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Abortion legalization and childbearing in Mexico[1]

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Abstract

In 2007 abortion was legalized in the Federal District of Mexico, making the largest jurisdiction in Latin America, outside of Cuba, to allow women to have abortions on request during the first trimester of pregnancy. While the implications of the law for women's health and maternal mortality have been investigated, its potential association with fertility behavior has yet to be assessed. In this paper, we examine metropolitan area differences in overall and parity-specific, as well as the age pattern of childbearing between 2000 and 2010 to more precisely isolate the contribution of abortion legalization to fertility in Mexico. Our statistical specification applies difference-in-difference regression methods that control for concomitant changes in other socioeconomic predictors of fertility to assess the differential influence of the law across age groups. In addition, we account for prior fertility levels and change to better separate the effect of the law from preceding trends. Overall, the evidence suggests a systematic association between abortion legalization and fertility. The law appears to have contributed to lower fertility in Mexico City compared to other metropolitan areas and prior trends, though the influence is mostly visible among women aged 20-34 in connection with the transition to first and second child with limited impact on teenage fertility. There is some evidence that its effect might be diffusing to the greater Mexico City metropolitan area.

Fertility has fallen dramatically throughout Latin America in recent decades. In spite of this trend, the region is still marked by a number of pressing reproductive health concerns. Two aspects in particular, the early initiation of childbearing and high levels of unplanned fertility, continue to pose challenges to population policies and women's health. Mexico is a case in point. While the total fertility rate (TFR) declined from 6.5 in 1970 to 2.2 in 2010 (Mier y Teran & Partida, 2001; Mier y Teran 2011), teenage fertility remains common and the age pattern of childbearing remains young, with the mean age at first child remaining around 21 years of age between 1992 and 2006 and as many as 16 percent of women having their first child before age 18 (Guzman, Rodriguez, Martinez, Contreras, & Gonzalez, 2006; Juarez, Palma, Singh & Bankole, 2010; OECD, 2009). Moreover, unplanned and unwanted childbearing is common across all ages. In 2009, 34 percent of all pregnancies in Mexico were reported as unplanned/unwanted. The figure is particularly high among teenagers (42 percent) but even among 30-34 and 35 and older women, 14.4 and 32 percent of pregnancies were reported as unwanted, respectively (CONAPO, 2011). Together, the patterns highlight

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remaining limitations to women's control over their reproduction even in the context of rapid fertility decline.

In 2007, though, Mexico experienced a momentous change in population policy. In response to pressures from feminist organizations and other advocates of women's health, induced abortion was legalized in the federal district of Mexico (for an account of the forces contributing to the passage of the law see Kulczycki 2007, 2011). The change in policy turned Mexico City,[2] with a population of 8.8 million people, into the largest jurisdiction in Latin America outside of Cuba to permit abortions on request to women during the first trimester of pregnancy.[3] Several studies have investigated the consequences of legalized abortion for women's health and maternal mortality (Olavarrieta et al., 2012; Schiavon, Troncoso & Polo, 2012; Becker et al., 2011a; Becker et al., 2011b; Mondragon y Kalb et al., 2011; Maldonado, 2010). The extent to which legalization can influence fertility levels and the age pattern of childbearing, though, has not been assessed in the Mexican case even though abortion has long been regarded as a central proximate determinant of fertility.

In this paper we evaluate the implications of abortion legalization for childbearing in Mexico. Taking advantage of temporal and spatial differences in fertility trends and abortion policies across metropolitan areas we investigate the connection between the 2007 legislation in Mexico City and several dimensions of reproductive behavior including overall and parity-specific fertility as well as the age-pattern of childbearing. Legal access to abortion remains a highly contested and controversial aspect of population policy. Our study evaluates the effect of changing legal contexts rather than abortions per se on fertility.

Background: Abortion legalization in Mexico City

Despite being illegal, indirect estimates show that induced abortion was widely practiced throughout Mexico prior to the 2007 Mexico City reform with a demonstrated link with heightened maternal mortality (Juarez et al. 2008). In response to political forces, including advocacy from feminist groups and public health statistics on the high toll of illicit abortions on maternal mortality, in April of 2007 the Mexico City legislature decriminalized elective abortion in the first 12 weeks of pregnancy (Kulczycki 2007, 2011). The law mandates that abortion be available to women in the Federal District of Mexico Ministry of Health facilities, free of charge for Mexico City residents and on a sliding fee scale for residents of other areas of the country. The fee depends on socioeconomic status with the maximum fee equivalent to approximately 100 U.S. dollars (Becker & Diaz Olavarrieta, 2013). Moreover, there are at least two clinics that provide abortion services for free to all women, further reducing economic barriers to the procedure (Mondragon y Kalb et al., 2011). The one exception to the relatively open access to abortion relates to minors. Girls under 18 must obtain written parental or guardian consent and a parent or guardian must accompany her at her visits. Since abortion legislation in Mexico is made at the state level, the policy

[2]The Federal District of Mexico is a federal entity that is not part of any one of the 31 Mexican States. It is different from the larger Mexico City Metropolitan area which, in addition to the Federal District, includes the 60 adjacent municipalities of the states of Mexico and Hidalgo. For the purpose of our study, we refer to the Federal District of Mexico as Mexico City and to the municipalities surrounding the Federal District as the Greater Mexico City Metropolitan area.

[3]Abortion was subsequently legalized in Uruguay in 2008.

transformed Mexico City into the only geographic area within Mexico where abortion could be legally performed.

The impact of the law was far reaching. By 2012 more than 100,000 cumulative abortions had been performed in the District's Ministry of Health hospitals. As the policy became more established the number of abortions performed annually rose, from 13,404 in 2008 to 20,485 in 2012. The impact of the legislation has also reached women in other areas of Mexico, albeit slowly. In 2008, 76 percent of the women receiving abortion services were residents of Mexico City, while only 21 and 3 percent were from the state of Mexico (which includes the municipalities surrounding Mexico City) and the remainder of the country, respectively. By 2011, the composition has changed slightly, with 70 percent of abortions provided to residents of Mexico City, 24 to residents of the state of Mexico, and 6 percent to women from other states (GIRE, 2013). The law also allows for legal abortions to be provided in private clinics and information about the services is advertised and available on-line (see for instance, http://www.clinicas-aborto.com.mx/mexico/).

Several studies have examined the impact of establishing a public sector legal abortion program on various dimensions of women's health (van Dijk et al. 2011; Mondragón y Kalb et al. 2011). These studies have shown that roughly seventy percent of the procedures were performed free of charge and in accordance with safe abortion methods for first trimester procedures. The studies report that women are receiving high quality post-abortion contraceptive services and counseling for the prevention of unintended pregnancies; the most common contraceptive method accepted by women after abortion is an IUD (29 percent) followed by the pill (11 percent) and injectable methods (5 percent). An additional 6.9 percent chose condoms, while 16 percent chose no method. Since the establishment of the program, only 2.1 percent of women have had more than one procedure. The connection between abortion legalization and contraceptive services provision implies that the impact of the law on reproductive outcomes likely extends beyond facilitating access to the procedure.

