions in 1989, the absolute number of clinics, and the distance to the nearest province with at least one clinic.[5]

We then estimate a (quasi) difference-in-differences specification that interacts the post-reform variable with our measure of the supply of abortion services:

$$Y_{p\tau} = \alpha + \beta Post_{\tau} * Supply_{p} + \mu_{p} + \delta_{t} + \lambda_{m} + \epsilon_{p\tau} \quad (2)$$

where *Y* is the number of either births or marriages in province *p* and month τ (where time is again normalized to zero in December 1985), *Supply* is our measure of access to abortion services (clinics per 100,000 inhabitants), μ, δ, and λ denote province, year, and calendar month fixed-effects, and $\epsilon_{p\tau}$ is a province- time varying error term. We estimate equation (2) using data from 50 provinces, for the same period of 72 months (36 before and 36 after abortion legalization).

National-level results

Figure 3 shows the annual number of ***births*** in Spain for three age groups (younger than 18, between 18 and 25, and older than 25), between 1980 and 1990. While the number

[4] The Ministry of Health started to collect this information in 1988. However, the information for that year is incomplete (for example, there is no information for the whole region of Catalonia). Therefore, we use the first year of complete information, 1989. We leave out of the analysis the Autonomous cities, Ceuta and Melilla.

[5] To calculate the distance, we use the geographical coordinates (latitude and longitude) of each province's center and the Stata command ***geonear*** to find the nearest province with at least one clinic.

of births displays a decreasing trend (especially for the two younger groups), we observe a large drop in the number of births immediately after the reform among women younger than 18, suggesting that the reform mainly affected teen fertility.

We estimate equation (1) using birth-certificate data at the monthly level. We use three measures of fertility: the monthly number of births, the number of births in logs, and the rate of births per 1,000 women. Table 1 displays our coefficient $ß_1$, which captures the estimated effect of the 1985 change in the abortion law on our alternative measures of fertility, during the first three years after the reform. We find (first row) that the legalization of abortion led to an immediate decrease in the monthly number of births, of about 2 log-points, or 0.07 monthly births per 1,000 women.[6]

We then split births by quartiles of age of the mother (second panel of Table 1), and find a significant reduction in the number of births for all ages, except for 27- to 30-year-old women. Births decreased by almost 3 log-points for mothers aged 23 or younger, while the reduction was 3.4 log-points for mothers in the age bracket 24-26, and 2.5 log-points for women 31 and older.[7]

Appendix Table A2 shows the results for each single age separately. The impact of the policy is larger and more significant for women younger than 21, as shown in Figure 4. We conclude that the legalization of abortion reduced fertility, especially among women who were under age 21 at the time of the reform (that is, those who were born after 1964).

The drop in early fertility may have led to a reduction in the number of early ***marriages***. We use marriage-certificate data, and compare the total number of marriages

[6] Before the legalization, the average number of births per month was 39,400, while the monthly birth rate per 1,000 women was 4.9.

[7] Appendix Table A1 shows that the results in Table 1 are robust to alternative windows (such as 24 or 30 months around the reform), especially the drop in births among the younger women.

before and after the reform. Figure 5 shows an index (1985=100) for the annual number of marriages of women between 17 and 22 by age, 5 years before and after the reform. Similar to the decreasing trend in fertility, the annual number of marriages was decreasing over time, but visual inspection does not suggest any change in this trend after the abortion legalization. If anything, there may have been a decrease in the number of marriages among 17-year-olds.

We estimate equation (1) over the number of marriages (or the natural log, or the number of marriages per 1,000 women) in month *t*. The results are displayed in Table A5. Essentially all of the coefficients are positive and statistically insignificant. We find no evidence of a significant decline in the number of marriages following abortion legalization.[8]

Exploiting regional variation in abortion services

Figure 6 shows an index (1985:100) of the annual number of births, splitting the population into two groups: provinces without abortion clinics in 1989, and provinces with at least one clinic that practiced abortions in 1989. Panel A displays the results for all ages. While fertility shows the same decreasing trend in both groups of provinces before the reform, the decrease after the reform is more pronounced in provinces with a higher supply of abortion services. This pattern is also observed when we look at women younger than 21 (Panel B).

We then estimate equation (2) at the province-month level, interacting the post dummy with an indicator for the potential supply of abortion services. In our main specification, we use the number of clinics per 100,000 inhabitants in the province. Results are displayed in Table 2. We report the coefficient on the interaction between

[8] Table A6 shows the results separately by age of the mother. We find a decline in marriages among women aged 20 and younger, but none of the coefficients are statistically significant.

the post dummy and the number of clinics per 100,000 inhabitants in the province. The first row shows that regions with a higher supply of abortion clinics experienced a more pronounced drop in short-term fertility. The average province with positive supply of abortion services had 0.24 clinics per 100,000 inhabitants in 1989, so that we estimate that the legalization of abortion led to a 2.4% decline in birth-rates in the province during the first three years.[9] When we split births by age of the mother (second panel of Table 2), we find that the results for birth rates are driven by younger mothers. The equivalent magnitude is about 6%.[10]

In Table 3 we present some evidence on fertility effects by socio-economic status. Spanish birth records for the 1980's do not provide information on the education level of the mother, but we do have information on their occupation. We classify occupations into high- and low-skilled.[11] The results suggest that the legalization of abortion affected the (short-term) fertility of the most disadvantaged group of women.

In Table 4 we present the results of estimating equation (2) for the number of marriages. We find evidence of a significant drop in the number of marriages among women aged 21 and younger, in provinces with a larger supply of abortion services. This is consistent with the strong drop in fertility among younger women.

Robustness checks

Treatment intensity

Appendix Table A3 shows that our main fertility results remain when we use alternative measures of treatment intensity. In Panel A we divide the sample into two groups

[9] (-0.4467*0.24)/4.6, where 4.6 was the average birth-rate.
[10] (-0.417*0.24)/1.62.
[11] High-skilled occupations include professionals and technicians; managers and directors; and administrative or similar jobs. We combine information on both the mother and the father, and divide the sample into three groups: both parents in high-skilled occupations, only one in high-skilled occupations, and no parent in high-skilled occupation.

according to whether there was at least one clinic that practiced abortions in the province in 1989. Regions with at least one clinic experienced a drop in the monthly number of births of close to 5 log-points, while there is no significant effect on short-term fertility in provinces without clinics. In Panel B, we interact the post-reform indicator variable with the distance to the nearest province with at least one clinic that practiced abortions in 1989. We find that the larger the distance, the lower the drop in fertility. Finally, in Panel C we use the absolute number of clinics, and find again that the drop is higher in provinces with a larger number of clinics practicing abortions, although the estimates are less precise. Our preferred specification is the one interacting the post reform variable with the number of clinics per 100,000 inhabitants, as it exploits variation across provinces while taking into account the size of each province.

In sum, we find that the drop in the number of births as a result of the abortion reform was stronger in provinces with a higher treatment intensity (as measured by the density of abortion clinics), as well as for young women and those in low-skilled couples.

Controlling for demand factors

We interpret the number of abortion clinics per 100,000 inhabitants as a measure of the supply of abortion services. However, the supply of clinics could be driven by demand factors, such that higher underlying demand for abortion services could be driving clinic availability, and thus the supply of clinics would be endogenous. In order to test for this possibility, we gathered information on some of the most relevant demand factors. In order to take into account cultural and religious factors (since the Catholic church does not allow abortion), we collected information on religiosity by region from the 1985

Fertility Survey.[12] As a direct measure of underlying demand, we calculate the fraction of teenage births before abortion legalization in each province.

Appendix figures A1-A3 show the regional distribution of the percentage of births to women aged 18 or younger in 1984, the percentage of births to unmarried women aged 21 or younger in 1984, and the percentage of adults who declare being practicing Catholics in 1984, by province. Visually, there is not much apparent overlap across these different indicators. We then re-run our fertility specifications (as in equation (2)), additionally controlling for the birth rates to young women in 1984 (and its interaction with the post indicator) and the percentage of practicing Catholics in 1985 (and its interaction with the post indicator). Table A4 shows that our baseline results remain strongly statistically significant, even after controlling for these demand-driven (potentially competing) explanatory factors.[13] We thus conclude that our results are driven by the supply of abortion services.

Therefore, we find that the legalization of abortion led to a fall in birth rates, which was stronger among younger women, and a drop in marriages among younger women living in provinces with higher density of abortion clinics.

