



LUND UNIVERSITY  
School of Economics and Management

# The Impact of Abortion Reforms on Female Labour Force Participation and Education in Mexico

by

Linda Nihlwing

June 2019

Master's Programme in Economics

Supervisors: Kaveh Majlesi and Hanna Mühlrad



# Abstract

This study examines the effects of progressive and regressive abortion reforms on women's educational and labour market outcomes in Mexico. First trimester abortions became legal in Mexico City in 2007. Following the progressive legislative reform, 18 other Mexican states implemented more restrictive legislation on abortions. By using quarterly survey data and a difference-in-differences approach, I find a significant positive correlation between female labour force participation and abortion legalisation. Nevertheless, insufficient support of the parallel trend assumption prohibits an analysis of the causal impact. The regressive reforms do not appear to have had any statistically significant impact on female labour supply at conventional levels, although they appear to have had a positive causal impact on the share of young women who complete high school. Based on the results in this study, I find indications that abortion reforms are correlated with some effects on educational and labour market outcomes. However, more research is needed to clarify through what mechanisms abortion access and legal status affect women's schooling and job opportunities and to further establish a causal relationship.

Keywords: Labour Force Participation, Education, Abortion Laws, Reproductive Health, Difference-in-Differences

# Acknowledgements

I want to thank Lisa and Sofie for the ideas and inspiration to this study. Thank you also to my supervisors Hanna and Kaveh for useful help and feedback throughout the thesis process, and to Charlotta and Devon for valuable help with data and coding issues. Anna, Nathalie, Mia and Thea, you have made the writing of this thesis a whole lot more fun than it otherwise would have been! Finally, thank you to all my classmates for these past two years, it would not have been the same without you!

# Table of Contents

<b>1</b>	<b>Introduction</b> .....	<b>1</b>
<b>2</b>	<b>Background</b> .....	<b>5</b>
2.1	Abortion Access and Abortion Laws .....	5
2.2	Institutional Setting – The ILE Reform and the Regressive Legislative Changes .....	6
2.3	Fertility, Abortion Legalisation and Labour Force Participation .....	7
2.4	Abortions and School Attendance .....	9
<b>3</b>	<b>Data</b> .....	<b>11</b>
<b>4</b>	<b>Empirical Strategy</b> .....	<b>17</b>
4.1	Validity .....	19
<b>5</b>	<b>Results</b> .....	<b>21</b>
5.1	Labour Market Outcomes .....	21
5.1.1	Robustness Tests .....	26
5.1.2	Placebo Tests .....	27
5.2	Educational Outcomes .....	28
5.2.1	Placebo Tests .....	30
<b>6</b>	<b>Discussion and Conclusion</b> .....	<b>32</b>
	<b>References</b> .....	<b>36</b>
	<b>Appendix</b> .....	<b>41</b>

# List of Tables

Table 1: Summary Statistics of the Sample (women aged 15-44 years).....	13
Table 2: Summary Statistics, Educational Characteristics (women aged 18-25 years) .....	14
Table 3: Difference-in-Differences Estimates of Legal Reforms on Labour Supply (Extensive Margin) .....	21
Table 4: Difference-in-Differences Estimates of Legal Reforms on Hours Worked Per Week .....	23
Table 5: Difference-in-Difference Estimates of Legal Reforms on Labour Supply – Heterogeneous Effects .....	25
Table 6: Difference-in-Difference Estimates of Legal Reforms on Hours Worked Per Week – Heterogeneous Effects .....	26
Table 7: Difference-in-Differences Estimates of Legal Reforms on High School Completion .....	28
Table 8: Difference-in-Differences Estimates of Legal Reforms on Years of Schooling .....	29

## Tables in the Appendix

Table A 1: Regressive legislative changes after the ILE reform in Mexico City .....	41
Table A 2: Difference-in-Differences Estimates of Legal Reforms on Labour Force Participation, Heterogeneous Effects, No Control for Spill-over Effects .....	42
Table A 3: Difference-in-Differences Estimates of Legal Reforms on Hours Worked Per Week, Heterogeneous Effects, No Control for Spill-over Effects. ....	42
Table A 4: Difference-in-Differences Estimates of Legal Reforms on the Extensive Margin of Labour Supply, Only Urban Areas with >100 000 Inhabitants. ....	43
Table A 5: Difference-in-Differences Estimates of Legal Reforms on the Extensive Margin of Labour Supply, Only Urban Areas with >15 000 Inhabitants. ....	43
Table A 6: Difference-in-Differences Estimates of Legal Reforms on the Intensive Margin of Labour Supply, Only Urban Areas with >100 000 Inhabitants. ....	44