Mondragón y Kalb and colleagues (2011) analyzed patient characteristics and services following abortion legalization. They document that the modal age of women receiving an abortion was between 20 and 24 years of age (36 percent). Only 5 percent of abortions were performed on women under age 18, and 12 percent were among women 18 or 19 years of age. Nearly one quarter (24.9 percent) of abortions were performed for women 30 years or older. Their results suggest that abortion might be connected with parity-specific fertility control, especially at lower parities; 32.5 and 26.3 percent of abortions were performed for women with no children or 1 child, respectively. Even though the majority of women were not in a union at the time of termination (60.8 percent) a sizeable 39.2 percent performed the procedure while in a union. Similarly, while most clients had relatively low levels of education (40.1 percent completed 9 or fewer years of formal schooling), 20.8 percent had 13 or more years, which is only slightly lower than the percent of women with higher education in Mexico City (25.2 percent). Thus, overall the evidence suggests that the policy is reaching a wide swath of the Mexican population. Moreover, it appears to be specifically contributing “to the prevention of repeat unintended pregnancies” (Mondragón y Kalb 2011: 159), potentially both through increased access and the associated provision of contraceptive services.

Nevertheless, abortion legalization remains a highly contested issue, particularly in regions such as Latin America where Catholicism predominates. Only 37 percent of Mexico City residents supported legalizing elective first-trimester abortions in 2007. Though support had increased to 74 percent by 2009 (Wilson et al., 2011), there has been considerable backlash as well. In the years following abortion legalization in Mexico City, 16 Mexican states have amended their constitutions to state that life begins at conception, and there is evidence that many have moved to more aggressively prosecute violators of the law (GIRE, 2012). According to journalistic accounts, in the state of Guanajuato between 2000 and 2008, 130 women were reported to the authorities for criminal prosecution after suffering complications from clandestine abortions and 20 pregnant rape victims were denied the procedure even though it was allowed under the Penal Code.[4] In all of Mexico, the number of women facing penal charges related to illegal abortions increased from 62 to 226 a year for the 1992-2007 and 2009-2011 periods, respectively.[5] State level constitutional amendments restricting abortion have been challenged in court, and the debate over the issue is far from settled.

Abortion legalization and fertility

Abortion has long been recognized as one of the proximate determinants of fertility, along with factors such as age at marriage, patterns of union dissolution, breastfeeding and other sources of postpartum infecundability, pathological sterility, and contraception (Bongaarts, 1987). Abortion legalization could in principle influence the fertility of a population if changing legal context affects the proximate determinants of fertility. The impact could include a direct effect of increased access to abortion but also more indirect effects related to changing any of the other proximate fertility determinants. Especially in the case of Mexico abortion legalization included the provision of high-quality contraceptive services and counseling for the prevention of unintended pregnancies which should also directly affect fertility. Empirically though, the main expectation is that within a country fertility rates would vary across areas in connection with different abortion regulations and this is irrespective of whether the effect stems from increased access to the procedure itself or post-procedure contraceptive services.

Previous research provides some support for this expectation. In Europe, studies found that fertility rates declined more rapidly in countries where abortion was legal and part of comprehensive family planning programs (David, 1992). In the United States it is estimated that abortion legalization led to a 5-8 percent decline in birthrates, with the largest declines occurring among teenagers, women older than 35, and unmarried women (Levine et al., 1999). In addition to being instrumental in reducing overall teenage birth rates, abortion legalization was even more significant in reducing out-of-wedlock teenage fertility (Donohue III et al. 2009; Kane and Staiger 1996).

The impact of legalizing abortion could be especially important in contexts of advanced but not fully completed fertility transitions, such as Mexico.[6] In the early stages of the

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[4] http://www.jornada.unam.mx/2009/03/10/index.php?section=estados&article=030n1est
[5] http://www.zocalo.com.mx/seccion/articulo/aumenta-el-aborto-en-mexico-1373808425
[6] http://www.un.org/esa/population/publications/completingfertility/completingfertility.htm

transition, reductions in family size can be achieved relatively rapidly through increased access to contraception, especially female sterilization, and diffusion of ideas about smaller families. The later stages of the transition, however, can be more difficult since they require much higher levels and more effective types of birth control. At these last stages, in addition to continuing the decline in overall fertility, contraception becomes increasingly important for affecting the timing of fertility as well as the convergence of desired and actual childbearing.

This recognition raises several specific but interrelated questions about the fertility impact of abortion legalization that directly relate to the reproductive health concerns that Mexico and other Latin American countries face in completing their fertility transition. The first is simply whether or not fertility levels fell faster in Mexico City in association with abortion legalization as compared to other areas in the country. Identifying overall declines in fertility rates would indicate that legalization is an important mechanism for further reducing unwanted childbearing in Mexico and achieving smaller families when desired.

The second and arguably more significant question in the contemporary Mexican and broader Latin American context is whether abortion legalization affected the age pattern of childbearing. Irrespective of its connection with overall fertility levels legalization might lead to a general shift in childbearing towards later ages, which again would be indicative of women's increased control over reproduction. The impact of legalized abortion on teenage childbearing is particularly important to assess. Much of teenage fertility is unwanted and abortion legalization could contribute to its prevention. Moreover, the specific comparison of fertility among minor and non-minor teenagers is particularly relevant in the Mexican case, as it relates to the requirement of parental consent for girls under 18 built into the 2007 legislation. In other contexts parental consent requirements have been shown to lower the abortion rate of minors (Ellerston 1997), though the issue has not been explored in Latin America.

The final question is whether abortion legalization affected parity specific birth rates. Accounts of fertility change have long distinguished between initiation and stopping behaviors. Fertility initiation, which relates to women's ability to delay the age at first childbirth, has heretofore not been characteristic of the demographic transition in Mexico or Latin America. Age at first birth has remained remarkably stable over the past several decades, even as fertility rates have plummeted. Stopping, in turn, refers to those practices aimed at completing childbearing after the desired number of children has been reached. Abortion legalization can independently affect these two parity- and age-specific fertility rates potentially contributing both to delays in fertility initiation (especially at younger ages) and reductions in higher parity birth rates.

Data, analytic strategy, and model specification

The data for the analysis come from the 10 percent public use samples of the 1990, 2000, and 2010 Mexican Censuses (INEGI, 2011) (Minnesota Population Center 2014). The three time points capture fertility behavior in a decade without local policy intervention (1990-2000) and before and after abortion legalization (2000-2010). We restrict the analysis to women of reproductive ages (14 to 49 years old) residing in the 60 Mexican metropolitan areas, including Mexico City and the Greater Mexico City Metropolitan area. In 2010 roughly 60 percent of Mexican women of reproductive age resided in a metropolitan area. The Censuses were collected by the Mexican National Institute of Statistics and Geography (INEGI). The public use samples are designed to provide individual level data representative at metropolitan level which is our unit of analysis.[7] One advantage of Census data is that they contain comparable information on age and number of children across samples, allowing us to consistently identify childbearing and parity in the prior year. In addition, they contain comparable information over time on women's educational attainment and labor force participation. More importantly, the large samples allow for metropolitan level comparisons not always possible with survey data.