[12] The 1985 Fertility Survey (FS) is carried out by the Spanish National Statistical Institute to women 15 to 49. The sample included 8,782 observations. The survey asked women about their place of residence and their religiosity. Regarding the second, the answers are grouped into: non-believer, non-practicing Catholic, practicing Catholic, another religion, and do not know/do not answer. We calculate the fraction of women who were practicing Catholic by province in 1985. Answers are missing for 7 provinces (Avila, Guadalajara, Huelva, Lleida, Segovia, Soria and Teruel) due to lack of enough sample size. To estimate the religiosity of these missing provinces, we follow the multiple imputation methodology suggested by Rubin (1987), and regress the fraction of practicing Catholic at the province-level on other indicators (fraction of left-wing voters in 1980, birth rates of young women in 1984).

[13] Our baseline results also remain statistically significant when controlling for the province-level proportion of women who reported that they have taken and/or were currently taking the pill (1985 Fertility Survey).

3.2. Labor market and education effects

If women who were very young when abortion was legalized were able to postpone fertility and avoid teen births, this could have had short-term effects on women's schooling and/or labor supply decisions. We analyze women's education and employment outcomes in the years right following the implementation of the reform (years 1987-1994), using micro data from the Labor Force Survey. We define treatment based on the age of each woman at the time of abortion legalization.

We focus on women born between 1958 and 1971 (inclusive). We define as "treated" those who were born in 1965 or later, so that they were 21 or younger at the time of the reform. We estimate the following quasi-diff-in-diffs specification at the individual level:

$$Y_{icpt} = \alpha + \beta Treated_c * Supply_p + \mu_p + \delta_t + \gamma_c + \epsilon_{icpt}, \quad (3)$$

where Y_{icpt} is the outcome of interest for individual *i* who belongs to cohort (year of birth) *c* and lives in province *p* in year *t*. The variable *Treated* takes value 1 for all treated cohorts (1965 to 1971), and this variable is interacted with the supply of abortion services (abortion clinics per 100,000 inhabitants). In an alternative specification, we replace the binary treatment variable by a linear trend in year of birth. We also include province, year, and cohort fixed effects. Education and labor market outcomes are measured in 1987-94, i.e. during the 9 years immediately following abortion legalization. As before, standard errors are clustered at the province level (50 provinces). As outcome variables, we use three dummy variables indicating labor force participation, employment, and full-time education.

The Spanish Labor Force Survey (EPA) is a rotating quarterly survey carried out by the Spanish National Statistical Institute. Sample size is about 64,000 households per quarter, including approximately 150,000 adult individuals. We use the second

interview of each year in order to minimize repeated observations of the same individual, and restrict the sample to women aged 16 to 24, in order to capture the short-term effects on educational enrolment. Age at the time of the interview is indirectly controlled for, since it equals the year of the survey minus the year of birth, which are both included in the regression.

Table 5 reports the results of these regressions. Women who were 21 or less when abortion was legalized (Panel A) in regions with more supply of abortion services, were 7 percentage points more likely to be in full-time education, compared to the control group. There is a reduction of about the same magnitude in the fraction who are working. Panel B includes cohort as a continuous variable, and the results show again that women who were younger in 1985 were more likely to remain enrolled in education in the following years.[14] Access to abortion seems to have allowed young women to stay in full-time education longer.

4. Long-term effects of access to abortion

4.1. Completed fertility

We next evaluate whether the short-term fertility effects persisted, leading to the affected women having fewer children throughout their lifetime. We study whether the cohorts of women who were able to avoid unwanted births early in life simply postponed those births, versus their completed fertility falling. In order to do so, we construct the accumulated number of children born per woman, by year of birth and province, at different ages (18, 21, 34, and 44), combining birth-certificate and population data. We estimate the following quasi-diff-in-diffs specification:

$$Y_{cpa} = \alpha + \beta Treated_a * Supply_p + \mu_p + \gamma_c + \epsilon_{cpa} \quad (4)$$

[14] The results are robust to broader age ranges.

where Y_{cpa} is the accumulated number of births per woman for cohort *c* in province *p* at age *a*. The variable *Treated* takes value 1 for all treated cohorts (women born between 1965 and 1971), and it is interacted with the supply of abortion services (abortion clinics per 100,000 inhabitants) at the time of the reform. We control for province and cohort fixed-effects. In alternative specifications, we include cohort as a continuous treatment variable.

To calculate the accumulated number of children born per woman by cohort, we pool the total number of births (from birth certificates) from 1975 to 2015, and calculate the cumulative number of births by cohort and province. We focus on the cohorts born between 1958 and 1971. The cumulative number of births by cohort and province is then divided by the size of the cohort, to get the average number of children born per woman in a cohort and province, at the different ages.

We approximate the size of each cohort of women by province of residence with the number of women living in each province in 1981, by age, from the (pre-reform) 1981 Population and Housing Census. The 1981 Census does not provide information about the year of birth of each woman, only their age, so that we assign each woman to a cohort according to their age at the time when the Census was carried out. This approach ignores migration across provinces after 1981,[15] so we alternatively approximate the size of each cohort by province with the (post-reform) 1991 Population and Housing Census.

Table 6 reports the results when using the 1981 Census to approximate the size of each cohort. Columns 1 to 4 show the results from estimating equation (4) for the average number of children born per woman, by cohort and province, by ages 18, 21,

[15] According to the 2011 Population and Housing Census, between 21 and 27 percent of women born between 1958 and 1971 were living in a province different from where they were born. These figures are similar 10 years before, suggesting that they tended to migrate at earlier ages.

34, and 44, respectively. The specification in the first panel groups the cohorts more affected by the abortion legalization (those born between 1965 and 1971), and compares them with the less affected cohort group (women born between 1958 and 1964), in different provinces according to the number of clinics that practiced abortions in 1989 (per 100,000 inhabitants).

We find that the most affected cohorts tend to have fewer children at earlier ages, and that the effect is larger the greater the supply of abortion services in the province. More specifically, the first panel shows than women who were younger than 21 in 1985 and lived in provinces with abortion clinics had significantly fewer children by ages 18, 24, and 34, relative to older cohorts and women living in provinces with no abortion clinics. However, the effect is statistically insignificant and small by age 44.

In terms of magnitudes, the average province with positive supply of abortion services had 0.24 clinics per 100,000 inhabitants in 1989. Thus, our estimates suggest that the average clinic availability led the treated cohorts to reduce their teen birth rates by close to 20% ((-0.463x0.24)/0.0563), while the effect was closer to 15% by age 24. By age 34, the effect on accumulated fertility amounted to about 3% of average birth rates, while by age 44 it was down to below 2%.

In the second panel we estimate an alternative specification, which interacts the number of clinics per 100,000 inhabitants with a continuous cohort variable. Again, we find a significant effect of the legalization of abortion on fertility by age 18, 24, and 34, but the coefficient turns insignificant at 44, suggesting a small (if any) effect on completed fertility.

We find very similar results when using the 1991 Census instead of the 1981 Census to estimate the size of each cohort by province: a drop in early fertility, but no significant effects on completed fertility measured at age 44. In summary, our findings

suggest that the effect of the abortion legalization on early fertility did not translate into a significant decline in completed fertility, for the most affected cohorts of women.

4.2. Labor market outcomes

We next investigate the long-term effects of the abortion reform on educational attainment, family formation, and labor market outcomes. We use data from the Spanish Labor Force Survey for years 2000 to 2007 (i.e. between 15 and 22 years after the reform). As before, we use the second interview of each year, and select women born between 1958 and 1971 (inclusive), so that they were 14-27 at the time of the reform. These cohorts are between 42-49 (the oldest cohort) and 29-36 (the youngest one) at the time of the interviews. Again, we define as treated women who were born in 1965 or later, so that they were 21 or younger at the time of the reform, and we observe their outcomes at the ages of 35-42. We deliberately exclude the years of the great recession from the sample (2008 onwards). We estimate again equation 3, now focusing on the long-term effects of the reform on educational achievement, labor market outcomes, marriage, and divorce.

Table 8 shows the main results. Panel A displays the results for educational attainment. We find that women who were more exposed to legal abortion were 5 percentage points more likely to graduate from high school. We do not find significant effects on college attendance. Thus, the evidence suggests that legalizing abortion had long-term effects on educational attainment for young women.

We also estimate effects on family formation and dissolution (Panel B). We find that exposed women are 5 percentage points less likely to have ever married. They are slightly less likely to be married at the time of the survey, but this effect is not statistically significant. They are, however, significantly less likely to be separated or divorced. This suggests that exposure to legal abortion, which we showed led to fewer

early marriages, increased the quality of matches, resulting in lower rates of marital dissolution in the long term.