Table A 7: Difference-in-Differences Estimates of Legal Reforms on the Intensive Margin of Labour Supply, Only Urban Areas with >15 000 Inhabitants. ....	44
Table A 8: Difference-in-Differences Estimates of Legal Reforms on the Extensive Margin of Male Labour Supply. ....	45
Table A 9: Difference-in-Differences Estimates of Legal Reforms on the Intensive Margin of Male Labour Supply. ....	45
Table A 10: Robustness Test - Difference-in-Differences Estimates of Legal Reforms on the Extensive Margin of Labour Supply for Women Aged 45-65 Years.....	46
Table A 11: Robustness Test - Difference-in-Differences Estimates of Legal Reforms on the Intensive Margin of Labour Supply for Women Aged 45-65 Years.....	46
Table A 12: Robustness Test - Difference-in-Differences Estimates of Legal Reforms on the Completion of High School for Young Men Aged 18-25 Years. ....	47
Table A 13: Robustness Test - Difference-in-Differences Estimates of Legal Reforms on Years of Schooling for Young Men Aged 18-25 Years. ....	47
Table A 14: Robustness Test - Difference-in-Differences Estimates of Legal Reforms on the Completion of High School for Older Women Aged 45-65 Years.....	48
Table A 15: Robustness Test - Difference-in-Differences Estimates of Legal Reforms on Years of Schooling for Older Women Aged 45-65 Years.....	48

# List of Figures

Figure 1: Trends in Labour Supply (Extensive Margin), by the Different Types of States .....	15
Figure 2: Trends in Labour Supply (Intensive Margin), by the Different Types of States .....	15
Figure 3: Trends in Average Years of Schooling, by the Different Types of States .....	16
Figure 4: Trends in Share of Women Who Complete High School, by the Different Types of States.....	16
Figure 5: Event Studies for Labour Supply (Extensive Margin) .....	22
Figure 6: Event Studies for Hours Worked Per Week (Intensive Margin).....	24
Figure 7: Event Studies for High School Completion.....	29
Figure 8: Event Studies for Years of Schooling.....	30

# 1 Introduction

In Latin America and the Caribbean, women have very limited access to safe abortion services. In fact, more than 97 per cent of women in this region in reproductive ages live in countries where abortions are restricted to different degrees. At the same time, the region experiences the highest rate of unintended pregnancies and the highest regional rate of unsafe abortions in the world (WHO, 2012; Guttmacher Institute, 2018). The United Nations acknowledge that the demand for family planning is increasing rapidly in many parts of the world. Improved access to family planning methods is a pronounced goal of the 2030 Agenda for Sustainable Development (United Nations, 2019).

Access to abortions has been shown to result in reductions in fertility rates. Hence, legalising abortions makes it possible for women to safely prevent childbearing and/or control the timing of childbearing, with possible impacts on women's labour market and marriage market options (e.g. Angrist & Evans, 1999; Klerman, 1999; Levine et al., 1999; Guldi, 2008; Pop-Eleches, 2010; Mølland, 2016; Clarke & Mühlrad, 2018). Reductions in fertility may also result in an increased share of women that can participate in paid labour instead of caring for children at home (Canning & Schultz, 2012). The proportion of female participants in the labour force in Latin America has increased steadily since the early 1980s, nevertheless, the region still experiences lower participation rates for women than other OECD countries (Campos-Vazquez & Velez-Grajales, 2014). Furthermore, the returns to schooling and human capital investments will increase as fertility rates decrease, since women can expect a longer payoff time-period when being able to stay on the labour market without unexpected interruptions (Angrist & Evans, 1999; Kalist, 2004; Mølland, 2016). As women can participate in the labour force to a greater extent, the working-age to total population ratio increases which in the long run may result in higher incomes per capita (Bloom et al., 2009).