Analytic Strategy: Difference-in-difference specification

Our analytical strategy to assess the connection between abortion legalization and changing fertility behavior is to compare changes in childbearing before and after the passage of the law in Mexico City with those exhibited in other metropolitan areas of the country, including the Greater Mexico City Metropolitan area. The comparison is a simple but robust strategy to identify whether the law has set Mexico City apart from other areas in terms of changes in birth rates. In the language of experimental designs, the strategy approaches a before and after comparison of outcomes in a treatment group (i.e., Mexico City), and control group (other metropolitan areas). The approach has been widely applied in policy evaluation, including studies on the effect of minimum wage policies on employment (Card and Krueger 1994), the impact of competition in the retail market and gas prices (Hastings 1994), how immigrant inflows shape the employment and wages of natives (Card 1992), and the role of immigration enforcement policies on the size of the foreign born population in local areas across the United States (Parrado 2012).

Statistically the approach implies applying difference-in-difference (DID) methodologies to capture the extent to which childbearing changes in Mexico City differ from the average change across other areas. In its most basic form, the DID estimate is computed by taking the difference in the likelihood of childbearing between 2000 and 2010 in Mexico City and subtracting it from the average difference observed across metropolitan areas that did not experience abortion legalization. A main strength of the approach is that the double difference or difference-in-difference removes the effect of permanent differences between the two groups as well as the effect of changes over time in the intervention group unrelated to the treatment, thus substantially reducing the omitted variable problems in cross-sectional analyses. With repeated cross-sections this implies estimating the following model,

$$\mathrm{logit}(\Pr(y=1))=\beta_g \mathrm{AGE}_g+\beta_1 Y2010+\beta_2 \mathrm{MC}+\delta Y2010^{*}\mathrm{MC}+\beta_n \mathrm{X}_n \quad [1]$$

[7]A detailed description of the methodology used by the statistical office to collect census data can be found at http://www.inegi.org.mx/est/contenidos/espanol/metodologias/censos/sm_cpv2010.pdf. The information is also available at IPUMS International at https://international.ipums.org/international-action/sample_details#mx.

where *y* equals 1 if a woman had a child in the past year and 0 otherwise. AGE_g is a set of 6 mutually exclusive dummy variables indexing the following age groups: 14-17, 18-19, 20-24, 25-29, 30-34, and 35+. β_g are age-group specific coefficients capturing the age pattern of childbearing. Since the model does not include a constant term, β_g parameters measure fertility propensities by age. We separate the 14-17 year old group from other teenagers to examine the potential impact of the law's parental notification requirement for minors under 18. *Y2010* and *MC* are dummy variables that equal 1 if census year is 2010 and residence is in Mexico City, respectively and 0 otherwise and β_1 and β_2 are parameters to be estimated. *Y2010*MC* is an interaction term between year 2010 and residence in Mexico City and δ is the DID estimate

$$\mathrm{E}[y|\mathrm{Y2010}=1,\mathrm{MC}=1]-\mathrm{E}[y|\mathrm{Y2010}=0,\mathrm{MC}=1]-\mathrm{E}[y|\mathrm{Y2010}=1,\mathrm{MC}=0]-\mathrm{E}[y|\mathrm{Y2010}=0,\mathrm{MC}=0]$$

which is interpreted as the effect of legalization on the likelihood of having a child in the previous year net of other changes. X_n is a vector of individual and local area controls which include three dummy variables indexing whether a woman completed secondary education, is working in non-professional occupations, and is working in professional occupations and two aggregate-level metropolitan indicators: the percentage of women with secondary education and the percent working. The metropolitan indicators are computed aggregating the individual level information in the Censuses. Descriptive statistics for the main variables in the analysis are reported in Appendix A.

Computing interaction terms in non-linear models has been much discussed in the literature, with studies highlighting that they produce different results from those obtained in linear models. Ai and Norton (2003), for instance, showed that the coefficients for interaction terms in non-linear models can sometimes yield opposite signs from the marginal effects. In the case of non-linear DID specifications though, Puhani (2008) has shown that it is appropriate to focus on the interaction term since the treatment effect is the parameter of interest. In the DID specification the interaction term in non-linear models simplifies to the incremental effect of the coefficient of the interaction term so that the coefficient of the interaction term has the same sign as the treatment effect.

We expand the basic DID approach in two main ways. First, since Mexico City led fertility change in Mexico even before the passage of abortion legalization, it is important to control for prior fertility levels and trends in models predicting fertility differentials in the post-legalization period. Accounting for prior fertility conditions better separates the changes occurring between 2000 and 2010 from trends already underway in the prior decade. These controls increase the robustness of our findings and better separate the fertility changes associated with legalization from other changes in area-specific conditions. Failure to account for prior conditions is a major concern in cross-time comparisons of local areas since observed changes could be driven by factors other than policy changes. Empirically, this implies that if abortion legalization has set Mexico City apart in terms of changes in childbearing then fertility estimates would differ across areas even after accounting for pre-existing fertility levels and change.[8]

Second, we extend the simple two-group before and after comparison of Mexico City to multiple groups. Several specific dimensions of the Mexican case justify extending the two-group comparison. While the applicability of the law is restricted to Mexico City, access to the clinics is open to all women irrespective of place of residence. Thus, it is possible that the law's effect diffused to other geographic areas. This might be particularly the case for the municipalities surrounding Mexico City. As reported above, as many as a quarter of reported abortions were performed to women from the neighboring state of Mexico and only 3 percent to women from other states. Accordingly, we also investigate the changes in the 60 municipal districts that are part of the Greater Mexico City (GMC) metropolitan area; 59 of the municipalities are in the state of Mexico and one in Hidalgo. If the impact of abortion legalization is diffusing to areas outside of Mexico City then the association should be especially evident in the changing fertility rates in the GMC area.

In addition, as discussed above, the passage of the law motivated several states to introduce constitutional amendments further penalizing and restricting the procedure. If constitutional amendments affected fertility rates in the opposite direction of legalization then failure to control for the unique conditions in these states will bias the estimated association between abortion legalization and fertility. Accordingly, we also investigate changes in metropolitan areas located in a state that passed an anti-abortion constitutional amendment prior to 2009. A total of 9 states (Baja California, Colima, Durango, Guanajuato, Morelos, Nayarit, Puebla, Quintana Roo, and Sonora)[9] fall under this category, resulting in 19 metropolitan areas in states that passed constitutional amendments (Cancún, Celaya, Colima-Villa de Álvarez, Cuautla, Cuernavaca, Guaymas, La Laguna, La Piedad-Pénjamo, León, Mexicali, Moroleón-Uriangato, Puebla-Tlaxcala, Puerto Vallarta, San Francisco del Rincón, Tecomán, Tehuacán, Tepic, Teziutlán, Tijuana). Together these extensions result in a four-group comparison: Mexico City (MC); the Greater Mexico City Metropolitan area (GMC); metropolitan areas in states with Constitutional Amendments (CAM); and other metros. The other metros control group includes 39 metropolitan areas.