Finally, Panel C shows effects on labor market outcomes. Women more affected by abortion legalization while young are about two percentage points more likely to be employed in the 2000's, but the coefficients are not statistically different from zero. We also find that their annual earnings are about 2.5 log points higher, but again precision is low and we cannot reject null effects.[16]

We conclude that the legalization of abortion increased the educational attainment of women with better access to abortion services, but this improvement in educational levels did not translate into (significantly) better labor market outcomes in the long-run. We do find a lower divorce rate among the treated cohorts of women, suggesting that later marriage may have led to better matches.

4.3 Life satisfaction

We use data from the Spanish sample of the 2000 European Community Household Panel to assess the long-term effects of abortion legalization on subjective well-being. The survey asks about the degree of satisfaction with regards to work, economic situation, housing conditions, and time devoted to leisure. Answers range from 1 to 6, where 1 means "very dissatisfied" and 6 "fully satisfied". We estimate equation (3) using as a dependent variable the degree of satisfaction in each dimension as well as a synthetic index, which is the first component of a Principal Component Analysis based on the degree of satisfaction in the four dimensions.

In 2000 the youngest cohort in our sample (women born in 1971) is 29 years old, while the oldest one (1958 cohort) is 42, so that we are evaluating women's degree of

[16] Earnings data come from Social Security (*Muestra Continua de Vidas Laborales*). We use the 2009 sample and construct annual earnings at the individual level for 2000-07.

satisfaction when they are mostly in their 30's. One important limitation of these data is that regional information is only available at a more aggregated level, so we can exploit the variation across only 17 regions (instead of 50 provinces). We restrict our sample to native women who live in the same region where they were born, or who migrated to that region before 1985. Sample size is almost 3,940 observations.

Table 8 displays the results. We find no significant effect of exposure to legal abortion before age 21 on satisfaction with the job or the economic situation. This is consistent with our finding of insignificant effects on labor market outcomes. We do find that women more affected by the abortion legalization report higher satisfaction with their housing conditions and with the time devoted to leisure. Our synthetic index (column 5) also suggests that women affected by the reform enjoy greater subjective well-being overall.

5. Conclusions

We analyze the short- and long-term effect on women's lives of the legalization of abortion in Spain in 1985. We follow a difference-in-differences strategy, where we exploit the fact that younger cohorts of women were exposed to legal abortion at an earlier age, as well as the geographic variation in the supply of abortion services in the early years after legalization.

We find that women who had access to legal abortion before age 21 were less likely to have children at an early age, while their completed fertility was unaffected. We also find that they were less likely to marry early, and in the long term they were less likely to get divorced. We find a positive effect on high school graduation rates, and no effect on college attendance. We do not find significant long-term effects on labor supply or earnings, but provide suggestive evidence of a positive impact on overall life satisfaction 15 years after the reform.

Overall, our results suggest that legalizing abortion in Spain allowed young women to delay fertility and marriage and remain in full-time education, resulting in higher life satisfaction 15 years down the line. Our findings also suggest that there were not costs in terms of fertility in the long-run. In addition, the fact that women, especially those from a disadvantaged background, were able to control the timing of their first birth could imply positive effects on the cohort of children born after the abortion legalization. To what extent this may have translated into better outcomes for children in the long-run, is a topic to be addressed in future research.

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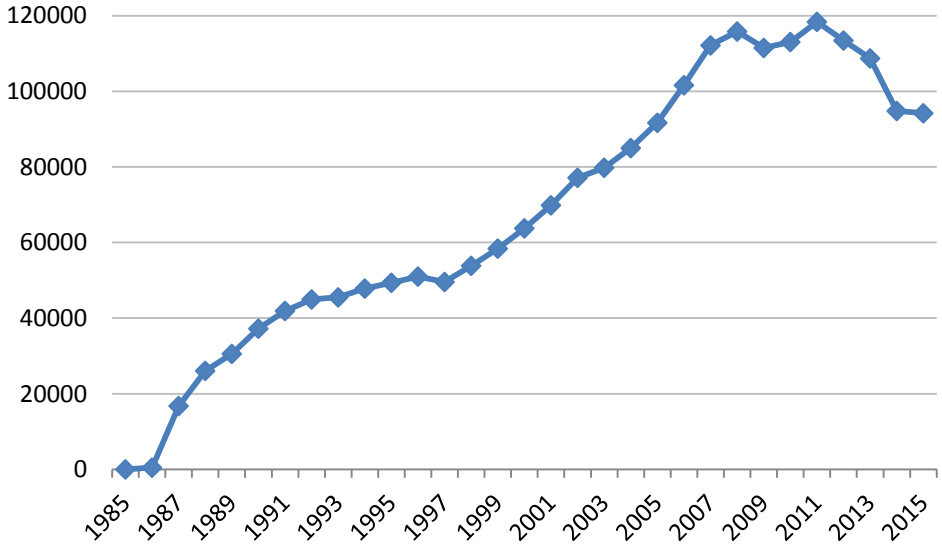
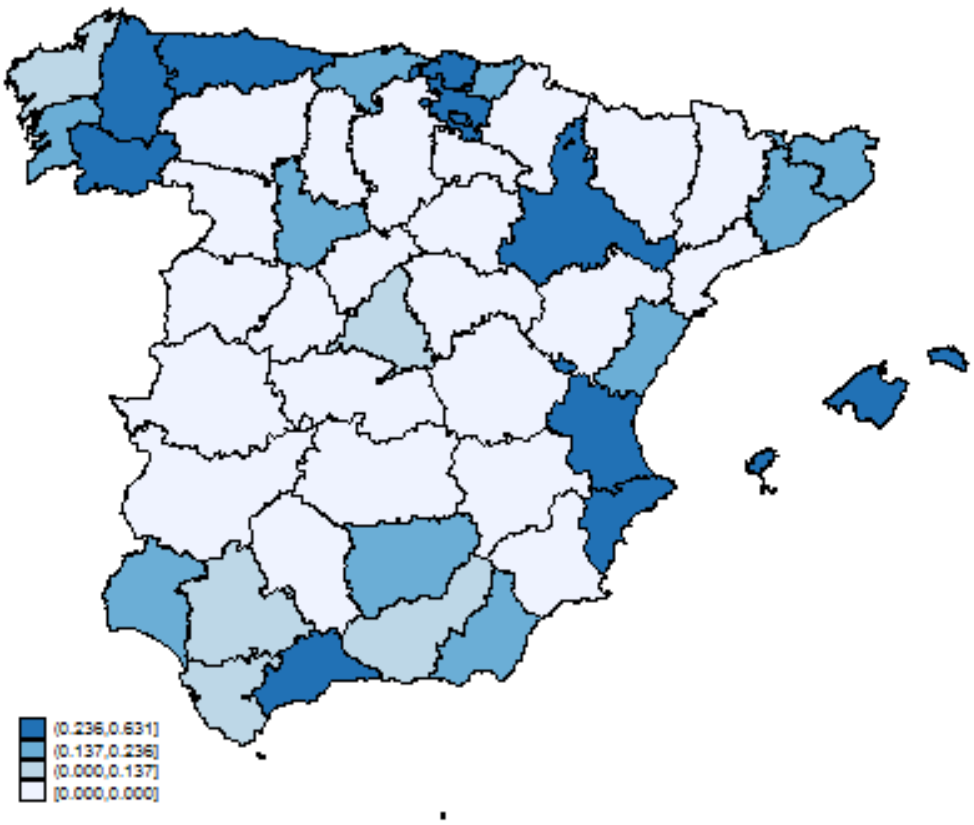
Tables and Figures

Figure 1. Annual number of registered abortions, Spain 1985-2015



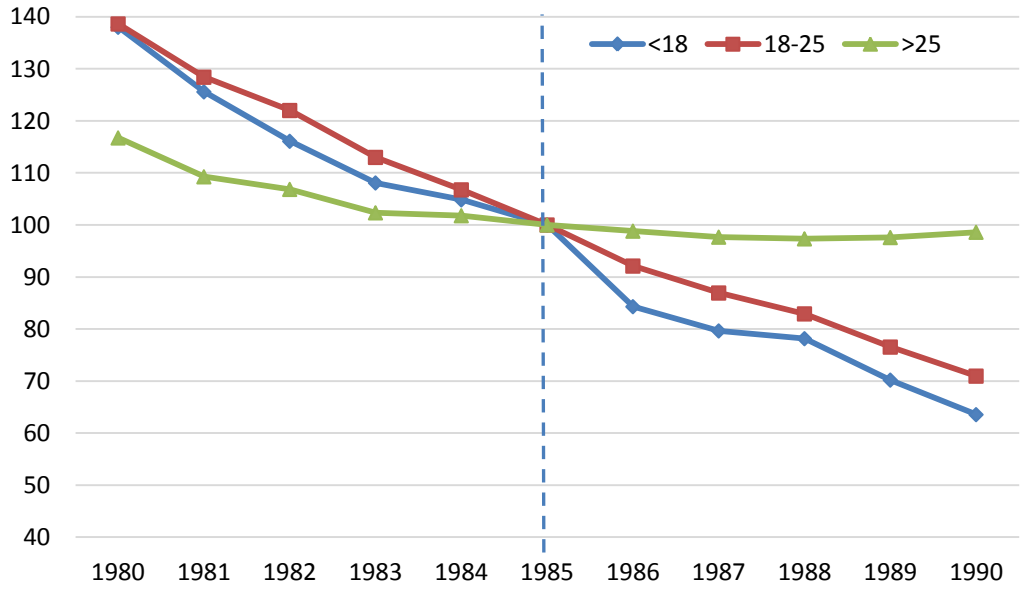
Source: Spanish National Statistical Institute from 1988 onwards.