In this study, I examine how educational and labour market outcomes were affected by progressive as well as regressive legislative changes in abortion laws in Mexico in 2007-2009 (Mondragón y Kalb et al., 2011; Juárez et al., 2013). The unique policy environment of Mexican abortion laws makes it possible to study simultaneous expansions and contractions in abortion

availability across the country. It is relevant to examine what effects these policy changes could have on outcomes that are of importance to individual women as well as to the country's development path. Previous research on abortions and birth control technologies have largely focused on either maternal health or fertility, or outcomes of affected children (e.g. Angrist & Evans, 1999; Levine et al., 1999; Clarke & Mühlrad, 2018). There is only a small number of studies that have explored the connection between abortion legalisation and female labour supply (Angrist & Evans, 1999; Kalist, 2004; Mølland, 2016; González et al., 2018). However, these studies have been concentrated on high-income countries, such as the U.S., Norway, or Spain. Contractions in abortion laws have gained even less attention in previous studies (e.g. Pop-Eleches, 2010; Fischer, Royer & White, 2017; Cunningham et al., 2018), and there is no study that assesses the effect of a regressive change on labour market outcomes for affected mothers. There is, to the best of my knowledge, no study yet that has estimated the impact of progressive and regressive abortion law changes on labour supply in a middle-income country. This study thus fills a gap in the existing literature by combining variation in exposure to progressive and regressive abortion reforms across states and time with individual-level data to examine the effects of abortion reforms in an upper middle-income country like Mexico.

The topic of this study is of relevance for Mexican policymakers as well as policymakers in other countries. Abortion legislation is under constant scrutiny. Even though many countries have expanded their legislation in the past two decades, there is at the same time an increasing number of restrictions implemented that infringe on legal and safe abortions in countries with predominantly liberal abortion laws, such as the U.S. (Singh et al., 2018). The near-total ban on abortions in the American state of Alabama is the latest example of restrictive abortion laws. The new law was passed in May 2019 and states that abortions will not be legal even if the pregnancy is a result of rape or incest (The Guardian, 2019). Since abortion access has been shown to have direct impacts on fertility, mortality and morbidity, it is also motivated to examine what indirect effects abortion legalisation and suppression could have on outcomes in the labour market and education.

Mexico consists of 31 federal states and the Federal District of Mexico (also known as Mexico DF or Mexico City). The legislative power is divided between the national constitution and the state constitutions. Abortion laws are legislated on a state level and abortions have been illegal in all 32 federal entities of Mexico until 2007. In that year, safe and freely accessible first trimester abortions were made legal in Mexico City in a reform known by the Spanish acronym

ILE, *interrupciones legales del embarazo* (Juarez et al., 2013). In the six years preceding the reform, only 62 legal abortions were performed in Mexico City. After the parliament of the federal district passed the ILE reform, the Ministry of Health immediately rolled out a program that provided abortions free of charge in public clinics. During the five-year period following the passing of the reform, 89 510 abortions were performed in public clinics in the capital. Abortions were also made legal in the private health-care sector, although, there is no official record of the number of abortions performed in private clinics. This means that the actual number of abortions is most likely of an even larger magnitude. The sharp increase in the number of observed abortions consequently indicates there was a large unmet demand for abortion services prior to the ILE reform (Becker & Olavarrieta, 2013; Schiavon et al., 2010). As a response to the ILE reform in Mexico City, 18 other states imposed stricter jurisdictions that limited abortion rights (Mondragón y Kalb et al., 2011). The ILE reform in Mexico City and the following regressive law changes are unique since they provide an opportunity to evaluate the impacts of a complex differing policy environment within a country.

Under the ILE reform, abortions also became legal for girls under the age of 18, although parental consent is still required (Mondragón y Kalb, 2011). Teenage childbearing is of particular interest as children born to teenagers are doing worse than children born to adults. It has also been shown to often have adverse effects on the teen mother. Whether this link is causal or not remains debated. There is so far mixed evidence on the effect adolescent childbearing has on school attendance. It has been argued that teen births are not an exogenous determinant of schooling and that it is rather the socioeconomic background of the mother that affects schooling (Ribar, 1994). Others have shown that women who give birth in their teens do not complete high school as planned (e.g. Mooney Marini, 1984; Mott & Marsiglio, 1985; Hoffman, 2008). The presence of a child can complicate the completion of school, and it has been shown that teen mothers are likely to be less successful in the labour market due to less education and that women who delay childbearing on average earn more due to more hours worked (Hoffman, 2008). Abortions may thus be used as a tool to delay childbearing and enable a completed education. I will, therefore, also examine whether the ILE reform had any impact on the affected cohorts' educational outcomes.

To capture the causal impact of abortion laws on female labour supply and school attendance, I take advantage of the dual-policy environment with both expansions and contractions in policies across different states and time. To estimate the causal effects, I use a difference-in-

differences approach in which outcomes are compared between treated and untreated areas, before and after the law changes. I further implement event studies of the reform effects and placebo tests to assess the validity of the methodological strategy. Data from the Mexican National Survey of Occupation and Employment (ENOE) is used, and it includes quarterly observations from 2005 to 2018. More than 120 000 dwellings and approximately 400 000 individuals from all states are interviewed for the survey, and the selection of the sample makes the survey representative for the whole Mexican population (INEGI, 2018).