We thus extend equation 1 in the following way:

$$\begin{aligned}\mathrm{logit}(\Pr(y=1)) = {} & \beta_{0g}\mathrm{AGE}_g + \beta_{1g}\mathrm{AGE}_g{}^{*}\,Y2010 + \xi_1\mathrm{MC} + \xi_2\mathrm{MC}^{*}\,Y2010 + \\ & + \lambda_1\mathrm{GMC} + \lambda_2\mathrm{GMC}^{*}\,Y2010 + \delta_1\mathrm{CAM} + \delta_2\mathrm{CAM}^{*}\,Y2010 + \\ & + \theta_1\mathrm{ASFR}_{90} + \theta_2\Delta_{-}\,\mathrm{ASFR}_{90-00} + \beta_n\mathrm{X}_n \end{aligned} \quad [2]$$

where AGE_g is a set of 6 mutually exclusive dummy variables indexing the age groups described above and $AGE_g{*}Y2010$ is a set of interaction terms between the age-specific groups and year 2010. β_{0g} and β_{1g} are coefficients measuring fertility propensities in 2000 and the change between 2000 and 2010 in the control group, respectively. *MC*, *GMC*, and

[8]We conducted several sensitivity analyses. We estimated aggregate linear models with change in fertility rates as the dependent variable as well as count models predicting number of births. At the individual level we estimated separate DID models investigating changes between 1990 and 2000 and 2000 and 2010 and compared results. In addition, we compared the DID estimates to results obtained from linear probability models. Substantive results, available upon request, are consistent across specifications.

[9]An additional two states passed constitutional amendments after 2009. Since this is after our period of observation, they are not included in our dummy variable definition.

CAM are dummy variables indicating the three metropolitan groups described above and *MC* Y2010*, *GMC* Y2010*, and *CAM* Y2010* are the interaction terms between metropolitan area and year 2010. ξ_2, λ_2, and δ_2 are the DID parameters of interest. They measure the change in fertility propensities between 2000- 2010 for each geographic area and the extent to which changes in these areas differ from the changes observed in control areas. In the case of MC for instance, ξ_2 is then:

$$\mathrm{E}[y|\mathrm{Y2010}{=}1,\mathrm{MC}{=}1,\mathrm{GMC}{=}0,\mathrm{CAM}{=}0]-\mathrm{E}[y|\mathrm{Y2010}{=}0,\mathrm{MC}{=}1,\mathrm{GMC}{=}0,\mathrm{CAM}{=}0]- \\ -\mathrm{E}[y|\mathrm{Y2010}{=}1,\mathrm{MC}{=}0,\mathrm{GMC}{=}0,\mathrm{CAM}{=}0]-\mathrm{E}[y|\mathrm{Y2010}{=}0,\mathrm{MC}{=}0,\mathrm{GMC}{=}0,\mathrm{CAM}{=}0]$$

ASFR_{90} and $\Delta\_\mathrm{ASFR}_{90\text{-}00}$ are the age-specific fertility rate in 1990 and the difference in fertility rates between 1990 and 2000 for women in the same age group by metropolitan area, respectively. X_n are the metropolitan area controls described above and θ_1, θ_2, and β_n are parameters to be estimated.

While equation 2 captures overall changes in childbearing it does not assess age-specific differences, which is necessary for understanding the connection between abortion legalization and fertility timing. Technically, this implies extending equation 1 to incorporate age-place and age-place-year interactions so that:

$$\mathrm{logit}(\mathrm{Pr}(y{=}1)){=}\beta_{0g}\mathrm{AGE}_g{+}\beta_{1g}\mathrm{AGE}_g{}^{*}Y\,2010{+}\xi_{1g}\mathrm{AGE}_g{}^{*}\mathrm{MC}{+}\xi_{2g}\mathrm{AGE}_g{}^{*}\mathrm{MC}^{*}\,Y\,2010{+} \\ {+}\lambda_{1g}\mathrm{AGE}_g{}^{*}\mathrm{GMC}{+}\lambda_{2g}\mathrm{AGE}_g{}^{*}\mathrm{GMC}^{*}\,Y\,2010{+}\delta_{1g}\mathrm{AGE}_g{}^{*}\mathrm{CAM}{+}\delta_{2g}\mathrm{AGE}_g{}^{*}\mathrm{CAM}^{*}\,Y\,2010{+} \\ {+}\theta_1\mathrm{ASFR}_{90}{+}\theta_2\Delta_{\_}\ \mathrm{ASFR}_{90-00}{+}\beta_n\mathrm{X}_n$$

[3]

where *AGE*$_g$**MC*; *AGE*$_g$**GMC*; and *AGE*$_g$**CAM*; are interaction terms between age groups and metropolitan areas. ξ_{1g}, λ_{1g}, and δ_{1g} are coefficients estimating age-specific differences in likelihood of childbearing in MC, GMC, and CAM areas relative to control areas in 2000. *AGE*$_g$**MC*Y2010, AGE*$_g$**GMC*Y2010*, and *AGE*$_g$**CAM*Y2010* are three way interaction terms between age-group, area of residence, and year 2010. ξ_{2g}, λ_{2g}, and δ_{2g} are the DID parameters of interest that measure the extent to which the age-specific changes infertility propensities between 2000-2010 in a given area differs from the changes observed in control areas, respectively. In the case of 14-17 year-old women in MC for instance, $\xi_{2,14\text{-}17}$ is then:

$$\mathrm{E}[y|\mathrm{Y2010}{=}1,\mathrm{AGE}(14-17){=}1,\mathrm{MC}{=}1,\mathrm{GMC}{=}0,\mathrm{CAM}{=}0]-\mathrm{E}[y|\mathrm{Y2010}{=}0,\mathrm{AGE}(14-17){=}1,\mathrm{MC}{=}1,\mathrm{GMC}{=}0,\mathrm{CAM}{=}0]- \\ -\mathrm{E}[y|\mathrm{Y2010}{=}1,\mathrm{AGE}(14-17){=}1,\mathrm{MC}{=}0,\mathrm{GMC}{=}0,\mathrm{CAM}{=}0]-\mathrm{E}[y|\mathrm{Y2010}{=}0,\mathrm{AGE}(14-17){=}1,\mathrm{MC}{=}0,\mathrm{GMC}{=}0,\mathrm{CAM}{=}0]$$

Comparisons of the size, direction, and significance of the age-specific estimates assess the age-dependent impact of abortion legalization. We extend the specification presented in equations 2 and 3 to the analysis of parity specific fertility rates that predict the likelihood of a woman having a first, second, and third or more children (i.e. the dependent variable *y* equals 1 if a woman had a first, second, and third or more children in the previous year). We correct for the clustering of individual observation within metropolitan areas by estimating robust standard errors (Long & Ervin 2000).

Results

Before turning to the results from DID models, we present descriptive statistics on changes in total and age-specific fertility rates[10] obtained from aggregating the micro-level information on childbearing during the prior year to contextualize our analysis. Results in Table 1 show, as expected, that fertility rates in Mexico City are much lower than in other metropolitan areas and the difference was already present in 1990. In 2010 the TFR was 1.646 in Mexico City, well below replacement level, but averaged 2.111 in the GMC, 2.284 in the CAM areas; and 2.329 in other metros. The same pattern of metropolitan differentials is observed across parity-specific rates.