Figure 2. Number of clinics that practiced abortions in 1989 per 100,000 inhabitants, by province



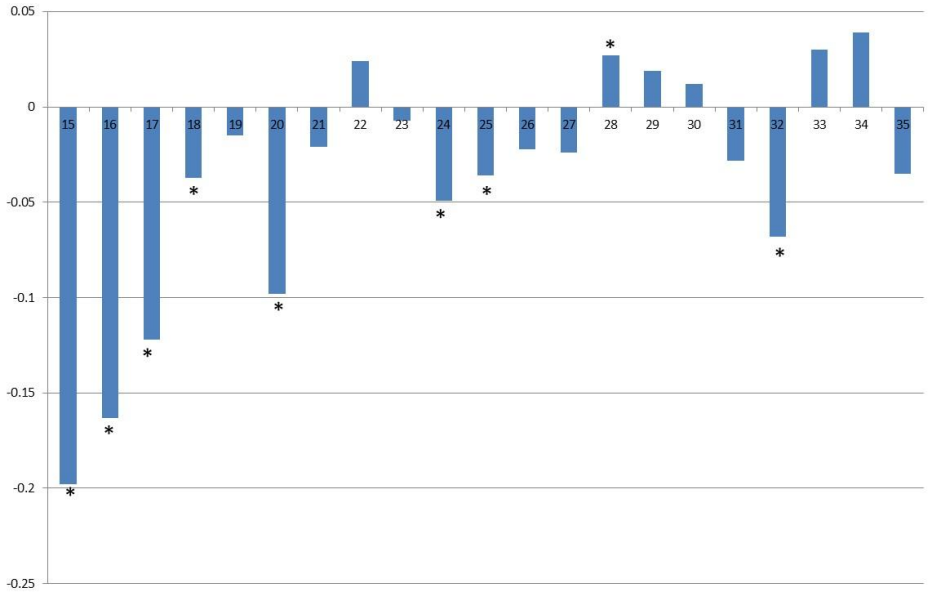
Notes: Authors' calculations based on data from the 1989 report of voluntary pregnancy interruptions from the Spanish Ministry of Health, Social Services and Equality and province-level population from the Spanish National Statistical Institute.

Figure 3. Annual number of births by age of the mother (1985: 100).



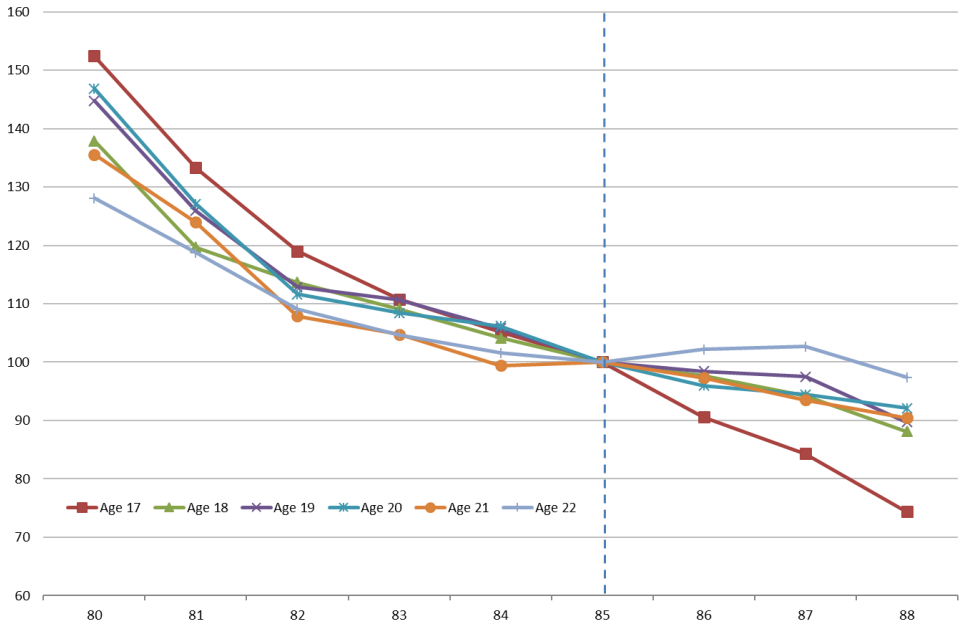
Source: Birth-certificate data, Spanish National Statistical Institute.

Figure 4. Effect of abortion legalization on births (in logs) by age of the mother



Note: Results from estimating equation 1 over the monthly number of births in logs. We plot the coefficient of the post-reform indicator variable (see Appendix Table A.2 for details).
* denote statistically significant effects.

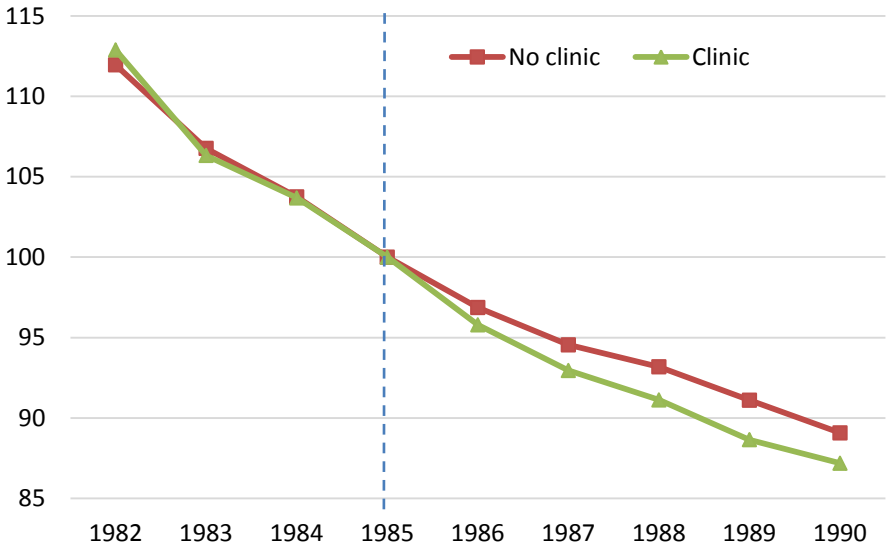
Figure 5. Annual number of marriages by age, Spain 1980-90 (1985:100)



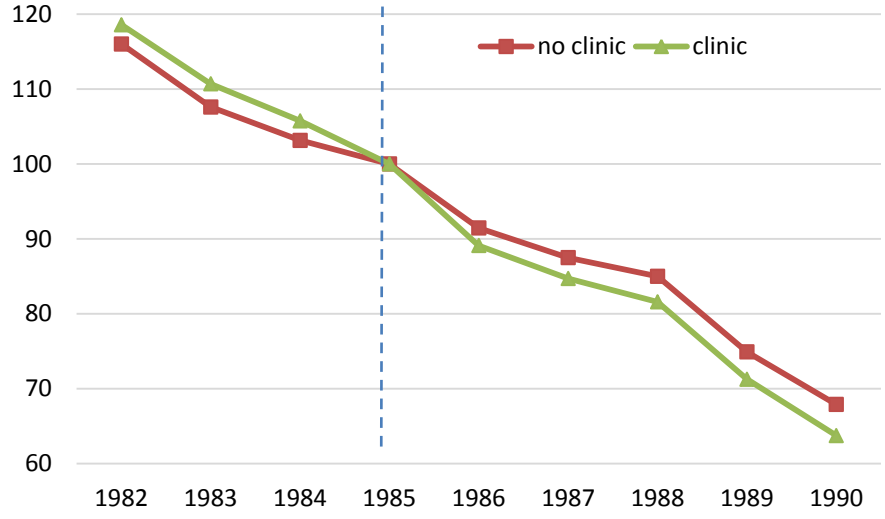
Source: Marriage-certificate data, Spanish National Statistical Institute.