Overall, I find ambiguous impacts of the ILE reform on labour market outcomes. I find a positive correlation between abortion legalisation and labour force participation. However, I do not find sufficient support for the parallel trend assumption, which consequently prohibits a more profound analysis of the causal relationship. The regressive reforms do not appear to have had any statistically significant impact on female labour supply at conventional levels. I observe a positive correlation between abortion legalisation and years of schooling, although point estimates suggest that there is no sign of a parallel trend in outcomes in the pre-reform time-periods, hence I cannot regard these results to represent a causal relationship. The results indicate that the regressive law changes appear to have had a positive causal impact on the share of young women who complete high school.

The paper is structured as follows: in Section 2, I present previous literature and institutional background. In Section 3, I describe the data that is used and in Section 4, I describe and discuss the empirical approach. In Section 5, I present the results and in the final section, I analyse my findings and conclude the study.

## 2 Background

### 2.1 Abortion Access and Abortion Laws

Previous studies suggest that abortions occur at approximately the same rate in countries with restrictive laws as in countries where abortions are allowed without restriction, which consequently results in a huge number of illegal and unsafe abortions every year (Juarez et al., 2013; Singh et al., 2018). Latin America and the Caribbean experience the highest abortion rates in the world, and since abortion is illegal in most of the countries in the regions, a majority of the abortions are performed under unsafe circumstances (WHO, 2012).

Over the past two decades, the average family size in Mexico has declined from approximately six children to just over two children, which is close to the replacement rate. The reduction in fertility rates can to a certain degree be explained by the widespread use of contraceptives. Women in urban and more developed areas usually aim for smaller families as opposed to women in rural and less-developed areas. This is reflected in estimations of abortion rates, where the abortion rate in Mexico's most economically developed region is twice as high as compared to the least developed regions in the country (Juarez et al., 2013).

Family planning services and provision of contraceptives have been freely available in Mexico since the passing of the General Population Law in 1974. In 1995, health care expenditure was decentralised to state levels. State governments are also responsible for legislation concerning abortions, hence legislation has differed between states. Up until 2007, abortions were illegal in all states in Mexico, except for in case of rape. In some states, abortions were also legal when the woman's life was at risk or if the foetus suffered from severe malformations. In reality however, abortions in such cases were difficult to access due to established social stigma and a lack of sufficient administration. It has been estimated that 55 per cent of all the pregnancies in Mexico every year are unintended. Consequently, a majority of the abortions performed nationally before 2007 were performed illegally (Juarez et al., 2013).

It has previously been shown that as abortions become more difficult to access, it has a considerable impact on abortion rates. A regressive legislative change was executed in Romania in 1966, following a decade of liberal abortion laws. As abortions and other contraceptives were banned, it resulted in a 25 per cent increase in life cycle fertility. When the ban was lifted in 1989, it resulted in a distinctive short-run reduction in fertility rates by 30 per cent. These findings further highlight the substantial impact that legal and accessible abortions have on fertility rates (Pop-Eleches, 2010). Reductions in funding led to increased restrictions on family planning clinics in Texas, which resulted in a significant decrease in the number of clinics. Consequently, the number of abortions fell by more than 20 per cent in three years and the number of births increased (Fischer, Royer & White, 2017; Cunningham et al., 2018). So far, there has been no measurable impacts on fertility following the regressive abortion law changes in Mexico (Clarke & Mühlrad, 2018).

It is impossible to estimate the exact numbers of abortions performed in Mexico since there are no official records of illegal, secret abortions. Estimations show that abortion rates increased from 25 abortions per 1000 women in 1990 to 33 abortions per 1000 women in 2006. When abortions are legally prohibited, women must instead turn to illegal and often unsafe options. In 2006, there was an estimated number of 875 000 induced abortions, resulting in an estimated 150 000 women being treated for complications from induced abortions in public hospitals (Juarez et al., 2013). Furthermore, it has been estimated that 7.2 per cent of all maternal deaths in Mexico between 1990 and 2008 could be related to risky abortions (Becker & Olavarrieta, 2013). Access to safe abortions is regarded as a fundamental measure to ensure improvements in maternal health and reduce mortality and morbidity rates (Grimes et al., 2006). Clarke and Mühlrad (2018) estimate that the ILE reform resulted in a large reduction in maternal morbidity related to haemorrhage. Moreover, maternal mortality rates were found to drop sharply because of the legalisation of abortions (Clarke & Mühlrad, 2016).