The age pattern of childbearing also shows important differences by area. Overall, ASFRs are lower at young ages, peak between ages 20-24, and then decline. Comparison of average rates by metro-group indicates that differences in rates are less pronounced at the very early and advanced childbearing ages relative to the prime reproductive ages from 18 to 34. In MC the fertility rate for 14 to 17 year-olds in 2010 was 0.023 which was not dramatically lower than the average rate observed in the GMC area (0.024), CAM (0.026), or other metros (0.033). Differences become more pronounced when we consider older ages. For instance, in 2010 the fertility rate for 18 to 19 year-olds in MC was close to 0.030 children lower than the average in other metro areas and the gap was largest (0.040) among the prime childbearing ages of 20-24.

Difference-in-difference estimates

The next set of analyses models these changes following our DID specification. Table 2 reports coefficients from DID logistic regression models (equation 1) predicting the likelihood of having a child in the prior year (Column 1) and by parity (Columns 2, 3, and 4). The main effects for area of residency and the interaction terms with 2010 Census years (ξ_2, λ_2, and δ_2 in Equation 2, respectively) are the main parameters of interest as they assess the distance separating the childbearing patterns in our three metro types after legalization from those observed in the control group.

The coefficients for the age-main effects in column 1 describe the age-pattern of childbearing in the control group in year 2000. Estimates for the interaction terms between age and year 2010 document that, consistent with the descriptive results, there has been considerable decline in fertility propensities across all age groups between 2000 and 2010. The only exception is among 14 to 17 year old women where the interaction term shows no change in fertility propensities. The metro area main effects in column 1 also document that

[10]Formally, the TFR and ASFR for metropolitan area m and year t is $TRF(m, t) = \Sigma_X ASFR(a, m, t) = \Sigma_a(B(a, m, t)/N(a, m, t))$ where $B(a, m, t)$ equals the number of births to women aged a in metropolitan area m at time t and $N(a, m, t)$ is the number of women aged a in metropolitan area m at time t.

even net of socioeconomic controls, the likelihood of having a child was -0.03 and -0.02 times lower in MC and GMC than in control areas in 2000, respectively. More important for our purposes, the DID results show that between 2000 and 2010 the likelihood of childbearing declined -0.04 points *more* in MC relative to the decline observed in control areas. In substantive terms, this implies that the passage of abortion legalization coincided with a 4 percentage point reduction in the probability of childbearing in MC as compared to the changes in other areas. That this result is unique to MC is reinforced by the DID estimates for the GMC and CAM which show no significant differences in fertility changes in these areas relative to the control group. The disparity in estimates implies that while we observe a significant reduction in childbearing in MC in association with abortion legalization there was no diffusion, at least in overall childbearing, to the GMC metro area.

Columns 2, 3, and 4 report coefficients from equivalent DID logistic regression models predicting the likelihood of having a first, second, or third and higher birth, respectively. Results support the expectation that the impact of the law is parity dependent. The DID estimates for MC show considerable reductions in the likelihood of having a first and second child relative to control areas between 2000 and 2010. Results show that women residing in MC experienced an additional -0.09 and -0.11 point reduction in the likelihood of having a first and second child, respectively, between 2000 and 2010 relative to the changes observed in control areas. Interestingly, the pattern is reversed for fertility at three or higher parities. The DID estimate shows that the likelihood of a third or higher order birth increased 0.09 points in MC relative to the control group than in 2000. Thus, even though fertility rates were lower overall in MC by 2010, abortion legalization appears to have significantly reduced fertility at lower parities with a compensating effect at higher parities. The finding is more consistent with a pattern of delayed childbearing rather than growing childlessness.

Interestingly, some of the parity-specific effects are also present in the GMC area. The DID estimate for first and second child indicate that between 2000 and 2010 fertility propensities declined an additional -0.04 and -0.08 points in the GMC area relative to the control group, respectively. The decline is significantly smaller than in MC. Also, similar to MC, there appears to be a compensating positive change (0.07) at third and higher parities. The fact that no comparable change is visible in CAM areas further suggests that the change is unique to abortion legalization in MC and that some of the fertility reducing effect might be diffusing to the GMC area, at least at lower parities.

The bottom part of Table 2 reports the coefficients for the effect of individual and contextual level controls on childbearing. While not constructed as predictors of childbearing decisions, since they are partially endogenous to fertility, they account for socioeconomic correlates that could be confounding the DID estimates reported above, and thus add robustness to our findings. Results show that being employed is associated with reduced likelihood of having children, and the effect is consistent across parities and for professional and non-professional occupations. Educational attainment, on the other hand, is related to both overall and parity-specific fertility. Women with more than secondary education average lower fertility overall; while they are more likely than less educated women to achieve first and second parity, they are far less likely to continue to bear three or more children. Contextual indicators controlling for aggregate level socioeconomic climate show that net of individual characteristics, better economic climate, as indicated by the percent of women working, increases the likelihood of childbearing while higher aggregate levels of educational attainment tend to reduce it. The role of prior fertility context documents the momentum built into fertility changes. The likelihood of childbearing is higher in areas with higher fertility levels in 1990 and is also higher in areas with lower fertility declines between 1990 and 2000.

Age-specific difference-in-difference estimates

Table 3 reports the results of the logistic regression DID model predicting the likelihood of having a child in the previous year that includes age-year and age-area-year interactions (Equation 2). The model investigates the extent to which there is an age-dependency within the overall effects reported above. The main parameters of interest are the coefficients for the interactions between age group and year 2010, which measure period changes in the control group of metro areas, and the three way interactions between age group, area of residency, and year 2010, which are the DID estimates for our metro types (Column 2). The interaction terms between age and year 2010 document that net of individual and contextual characteristics as well as prior fertility trends, the likelihood of childbearing declined for all age groups in the control metros by 2010. The only exception is 14 to 17 year old women who did not experience any significant change in fertility propensities. The interaction terms between area of residence and age group (Column 1) show that in 2000 fertility levels tended to be generally lower in MC and GMC than in control areas with no differences in CAM areas.

The DID estimates resulting from the three-way interactions are our main parameters of interest. They show that in MC the fertility of 14 to 17 year olds actually increased (0.08) relative to the changes in control areas. This is in part the result of childbearing being dramatically lower in 2000 among this group in MC as compared to control areas. Nevertheless, it does indicate that abortion legalization did not affect the fertility behavior of women under 18. Moreover, the same applies to women aged 18 to 19. The DID estimate for MC among this group shows no significantly different change in fertility propensities between 2000 and 2010 as compared to control areas.

While teenage fertility did not seem to respond to abortion legalization, its impact on 20 to 24 and 25 to 29 year-old women was pronounced. Results show that the likelihood of childbearing among these age groups declined an additional -0.12 and -0.18 points, respectively, between 2000 and 2010, as compared to the change in control areas. Moreover, the change is not observed in GMC or CAM areas, reinforcing the expectation that the difference is the result of abortion legalization and not the continuation of prior fertility patterns or general trends. Interestingly, there appears to have been a compensating effect among older women. The DID estimate for MC shows that by 2010 the likelihood of childbearing among women over 35 increased 0.29 points. The age dependent pattern of results is consistent with the expectation that abortion legalization is contributing to delaying fertility towards older ages.