Figure 6. The effect of the supply of clinics in the number of births.

Panel A. All ages, province with vs. without clinics in 1989



Panel B. Younger than 21, provinces with vs. without clinics in 1989



Source: Birth-certificate data, Spanish National Statistical Institute and data of clinics that practiced abortions in 1989 from the Spanish Ministry of Health.

Table 1. Short-term fertility effects, overall and by age group

	Births		*Births in logs*		*Births per 1,000 women*	
	(1)	(2)	(3)	(4)	(5)	(6)
All	-706.257*	-706.257*	-0.019*	-0.019**	-0.074	-0.074*
	(382.231)	(360.428)	(0.010)	(0.010)	(0.049)	(0.044)
By quartiles of mother's age:						
Q1: 23 and younger	-247.111**	-247.111***	-0.029***	-0.029***	-0.091**	-0.091***
	(106.270)	(88.707)	(0.010)	(0.009)	(0.038)	(0.031)
Q2: 24-26 y.o.	-288.972***	-288.972***	-0.034***	-0.034***	-0.205*	-0.205*
	(100.930)	(101.526)	(0.012)	(0.012)	(0.114)	(0.112)
Q3: 27-30 y.o.	72.847	72.847	0.007	0.007	-0.012	-0.012
	(111.004)	(106.870)	(0.011)	(0.011)	(0.102)	(0.095)
Q4: 31 and older	-243.021*	-243.021**	-0.025*	-0.025**	-0.052	-0.052
	(128.438)	(118.158)	(0.013)	(0.012)	(0.040)	(0.036)
N (number of months)	72	72	72	72	72	72
Linear trend in months	Y	Y	Y	Y	Y	Y
Quadratic trend in months	N	Y	N	Y	N	Y
Calendar month dummies	Y	Y	Y	Y	Y	Y

Notes: Results from estimating equation (1) using monthly births records. The table displays the coefficient of the variable *Post*, which takes the value 1 from December 1985 onwards and 0 otherwise. We include 36 months pre- and post- December 1985, so that our sample contains 72 months starting in December 1982 and finishing in December 1988. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 2. Short-term fertility effects by region according to clinic availability, overall and by age group

	Births	*Births in logs*	*Births per 1,000 women*
	(1)	(2)	(3)
Post × Clinics per 100,000 inhab	-211.21***	-0.0968**	-0.4467***
	(51.34)	(0.0387)	(0.1635)
By mother's age			
21 and younger			
Post × Clinics per 100,000 inhab.	-55.40***	-0.1231	-0.4170***
	(14.38)	(0.0755)	(0.1261)
Older than 21			
Post × Clinics per 100,000 inhab.	-155.81***	-0.0897**	0.0031
	(39.09)	(0.0392)	(0.2170)
N (months x provinces)	3,600	3,600	3,600
Calendar month dummies	Y	Y	Y
Year fixed-effects	Y	Y	Y
Province fixed-effects	Y	Y	Y

Notes: Results from estimating equation (2) using births records by month and province (36 months before and after the reform). The variable *Post* takes the value 1 from Dec. 1985 onwards and 0 otherwise. The variable *Clinics per 100,000 inhabitants* is based on the number of clinics that reported having practiced at least one abortion in 1989, by province (source: 1989 report of voluntary pregnancy interruptions, Ministry of Health, Social Services and Equality). Standard errors clustered at province level (50 clusters). *** p<0.01, ** p<0.05, * p<0.1.

Table 3. Short-term fertility effects by region and mother/father occupation

	Births (1)	*Births in logs* (2)	*Births per 1000 women* (3)
Both in high-skilled occupations			
Post × Clinics per 100,000 inhab.	11.638*	0.2040	0.0292
	(6.526)	(0.1357)	(0.0214)
One in high-skilled occupation			
Post × Clinics per 100,000 inhab.	-13.604	-0.0677	-0.0481
	(10.306)	(0.1129)	(0.0541)
No parent in high-skilled occupations			
Post × Clinics per 100,000 inhab.	-210.628***	-0.1177**	-0.4228**
	(57.781)	(0.0452)	(0.1814)
N (months x provinces)	3,600	3,600	3,600
Calendar month dummies	Y	Y	Y
Year fixed-effects	Y	Y	Y
Province fixed-effects	Y	Y	Y

Notes: Results from estimating equation (2) using births records by month and province. The variable *Post* takes the value 1 from Dec 1985 onwards and 0 otherwise. The variable Clinics per 100,000 inhabitants is based on the number of clinics that reported having practiced at least one abortion in 1989, by province (source: 1989 report of voluntary pregnancy interruptions, Ministry of Health, Social Services and Equality). High-skilled occupations are Professionals and Technicians; Managers and Directors; Administrative and similar staff. Standard errors clustered at province level (50 clusters). *** p<0.01, ** p<0.05, * p<0.1

Table 4: Short term effect on the number of marriages by region according to clinic availability, overall and by age group

	Marriages	*Marriages in logs*	*Marriages per 1000 woman*
	(1)	(2)	(3)
Post × Clinics per 100.000 inhab	-16.6083	-0.1444	-0.2891
	(54.2535)	(0.1842)	(0.2317)
By mother's age			
21 and younger			
Post × Clinics per 100.000 inhab	-64.1683***	-0.1670	-0.3923*
	(22.4032)	(0.2029)	(0.2195)
Older 21			
Post × Clinics per 100.000 inhab	47.5601	-0.0967	-0.1306
	(48.3201)	(0.1899)	(0.2652)
N (months x provinces)	3600	3600	3600
Calendar month dummies	Y	Y	Y
Year fixed-effects	Y	Y	Y
Province fixed-effects	Y	Y	Y

Notes: Results from estimating equation (2) using marriage records by month and province. The variable *Post* takes the value 1 from August 1985 onwards and 0 otherwise. The variable Clinics per 100,000 inhabitants is based on the number of clinics that reported having practiced at least one abortion in 1989, by province (source: 1989 report of voluntary pregnancy interruptions, Ministry of Health, Social Services and Equality). Standard errors clustered at province level (50 clusters). *** p<0.01, ** p<0.05, * p<0.1.

Table 5. Short-term effect on school enrolment and labor force participation, by region according to clinic availability

	In education	*In the labor force*	*In employment*
	(1)	(2)	(3)
Treated × Clinics per 100,000 inhab.	0.0695*	-0.1065*	-0.0717*
	(0.0371)	(0.0602)	(0.0384)
Cohort × Clinics per 100,000 inhab.	0.0121**	-0.0197*	-0.0024
	(0.0057)	(0.0107)	(0.0072)
N	77,466	77,466	77.466
Cohort fixed-effects	Y	Y	Y
Year fixed-effects	Y	Y	Y
Province fixed-effects	Y	Y	Y

Note: Results from estimating equation (3) using LFS data (second quarter) from 1987 to 1994 (ages 16 to 24). The variable Clinics per 100,000 inhabitants is based on the number of clinics that reported having practiced at least one abortion in 1989, by province (source: 1989 report of voluntary pregnancy interruptions, Ministry of Health, Social Services and Equality). Treated cohorts are those born between 1965 and 1971 so that they are aged 21 or younger at the time of the reform. Standard errors clustered by province.

Table 6. Effects of abortion legalization on completed fertility

	Age 18	Age 21	Age 34	Age 44
Treated × Clinics per 100,000 inhab.	-0.0463***	-0.1249***	-0.1430**	-0.1068
	(0.0120)	(0.0336)	(0.0687)	(0.0814)
Cohort × Clinics per 100,000 inhab.	-0.0062***	-0.0174***	-0.0180*	-0.0130
	(0.0015)	(0.0045)	(0.0096)	(0.0116)
Mean dep. var.	0.056	0.206	1.268	1.519
Province fixed-effects	Y	Y	Y	Y
Cohort fixed-effects	Y	Y	Y	Y
N	700	700	700	700

Notes: Results from estimating equation (4) over the average number of births per woman to a cohort and province at 18 years old (Column 1), 21 years old (Column 2), and so on. The average number of births per woman in a cohort and province was calculated as the total number of births by cohort and province (based on birth records between 1975 and 2015) divided by the size of the cohort by province in 1981 (based on female population by age and province in 1981, source: 1981 Population and Housing Census). Sample: 1958-1971 cohorts. "Treated" cohorts are those born between 1965 and 1971, so that they are aged 21 or younger at the time of the reform. Robust standard errors clustered at province level (50 clusters) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 7. Long-term effects of abortion legalization on family formation, educational attainment, and labor market outcomes

Panel A. Educational attainment

	High school or more	High school	College
Treated × Clinics per 100,000 inhab.	0.0533**	0.0738***	-0.0205
	(0.0231)	(0.0215)	(0.0213)
Province fixed effects	Y	Y	Y
Cohort fixed effects	Y	Y	Y
Year fixed effects	Y	Y	Y
N	136,339	136,339	136,339

Panel B. Marriage and divorce

	Ever married	Married	Divorced or separated
Treated × Clinics per 100,000 inhab.	-0.0517**	-0.0265	-0.0193**
	(0.0243)	(0.0257)	(0.0091)
Province fixed effects	Y	Y	Y
Cohort fixed effects	Y	Y	Y
Year fixed effects	Y	Y	Y
N	136,339	136,339	136,339

Panel C. Labor market outcomes

	Active	Working	Unemployed	Log earnings
Treated × Clinics per 100,000 inhab.	0.0181	0.0233	-0.0052	0.0254
	(0.0187)	(0.0176)	(0.0132)	(0.0414)
Province fixed effects	Y	Y	Y	Y
Cohort fixed effects	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y
N	136,339	136,339	136,339	889,430

Notes: Results from estimating equation (3) using LFS data (second quarter) from 2000 to 2007. The wage equation is estimated using SILC longitudinal data from 2004 to 2015 (similar results are obtained with a restricted time span). The variable Clinics per 100,000 inhabitants is based on the number of clinics that reported having practiced at least one abortion in 1989, by province (source: 1989 report of voluntary pregnancy interruptions, Ministry of Health, Social Services and Equality). Treated cohorts are those born between 1965 and 1971 so that they are aged 21 or younger at the time of the reform. Standard errors clustered by province (50 clusters). All the equations have been estimated by least squares except the wage equation which has been estimated using random effects.

Table 8. Long-term effects of abortion legalization on life satisfaction

	Satisfaction with job	Satisfaction with economic status	Satisfaction with housing	Satisfaction with leisure time	PCA (first component)
Treated × Clinics per 100,000 inhab.	0.2680	-0.0413	0.1428**	0.2406***	0.2191*
	(0.1570)	(0.1312)	(0.0540)	(0.0590)	(0.1115)
Region fixed effects	Y	Y	Y	Y	Y
Cohort fixed effects	Y	Y	Y	Y	Y
Observations	3,939	3,935	3,935	3,937	3,934
R-squared	0.0248	0.0247	0.0345	0.0180	0.0350

Notes: Results from estimating equation (3) based on the 2000 wave of the ECHP. The dependent variables "Satisfaction with…" in columns 1 to 4 range from 1 to 6, where 1 means "Unsatisfied" and 6 "Fully satisfied". In column 5, the dependent variable is the first component of a Principal Component Analysis using the variables in columns 1 to 4. Sample: women who live in the same region where they born or migrated to that region before 1985, born in 1958-1971. Treated cohorts are those born between 1965 and 1971 (aged 21 or younger at the time of the reform). The regional disaggregation of these data is at *Comunidad Autónoma* level, so standard errors are clustered at that level (17 clusters). *** p<0.01, ** p<0.05, * p<0.1

Appendix

Table A1. Effect of abortion legalization on the number of births. Alternative windows

	Births		*Births in logs*		*Births per 100,000 women*	
	(1)	(2)	(3)	(4)	(5)	(6)
A. Window: 24 months						
All	-561.917	-561.917	-0.015	-0.015	-0.060	-0.060
	(483.168)	(471.093)	(0.013)	(0.013)	(0.060)	(0.058)
By quartiles of mother's age:						
Q1: 23 and younger	-243.292**	-243.292**	-0.027**	-0.027**	-0.088**	-0.088**
	(118.834)	(112.291)	(0.012)	(0.012)	(0.042)	(0.039)
Q2: 24-26 y.o.	-95.083	-95.083	-0.010	-0.010	-0.072	-0.072
	(131.141)	(134.186)	(0.016)	(0.016)	(0.147)	(0.148)
Q3: 27-30 y.o.	-16.667	-16.667	-0.001	-0.001	-0.019	-0.019
	(132.271)	(129.909)	(0.013)	(0.013)	(0.120)	(0.117)
Q4: 31 and older	-206.875	-206.875	-0.021	-0.021	-0.048	-0.048
	(166.955)	(158.965)	(0.017)	(0.016)	(0.051)	(0.048)
B. Window: 30 months						
All	-670.944	-670.944*	-0.018*	-0.018*	-0.070	-0.070
	(405.894)	(375.779)	(0.010)	(0.010)	(0.052)	(0.046)
By quartiles of mother's age:						
Q1: 23 and younger	-266.528**	-266.528***	-0.031***	-0.031***	-0.098**	-0.098***
	(111.309)	(89.401)	(0.010)	(0.009)	(0.039)	(0.031)
Q2: 24-26 y.o.	-242.111**	-242.111**	-0.029**	-0.029**	-0.175	-0.175
	(109.180)	(111.340)	(0.013)	(0.013)	(0.126)	(0.122)
Q3: 27-30 y.o.	19.583	19.583	0.002	0.002	-0.041	-0.041
	(115.179)	(109.314)	(0.012)	(0.011)	(0.109)	(0.100)
Q4: 31 and older	-181.889	-181.889	-0.019	-0.019	-0.034	-0.034
	(129.726)	(118.560)	(0.013)	(0.012)	(0.040)	(0.036)
Linear trend in months	Y	Y	Y	Y	Y	Y
Quadratic trend in		Y		Y		Y
Calendar month	Y	Y	Y	Y	Y	Y

Notes: Results from estimating equation 1 using monthly births records. The table displays the coefficient of the variable *Post*, which takes the value 1 from December 1985 onwards and 0 otherwise. In panel A, we include 24 months pre- and post- December 1985, so that our sample contains 48 months starting in December 1983 and finishing in December 1987. In panel B, we include 30 months pre- and pot-December 1985, so that our sample contains 60 months starting in June 1982 and finishing in June 1988. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A2. Effect of abortion legalization on the number of births, by mother's age.

	Births		*Births in logs*		*Births per 1000 women*	
	(1)	(2)	(3)	(4)	(5)	(6)
Younger 16	-15.090***	-15.090***	-0.198***	-0.198***	-0.049***	-0.049***
	(5.591)	(4.876)	(0.063)	(0.056)	(0.017)	(0.015)
16 y.o.	-31.465***	-31.465***	-0.163***	-0.163***	-0.104***	-0.104***
	(6.814)	(6.877)	(0.035)	(0.035)	(0.022)	(0.022)
17 y.o.	-50.604***	-50.604***	-0.122***	-0.122***	-0.145***	-0.145***
	(11.509)	(11.503)	(0.029)	(0.029)	(0.037)	(0.036)
18 y.o.	-23.368**	-23.368**	-0.037**	-0.037**	-0.059*	-0.059
	(11.303)	(11.649)	(0.017)	(0.017)	(0.035)	(0.035)
19 y.o.	-14.708	-14.708	-0.015	-0.015	-0.047	-0.047
	(14.794)	(14.922)	(0.014)	(0.015)	(0.047)	(0.046)
20 y.o.	-121.250***	-121.250***	-0.098***	-0.098***	-0.280***	-0.280***
	(22.970)	(22.200)	(0.017)	(0.017)	(0.083)	(0.070)
21 y.o.	-34.479	-34.479	-0.021	-0.021	-0.087	-0.087
	(25.654)	(25.702)	(0.017)	(0.017)	(0.087)	(0.080)
22 y.o.	48.083	48.083	0.024	0.024	-0.043	-0.043
	(34.674)	(31.211)	(0.018)	(0.017)	(0.121)	(0.100)
23 y.o.	-4.229	-4.229	-0.007	-0.007	-0.081	-0.081
	(46.244)	(31.325)	(0.018)	(0.014)	(0.132)	(0.104)
24 y.o.	-118.938***	-118.938***	-0.049***	-0.049***	-0.152	-0.152
	(41.967)	(37.923)	(0.016)	(0.015)	(0.133)	(0.122)
25 y.o.	-100.340***	-100.340***	-0.036***	-0.036***	-0.221	-0.221*
	(36.419)	(36.979)	(0.013)	(0.013)	(0.133)	(0.123)
26 y.o.	-69.694	-69.694	-0.022	-0.022	-0.282	-0.282
	(60.941)	(54.376)	(0.021)	(0.019)	(0.179)	(0.179)
27 y.o.	-67.375	-67.375*	-0.024	-0.024*	-0.157	-0.157
	(43.434)	(37.201)	(0.015)	(0.013)	(0.124)	(0.125)
28 y.o.	70.944**	70.944**	0.027**	0.027**	0.117	0.117
	(28.970)	(29.179)	(0.011)	(0.011)	(0.114)	(0.102)
29 y.o.	45.632	45.632	0.019	0.019	-0.029	-0.029
	(44.978)	(40.001)	(0.019)	(0.017)	(0.156)	(0.143)
30 y.o.	23.646	23.646	0.012	0.012	0.047	0.047
	(49.893)	(37.752)	(0.023)	(0.017)	(0.160)	(0.149)
31 y.o.	-52.361	-52.361	-0.028	-0.028	-0.111	-0.111
	(39.332)	(33.529)	(0.022)	(0.019)	(0.138)	(0.133)
32 y.o.	-103.118***	-103.118***	-0.068***	-0.068***	-0.251**	-0.251**
	(23.929)	(23.828)	(0.016)	(0.016)	(0.097)	(0.096)
33 y.o.	38.160	38.160	0.030	0.030	0.026	0.026
	(24.757)	(24.613)	(0.019)	(0.019)	(0.099)	(0.098)
34 y.o.	45.333	45.333*	0.039	0.039*	-0.033	-0.033
	(29.774)	(24.871)	(0.027)	(0.023)	(0.103)	(0.103)
35+ y.o.	-29.035	-29.035	-0.035	-0.035*	0.010	0.010
	(25.952)	(18.319)	(0.027)	(0.020)	(0.074)	(0.068)
N (number	72	72	72	72	72	72
Linear trend	Y	Y	Y	Y	Y	Y
Quadratic		Y		Y		Y
Calendar	Y	Y	Y	Y	Y	Y