The DID estimates for the CAM area suggests that there might have been some diffusion effect among 25 to 29 and 30 to 34 year old women. Results indicated that the likelihood of childbearing among these groups declined -0.08 and -0.06, respectively, by 2010 compared to control areas.

Parity and age-specific difference-in-difference estimates

Table 4 reports summary results of comparable logistic regression DID models predicting the likelihood of having a first, second, and a third or higher order child in the prior year to investigate the extent to which the effects are parity dependent. We report estimates only for the effects of age, interaction between age and metro area, and the three way interaction between age, area, and year 2010. Columns 1 and 2 report the coefficients for age-group and year interactions by parity, which measure initial level and period changes in fertility in the control group of metro areas between 2000 and 2010. Columns 3 through 8 report for each metro type the estimates for the interactions between age and metro area and three-way interactions between age-group, area of residency, and year by parity, which are the DID estimates for our four metro types by year.

Results for the interaction terms between age and year 2010 by parity (Column 2), show that fertility declined across all age groups and parities in control metros. Once again, the only exception is changes in the likelihood of first child among 14 to 17 year old women where the interaction term shows no significant effect. Also, as could be expected, the negative effects tend to become more pronounced at higher parities.

The DID estimates for MC (Columns 4) indicate, as before, that the likelihood of having a first child for 14 to 17 year olds increased in MC (0.09) relative to the control group by 2010. Once again this is in part the product of the much lower level at the beginning of the period. Interestingly, though, there is evidence that the likelihood of having a first child was significantly reduced among 18 to 19 year old women in MC between 2000 and 2010 relative to control metros (-0.10). The age-pattern of change provides some evidence that the requirement for parental consent among minors is producing a disparate impact of legalization even within the teenaged group.

The most consistent fertility reducing effect of abortion legalization is evident among women in their prime reproductive ages (20 to 34). Comparing the DID estimates for 2010 shows a considerable 14, 24, and 12 additional percentage point reduction in the likelihood of having a first child in association with abortion legalization among 20 to 24, 25 to 29, and 30 to 34 year-old women, respectively, as compared to the changes in the control metros. We find similar pattern for the DID estimates obtained for the likelihood of having a second child in MC. Specifically, our estimates show a considerable 20, 26, and 13 additional percentage point reduction in the likelihood of having a second birth in association with abortion legalization among 20 to 24, 25 to 29, and 30 to 34 year-old women, respectively, relative to the control group. No fertility reducing effect is found for the transition to third child.

Parity specific estimates further suggest that the effect of abortion legalization is diffusing to the GMC area (Columns 6). The DID estimates for 2010 show significant additional reductions in the likelihood of having a first child in GMC relative to control areas among women aged 25 to 29 and 30 to 34 (-.13 and -.24, respectively). A similar pattern is also evident for the transition to second child. The DID estimates show that the likelihood of a second child among 20 to 24, 25 to 29, and 30 to 34 year-old women declined an additional 4, 13, and 21 points more in GMC than in control areas by 2010. The change, though, is significantly smaller in size than the one estimated for MC. The fact that no discernible pattern of change is observable for CAM areas further reinforces the interpretation that abortion legalization set MC apart from the rest of Mexico in terms of fertility behavior and that some of the effect have diffused to GMC.

Conclusions

Mexico City's legalization of first-trimester abortion in 2007 is of tremendous significance for Latin America. The change set a precedent for an alternative view of the reality of induced abortion and how reproductive health issues could be treated across the region. Reproductive health advocates and promoters of women's rights applauded the measure since illicit abortions have had long-standing negative consequences for maternal mortality and other dimensions of women's health (Kulczycki 2011). From a population policy perspective induced abortion has historically accompanied the fertility transition in Latin America. The legalization of the practice together with the expanded reproductive health services offered to the women undertaking the procedure has the potential to shape fertility outcomes. Understanding whether abortion legalization is associated with changes in the timing and number of births is central for developing a more precise account of the obstacles to family planning in Mexico, with important implications for the formulation of more targeted population policies that can facilitate the diffusion of reproductive health and women's control over reproduction in Latin America.

This paper evaluated the fertility implications of abortion legalization in Mexico in light of ongoing discussions surrounding the completion of the fertility transition in Latin America. We focused on three interrelated questions, namely whether abortion legalization had a discernable impact on fertility decline; whether it affected the age pattern of childbearing, including teenage fertility; and whether it differentially affected fertility initiation and stopping behaviors.

Results document a systematic association between legalization and fertility change in Mexico. In comparing change in childbearing propensities between 2000 and 2010 we estimate that abortion legalization reduced the number of births in Mexico City by an additional 4 percent relative to the changes that would have occurred without the law. In terms of number of births, the estimate implies that abortion legalization prevented approximately 4 thousand births in Mexico City in 2010 which is much smaller than the actual number of public clinic abortions, reinforcing the expectation that most legal abortions replaced clandestine abortion which would have occurred anyway.

We also found that abortion legalization impacted the age pattern of childbearing, which remains of heightened concern in Mexico and many other Latin American countries where the fertility transition has progressed but remains incomplete. In spite of overall changes though, abortion legalization did not alter the trend in teenage childbearing in Mexico City. Teenage fertility in Mexico, as well as in other Latin American countries, has remained stubbornly high with signs that it might actually be increasing in some contexts. Much of teenage fertility is unwanted and its regulation has been a concern in population policy discussions. Even though abortion legalization could have potentially reduced the level and trend our analysis indicates that the law has not reached the fertility behavior of teenage women. This might be connected to the requirement of parental concern for women under 18 years of age.

The impact of the law was particularly visible among women aged 20 to 29, reducing their probability of childbearing between 12 to 18 percent and contributing to later timing of childbearing in Mexico City relative to the changes that occurred in other areas of Mexico or in prior decades. The finding is reinforced in parity specific analyses of fertility change that document that the law was particularly instrumental in reducing transitions to first and second child in Mexico City rather than higher order parities.

The implications of the law for fertility behaviors outside of Mexico City are less consistent. We found some evidence of diffusion to the surrounding greater metropolitan Mexico City area but only for older age-groups. Similarly, we found no impact of the Constitutional Amendments enacted in some states as a reaction against abortion legalization in Mexico City on fertility behaviors in those areas.

A few caveats are in order though. While our statistical design captures changes in childbearing propensities over time it does not directly measures changes in women's behavior. Specifically, individual level survey data, including retrospective fertility and contraceptive histories, is needed to specifically investigate the connection between legalization and reproductive health. Similarly, more direct evidence is needed to better separate the effects stemming from legal access to the procedure from those arising from the expansion of contraceptive counselling to prevent subsequent unwanted childbearing. Irrespective of the direct mechanism, though, abortion legalization appears to have expanded women's control over their reproduction. To the extent that the effect is a response to unsatisfied demand for contraception our results support perspectives that recognize in the passage of the legislation an alternative approach to reproductive health that through a comprehensive provision of contraceptive services not only reduces the risks associated with illicit abortions but also further expands women's decision making capacity.