Notes: Results from estimating equation 1 using monthly births records. The table displays the coefficient of the variable *Post*, which takes the value 1 from December 1985 onwards and 0 otherwise. We include 36 months pre- and post- December 1985, so that our sample contains 72 months starting in December 1982 and finishing in December 1988. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A3. Short-term fertility effects by region and clinic availability. Alternative measure of clinic availability (births in logs)

	All	21 and younger	Older than 21
A. Dividing the sample according to whether there was at least one clinic that practiced abortions in 1989 in province *p*			
Provinces with no clinics	0.0097	0.0127	0.0070
	(0.0174)	(0.0162)	(0.0162)
Provinces with at least one clinic	-0.0474***	-0.1020***	-0.0373**
	(0.0143)	(0.0318)	(0.0135)
B. Using distance to the nearest province with at least one clinic			
Post × Distance	0.0003***	0.0004*	0.0003***
	(0.0001)	(0.0002)	(0.0001)
C. Using the absolute number of clinics			
Post × N. of clinics	-0.0013	-0.0053*	-0.0008
	(0.0028)	(0.0031)	(0.0028)
N (months x provinces)	3,600	3,600	3,600
Calendar month dummies	Y	Y	Y
Year fixed-effects	Y	Y	Y
Province fixed-effects	Y	Y	Y

Notes: Results from estimating equation (2) using births records by month and province. The variable *Post* takes the value 1 from Dec 1985 onwards and 0 otherwise. In panel A, we divide the sample into two groups according to whether there was at least one clinic that practiced abortions in 1989 in province *p* or not. In panel B, the variable Distance is the distance (in km) to the nearest province with at least one clinic that practiced abortions in 1989. In panel C, the variable *Nclinics* is the absolute number of clinics that practiced abortions in 1989 in province *p*. Standard errors clustered at province level (50 clusters). *** p<0.01, ** p<0.05, * p<0.1.

Table A4. Short-term fertility effects by region and clinic availability, controlling for demand factors

	Births	*Births in logs*	*Births per 1000 women*
A. Baseline			
Post ×Clinics per 100,000 inhab	-212.594***	-0.0947**	-0.4416**
	(51.990)	(0.0399)	(0.1680)
B. Controling for birth rates among young women			
Post ×Clinics per 100,000 inhab.	-210.986***	-0.1081***	-0.3274*
	(57.438)	(0.0390)	(0.1679)
Post ×Births<18	-256.651	2.1295	-18.2416***
	(2,363.347)	(1.3769)	(5.7217)
Post ×Clinics per 100,000 inhab.	-191.533***	-0.1042***	-0.3363**
	(58.451)	(0.0383)	(0.1540)
Post ×Births<21,unmarried	-8,597.430*	3.8697	-42.9897***
	(5,033.482)	(3.4098)	(11.8921)
C. Controling for religiosity			
Post ×Clinics per 100,000 inhab.	-153.0491**	-0.1298***	-0.3457**
	(58.3529)	(0.0400)	(0.1705)
Post ×Fraction of Practicing Catholics	123.1668*	-0.0725*	0.1985
	(73.4592)	(0.0432)	(0.1818)
N (months ×provinces)	3,600	3,600	3,600
Calendar month dummies	Y	Y	Y
Year fixed-effects	Y	Y	Y
Province fixed-effects	Y	Y	Y

Notes: Results from estimating equation (2) using births records by month and province. The variable *Post* takes the value 1 from Dec 1985 onwards and 0 otherwise. Standard errors clustered at province level (50 clusters). *** p<0.01, ** p<0.05, * p<0.

Table A5: Short term effect on the number of marriages, overall and by age group

Dependent variable:	*Marriages*		*Marriages in logs*		*Marriages per 1000 women*	
	(1)	(2)	(3)	(4)	(5)	(6)
All	107.458	107.458	0.007	0.007	0.008	0.008
	[724.609]	[711.899]	[0.039]	[0.038]	[0.046]	[0.045]
By group of mother's ages:						
Q1: 23 and younger	50.097	50.097	0.001	0.001	0.014	0.014
	[389.770]	[385.236]	[0.040]	[0.039]	[0.122]	[0.121]
Q2: 24-26 y.o.	65.486	65.486	0.023	0.023	0.111	0.111
	[216.439]	[216.736]	[0.039]	[0.040]	[0.239]	[0.236]
Q3: 27-30 y.o.	32.049	32.049	0.011	0.011	-0.000	-0.000
	[249.371]	[246.525]	[0.040]	[0.040]	[0.218]	[0.217]
Q4: 31 and older	23.458	23.458	0.012	0.012	0.003	0.003
	[209.172]	[201.223]	[0.036]	[0.035]	[0.019]	[0.018]
N (number of months)	72	72	72	72	72	72
Linear trend in months	Y	Y	Y	Y	Y	Y
Quadratic trend in months		Y		Y		Y
Calendar month dummies	Y	Y	Y	Y	Y	Y

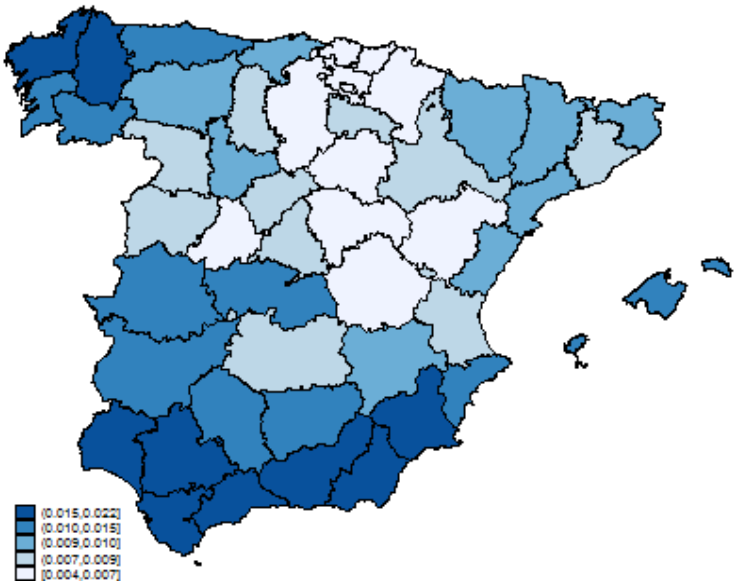
Notes: Results from estimating equation (1) using monthly marriage records. The table displays the coefficient of the variable *Post*, which takes the value 1 from August 1985 onwards and 0 otherwise. We include 36 months pre- and post- August 1985, so that our sample contains 72 months starting in August 1982 and finishing in August 1988. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A6. Effect of abortion legalization on the number of marriages, by mother's age