Appendix A: Descriptive statistics

	Mean	S.D.
Age-groups		
14-17	0.14	(0.35)
18-19	0.07	(0.25)
20-24	0.17	(0.37)
25-29	0.16	(0.37)
30-34	0.14	(0.35)
35+	0.32	(0.47)
Year		

	Mean	S.D.
2010	0.56	(0.50)
Metro area		
df	0.15	(0.36)
sma	0.18	(0.38)
law	0.20	(0.40)
Individual and metro area controls		
Secondary educ.	0.66	(0.47)
Non-prof. occup.	0.34	(0.47)
Professional	0.09	(0.29)
% secondary educ.	0.67	(0.09)
% working	0.43	(0.05)
Prior fertility context		
ASFR in 1990	7.03	4.47
Dif. in ASFR (1990-2000)	-0.61	2.56
N	2,151,115	

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Table 1

Average Total and Age-Specfic Fertility Rates by Area In Mexico, 1990, 2000 and 2010

	Mexico City			GMC			Cities Const. Mod.			Control Group: Other Cities		
Age	**1990**	**2000**	**2010**	**1990**	**2000**	**2010**	**1990**	**2000**	**2010**	**1990**	**2000**	**2010**
14-17	0.011	0.016	0.020	0.016	0.023	0.024	0.017	0.029	0.026	0.015	0.028	0.033
18-19	0.057	0.071	0.065	0.079	0.097	0.090	0.079	0.104	0.094	0.078	0.099	0.095
20-24	0.107	0.104	0.082	0.143	0.138	0.132	0.145	0.151	0.124	0.141	0.144	0.127
25-29	0.122	0.109	0.080	0.146	0.131	0.107	0.160	0.152	0.125	0.158	0.139	0.121
30-34	0.094	0.086	0.068	0.108	0.091	0.072	0.125	0.109	0.085	0.111	0.100	0.093
35-39	0.052	0.043	0.042	0.060	0.048	0.038	0.077	0.058	0.047	0.070	0.051	0.045
40-44	0.024	0.012	0.013	0.034	0.016	0.013	0.052	0.024	0.014	0.037	0.016	0.013
45-49	0.015	0.003	0.003	0.027	0.006	0.004	0.032	0.008	0.004	0.025	0.005	0.003
Average TFR	2.227	1.993	1.646	2.813	2.438	2.111	3.178	2.836	2.284	2.920	2.591	2.329
Weighted N (000s)	2,457	2,641	2,590	2,061	2,901	3,327	2,191	3,035	3,809	5,467	7,258	8,804
Differences in rates		90-00	00-10		90-00	00-10		90-00	00-10		90-00	00-10
14-17		0.005	0.003		0.008	0.001		0.012	-0.003		0.013	0.005
18-19		0.014	-0.007		0.017	-0.006		0.025	-0.010		0.022	-0.004
20-24		-0.003	-0.022		-0.004	-0.006		0.006	-0.027		0.003	-0.017
25-29		-0.014	-0.029		-0.015	-0.023		-0.008	-0.027		-0.019	-0.018
30-34		-0.008	-0.018		-0.017	-0.019		-0.016	-0.024		-0.011	-0.007
35-39		-0.009	-0.001		-0.012	-0.010		-0.019	-0.011		-0.018	-0.007
40-44		-0.012	0.001		-0.018	-0.003		-0.027	-0.010		-0.021	-0.003
45-49		-0.012	0.000		-0.021	-0.002		-0.024	-0.005		-0.020	-0.003
Difference in Avg. TFR		-0.234	-0.351		-0.376	-0.328		-0.342	-0.548		-0.329	-0.266

Table 2

Coefficients from DID logistic regression models predicting having a child in the previous year and by parity (robust standard errors in parenthesis)

	All	Parity 1	Parity 2	Parity 3+
	(1)	(2)	(3)	(4)
Age main effects				
14-17	-3.93 ** (0.12)	-4.36 ** (0.17)		
18-19	-3.62 ** (0.15)	-4.23 ** (0.20)	-6.21 ** (0.25)	
20-24	-3.75 ** (0.17)	-4.78 ** (0.21)	-5.86 ** (0.27)	-6.00 ** (0.24)
25-29	-3.76 ** (0.16)	-5.35 ** (0.20)	-5.92 ** (0.25)	-5.17 ** (0.23)
30-34	-3.71 ** (0.13)	-5.91 ** (0.17)	-5.97 ** (0.21)	-4.50 ** (0.23)
35+	-4.39 ** (0.10)	-7.00 ** (0.16)	-6.92 ** (0.16)	-4.60 ** (0.20)
Interaction: Age*Year 2010				
14-17	-0.04 (0.03)	-0.01 (0.05)		
18-19	-0.13 ** (0.03)	-0.09 ** (0.04)	-0.31 ** (0.06)	
20-24	-0.19 ** (0.02)	-0.19 ** (0.04)	-0.24 ** (0.04)	-0.27 ** (0.06)
25-29	-0.18 ** (0.03)	-0.17 ** (0.06)	-0.24 ** (0.04)	-0.20 ** (0.05)
30-34	-0.15 ** (0.02)	0.06 (0.05)	-0.11 ** (0.05)	-0.27 ** (0.05)
35+	-0.19 ** (0.04)	0.05 (0.06)	0.09 ** (0.05)	-0.31 ** (0.06)
Metro area main effects				
Mexico City	-0.03 ** (0.03)	0.05 (0.04)	0.11 ** (0.05)	-0.13 ** (0.06)
Greater MC	-0.02 ** (0.01)	-0.02 (0.02)	0.05 ** (0.02)	-0.04 (0.04)
Ammended Met.	0.01 (0.02)	-0.05 ** (0.02)	-0.02 ** (0.03)	0.08 (0.05)
DID estimates (metro area * year interactions)				
MC*2010	-0.04 ** (0.01)	-0.09 ** (0.02)	-0.12 ** (0.02)	0.09 ** (0.02)
GMC*2010	-0.01 (0.01)	-0.04 ** (0.02)	-0.08 ** (0.02)	0.07 ** (0.02)
AM*2010	-0.04 (0.03)	-0.01 (0.04)	-0.02 ** (0.04)	-0.07 (0.07)
Individual and metro area controls				
Secondary educ	-0.16 ** (0.02)	0.16 ** (0.02)	0.05 ** (0.02)	-0.59 ** (0.02)
Non-prof. occup.	-0.90 ** (0.02)	-0.68 ** (0.02)	-0.93 ** (0.02)	-0.91 ** (0.02)
Professional	-0.75 ** (0.03)	-0.16 ** (0.03)	-0.72 ** (0.04)	-1.34 ** (0.04)
% secondary educ.	0.57 ** (0.15)	0.61 ** (0.21)	1.21 ** (0.30)	1.03 ** (0.43)
% working	0.36 ** (0.18)	0.44 ** (0.24)	0.67 ** (0.41)	-0.76 (0.52)
Prior fertility context				
ASFR in 1990	0.14 ** (0.01)	0.11 ** (0.01)	0.17 ** (0.02)	0.21 ** (0.01)
Dif. in ASFR (1990-2000)	0.08 ** (0.01)	0.08 ** (0.01)	0.09 ** (0.01)	0.10 ** (0.01)
PseudoL (000s)	-464.7	-211.5	-189.0	-197.0

	All	Parity 1	Parity 2	Parity 3+
	(1)	**(2)**	**(3)**	**(4)**
N (000s)	2,151	2,151	2,151	2,151

** p<=.05

Table 3

Coefficients from DID logistic regression model predicting having a child in the previous year: Age-specific effects (robust standard errors in parenthesis)

	(1)	(2)
Age Main Effects		**Age* Year 2010**
14-17	-3.90 ** (0.10)	-0.07 (0.04)
18-19	-3.63 ** (0.15)	-0.16 ** (0.04)
20-24	-3.78 ** (0.19)	-0.19 ** (0.03)
25-29	-3.82 ** (0.19)	-0.17 ** (0.03)
30-34	-3.75 ** (0.15)	-0.13 ** (0.02)
35+	-4.40 ** (0.09)	-0.24 ** (0.03)
		Did Estimates
Age * Mexico City interaction		Age * MC * Year 2010 interaction
14-17	-0.37 ** (0.02)	0.08 ** (0.03)
18-19	-0.11 ** (0.03)	-0.03 (0.03)
20-24	0.02 (0.04)	-0.12 ** (0.02)
25-29	0.09 ** (0.04)	-0.18 ** (0.03)
30-34	0.04 (0.02)	-0.01 (0.02)
35+	-0.18 ** (0.03)	0.29 ** (0.03)
Age * Greater Mexico City interaction		Age * GMC * Year 2010
14-17	-0.08 ** (0.02)	0.04 (0.03)
18-19	-0.06 ** (0.02)	0.07 ** (0.03)
20-24	-0.04 ** (0.01)	0.01 (0.02)
25-29	0.06 ** (0.02)	-0.08 ** (0.02)
30-34	-0.04 ** (0.02)	-0.06 ** (0.02)
35+	-0.06 ** (0.03)	0.07 ** (0.03)
Age * Ammended Metro interaction		Age * CAM * Year 2010
14-17	0.03 (0.03)	-0.10 (0.06)
18-19	-0.02 (0.03)	0.00 (0.05)
20-24	-0.02 (0.02)	-0.02 (0.04)
25-29	0.01 (0.04)	0.01 (0.04)
30-34	0.02 (0.02)	-0.13 ** (0.05)
35+	0.13 ** (0.06)	-0.09 (0.07)
Individual and metro area controls		
Secondary educ	-0.16 ** (0.02)	
Non-prof. occup.	-0.90 ** (0.02)	

	(1)	(2)
Professional	-0.76 ** (0.03)	
% secondary educ.	0.58 ** (0.15)	
% working	0.36 ** (0.19)	
Prior fertility context		
ASFR in 1990	0.14 ** (0.01)	
Dif. in ASFR (1990-2000)	0.08 ** (0.01)	
PseudoL (000s)	-464.6	
N (000s)	2,151	

** p<=.05

Table 4

Summary coefficients from DID logistic regression models predicting having a first, second, and third or higher order birth (robust standard errors in parenthesis)

	Control Metros		Mexico City		Greater MC		Const. A. Metros	
Age	**Age**	**Age * Year 2010**	**Age * MC**	**Age * Mexico City * Year**	**Age * GMC**	**Age * GMC * Year 2010**	**Age * CAM**	**Age * CAM * Year 2010**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
First child								
14-17	-4.32 ** (0.16)	-0.04 (0.04)	-0.39 ** (0.03)	0.09 ** (0.04)	-0.06 ** (0.02)	-0.01 (0.04)	0.03 (0.04)	-0.10 ** (0.05)
18-19	-4.24 ** (0.20)	-0.11 ** (0.04)	-0.12 ** (0.04)	-0.10 ** (0.03)	-0.01 (0.02)	0.02 (0.03)	0.00 (0.04)	-0.03 (0.06)
20-24	-4.81 ** (0.22)	-0.19 ** (0.04)	0.05 (0.05)	-0.14 ** (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.08 ** (0.04)	0.02 (0.05)
25-29	-5.42 ** (0.23)	-0.14 ** (0.06)	0.30 ** (0.04)	-0.24 ** (0.05)	0.00 (0.04)	-0.13 ** (0.05)	-0.13 ** (0.06)	0.08 (0.08)
30-34	-6.09 ** (0.19)	0.17 ** (0.06)	0.54 ** (0.05)	-0.12 ** (0.06)	0.18 ** (0.04)	-0.24 ** (0.05)	-0.03 (0.10)	-0.13 (0.10)
35+	-7.15 ** (0.13)	0.05 (0.10)	0.52 ** (0.06)	0.10 (0.09)	-0.13 ** (0.05)	0.18 ** (0.09)	0.08 (0.09)	-0.16 (0.13)
Second child								
14-19	-6.12 ** (0.20)	-0.40 ** (0.07)	-0.34 ** (0.05)	0.10 ** (0.06)	-0.13 ** (0.05)	0.15 ** (0.06)	0.07 ** (0.06)	-0.02 ** (0.09)
20-24	-5.84 ** (0.26)	-0.25 ** (0.05)	0.03 ** (0.06)	-0.20 ** (0.04)	0.02 ** (0.03)	-0.04 ** (0.04)	0.03 ** (0.03)	-0.02 ** (0.06)
25-29	-5.92 ** (0.26)	-0.22 ** (0.04)	0.18 ** (0.06)	-0.26 ** (0.04)	0.14 ** (0.04)	-0.13 ** (0.04)	-0.08 ** (0.08)	0.03 ** (0.05)
30-34	-5.98 ** (0.22)	-0.07 ** (0.04)	0.28 ** (0.06)	-0.13 ** (0.03)	0.08 ** (0.04)	-0.21 ** (0.03)	-0.14 ** (0.09)	-0.02 ** (0.10)
35+	-7.04 ** (0.17)	0.17 ** (0.07)	0.50 ** (0.06)	-0.08 ** (0.06)	0.18 ** (0.05)	-0.21 ** (0.07)	-0.02 ** (0.10)	-0.10 ** (0.12)
Third or more children								
14-24	-6.03 ** (0.25)	-0.29 ** (0.07)	-0.09 (0.07)	0.17 ** (0.05)	-0.17 ** (0.05)	0.15 ** (0.05)	0.04 (0.08)	-0.04 (0.09)
25-29	-5.28 ** (0.26)	-0.20 ** (0.04)	0.03 (0.07)	-0.02 (0.03)	0.14 ** (0.05)	0.01 (0.03)	0.12 (0.09)	-0.01 (0.06)
30-34	-4.53 ** (0.24)	-0.23 ** (0.04)	-0.11 ** (0.05)	-0.03 (0.03)	-0.09 ** (0.04)	0.05 (0.03)	0.05 (0.04)	-0.18 ** (0.09)
35+	-4.58 ** (0.19)	-0.37 ** (0.06)	-0.41 ** (0.05)	0.34 ** (0.04)	-0.12 ** (0.03)	0.13 ** (0.04)	0.10 (0.06)	-0.04 (0.09)

** p<=.05