Dep. variable:	*Marriages*		*Marriages in logs*		*Marriages per 1000 women*	
	(1)	(2)	(3)	(4)	(5)	(6)
Younger 16	-8.403	-8.403	-0.146	-0.146	-0.014	-0.014
	[7.884]	[6.185]	[0.087]	[0.076]	[0.012]	[0.010]
16 y.o.	-9.097	-9.097	-0.051	-0.051	-0.030	-0.030
	[8.766]	[8.696]	[0.044]	[0.044]	[0.027]	[0.027]
17 y.o.	-14.687	-14.687	-0.026	-0.026	-0.034	-0.034
	[21.001]	[21.018]	[0.048]	[0.048]	[0.066]	[0.065]
18 y.o.	-4.653	-4.653	-0.006	-0.006	-0.009	-0.009
	[32.265]	[31.957]	[0.041]	[0.041]	[0.100]	[0.099]
19 y.o.	-12.549	-12.549	-0.006	-0.006	-0.010	-0.010
	[48.403]	[48.076]	[0.043]	[0.043]	[0.153]	[0.149]
20 y.o.	-46.153	-46.153	-0.043	-0.043	-0.074	-0.074
	[62.650]	[62.426]	[0.045]	[0.045]	[0.202]	[0.193]
21 y.o.	70.604	70.604	0.043	0.043	0.151	0.151
	[77.304]	[77.981]	[0.043]	[0.043]	[0.248]	[0.247]
22 y.o.	76.889	76.889	0.039	0.039	0.103	0.103
	[77.035]	[75.129]	[0.042]	[0.040]	[0.244]	[0.239]
23 y.o.	-1.854	-1.854	-0.008	-0.008	0.058	0.058
	[94.208]	[90.743]	[0.045]	[0.042]	[0.292]	[0.288]
24 y.o.	-1.868	-1.868	0.004	0.004	0.124	0.124
	[88.821]	[88.698]	[0.042]	[0.042]	[0.290]	[0.290]
25 y.o.	35.771	35.771	0.045	0.045	0.128	0.128
	[74.430]	[74.584]	[0.040]	[0.041]	[0.249]	[0.245]
26 y.o.	31.583	31.583	0.023	0.023	0.097	0.097
	[59.614]	[59.980]	[0.041]	[0.042]	[0.198]	[0.196]
27 y.o.	12.750	12.750	0.024	0.024	0.038	0.038
	[47.046]	[46.263]	[0.045]	[0.045]	[0.159]	[0.154]
28 y.o.	22.785	22.785	0.075	0.075	0.053	0.053
	[29.989]	[28.812]	[0.041]	[0.041]	[0.101]	[0.097]
29 y.o.	8.181	8.181	0.038	0.038	0.018	0.018
	[24.766]	[21.702]	[0.049]	[0.046]	[0.082]	[0.075]
30 y.o.	5.639	5.639	0.067	0.067	0.033	0.033
	[16.198]	[12.686]	[0.050]	[0.041]	[0.053]	[0.046]
31 y.o.	-6.090	-6.090	-0.006	-0.006	-0.004	-0.004
	[11.160]	[10.420]	[0.044]	[0.043]	[0.041]	[0.039]
32 y.o.	-1.167	-1.167	-0.002	-0.002	0.001	0.001
	[9.646]	[9.763]	[0.064]	[0.064]	[0.038]	[0.038]
33 y.o.	11.882	11.882	0.113*	0.113*	0.032	0.032
	[6.911]	[6.734]	[0.054]	[0.054]	[0.028]	[0.028]
34 y.o.	5.340	5.340	0.055	0.055	0.017	0.017
	[5.990]	[5.644]	[0.057]	[0.054]	[0.023]	[0.023]
35 y.o.	1.076	1.076	0.022	0.022	0.024	0.024
	[5.484]	[5.418]	[0.061]	[0.061]	[0.022]	[0.022]
N (number of	72	72	72	72	72	72
Linear trend in	Y	Y	Y	Y	Y	Y
Quadratic trend		Y		Y		Y
Calendar month	Y	Y	Y	Y	Y	Y

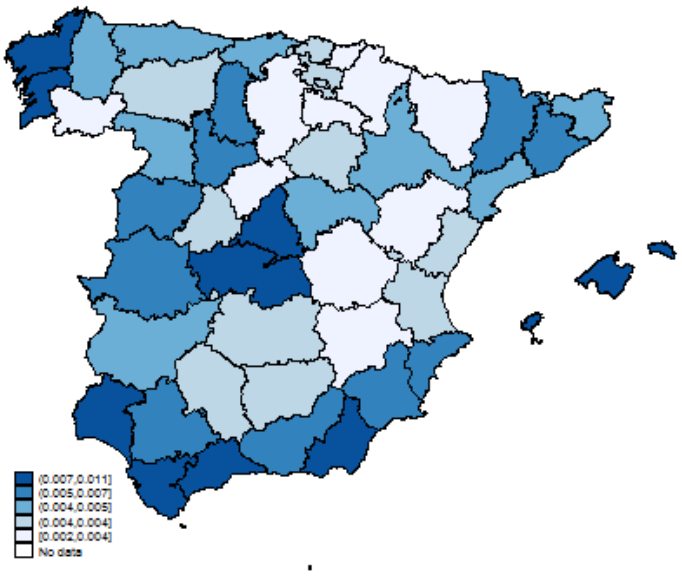
Notes: The table displays the coefficient of the variable *Post*, which takes the value 1 from Dec 1985 onwards and 0 otherwise.

Figure A1. Province variation in birth rates to women 18 and younger in 1984.



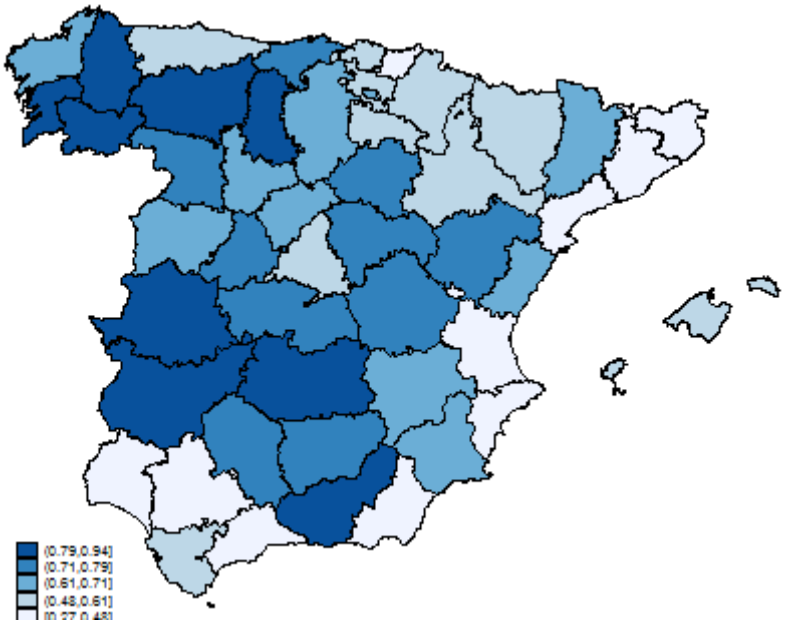
Notes: Authors' calculations based on birth-certificate data and female population data in 1984 (Source: Spanish National Statistical Institute). Birth rates to women 18 and younger in 1984 are defined as the number of births of mothers aged 18 or less per province in 1984 divided by female population of 15-19 years old per province.

Figure A2. Province variation in birth rates to unmarried women 21 or younger in 1984.



Notes: Authors' calculations based on birth-certificate data and female population data in 1984 (Source: Spanish National Statistical Institute). Birth rates to unmarried women 21 and younger in 1984 are defined as the number of births of unmarried mothers aged 21 or less per province in 1984 divided by female population of 15-19 years old per province.

Figure A3. Province variation in the fraction of women aged between 15-49 practicing Catholics in 1985



Source: 1985 Fertility Survey microdata, Spanish National Statistical Institute. Practicing catholic are those who actually practice the religion, for example, going to Mass every Sunday. Answers from the 1985 FS are missing for 7 provinces (Avila, Guadalajara, Huelva, Lleida, Segovia, Soria and Teruel) due to lack of enough sample size to be representative of the population of interest. To estimate the religiosity of these missing provinces we follow the multiple imputation methodology suggested by Rubin (1987) and regress the catholic practicing rate by province on a group of other indicators for the same or around years.