## 2.2 Institutional Setting – The ILE Reform and the Regressive Legislative Changes

In April 2007, the state parliament of the Federal District of Mexico legalised abortions with the purpose of putting an end to the vast number of unsafe abortions (Mondragón y Kalb et al., 2011; Becker & Olavarrieta, 2013). Mexico is classified as an upper middle-income country;

yet, poverty and income inequality are still highly present, and Mexico has the second highest Gini coefficient among all OECD countries (Langer, Sanhueza & Senderowicz, 2018). The ILE reform in Mexico City meant that abortions are provided free of charge to residents of Mexico City. Abortion services are not restricted to only residents of Mexico City, but available to everyone who requests them. However, women from outside the federal district must pay a fee based on a sliding scale depending on income and socioeconomic status. Statistics show that 26.8 per cent of the women obtaining abortions are from outside the federal district, where a majority of the clients come from the state of Mexico, which neighbours to Mexico City. Girls under 18 are allowed to have abortions, but consent from a parent or a guardian is required (Mondragón y Kalb et al., 2011; Becker & Olavarrieta, 2013).

Shortly after the ILE reform, 18 states imposed stricter legal jurisdiction on abortions to prevent progressive changes such as in Mexico City. Constitutional changes were then added to ensure the life of the foetus from conception (Juarez et al., 2013). States and dates of legislation alteration are presented in Table A1 in the Appendix.

## 2.3 Fertility, Abortion Legalisation and Labour Force Participation

Previous research on the effects of abortion legalisation has mainly been concentrated on two strands of literature, where the first strand focuses on the effect of abortions on fertility and maternal mortality and morbidity (e.g. Clarke & Mühlrad, 2018; González et al., 2018). The second strand of literature has largely been focused on the cohorts of children exposed to abortion reforms (e.g. Donohue & Levitt, 2001; Pop-Eleches, 2010). There has not yet been a large number of studies on the impact of legal and accessible abortions on labour market dynamics.

The few numbers of studies that examine labour market effects have largely been focused on high-income countries (Angrist & Evans, 1999; Kalist, 2004; Oreffice, 2007; Mølland, 2016; González et al., 2018). There is mixed evidence on what effect legal and accessible abortions could have on female labour force participation. The legalisation of abortions is assumed to affect female labour supply through a reduction in unwanted pregnancies, resulting in lowered

fertility. Reduced fertility allows women to be a part of the labour force to a greater extent (Kalist, 2004; Canning & Schultz, 2012).

Kalist (2004) uses American population survey data to estimate the impact on labour force participation following the liberalisation of state abortion laws in the US after the Supreme Court case of *Roe v. Wade*. The Supreme Court ruled that there is a constitutional right to privacy, which hence protects women's liberty to choose whether they want an abortion or not. The results of the study show an increase in the probability of participating in the labour force among women in states where abortions were legalised prior to *Roe v. Wade*. Furthermore, there was a stronger effect among black women than white women. Angrist and Evans (1999) use state-level differences in abortion legislation in the U.S. as instrumental variables for exogenous variation in fertility and examine the effect on teenage fertility and teen marriages. They investigate whether the first-stage effects had any further impact on schooling and labour market outcomes. Similar to Kalist's findings, the effect on white women is close to zero. Black women, on the other hand, experienced significant large positive effects on labour market outcomes and high school graduation rates. Mølland (2016) shows that access to legal abortions results in higher labour market attachments for Norwegian women following a progressive abortion access reform in Oslo in the late 1960s and early 1970s. In contrast, González et al. (2018) find that women achieved better educational outcomes and higher life satisfaction, but the reform had no significant impact on the probability of having a job after abortions were legalised in Spain in 1985. Oreffice (2007) finds that women's labour supply decreased following abortion legalisation in the U.S. after *Roe v. Wade*, whilst their husbands increased their labour supply. Her results are in line with the bargaining hypothesis, arguing that women's bargaining power within the household increases as a result of abortion legalisation thus allowing them to reduce their annual hours worked.

While there is limited research on the causal relationship between legalised abortions and labour supply, there is an extensive field of research on the link between fertility and female labour supply. Many of the studies show that there is a negative relationship between fertility and women's labour force participation. The potential problems of endogeneity in fertility variables have often been handled with IV strategies, using, for example, twin births, the gender of the first child or IVF treatment as instruments (Angrist & Evans, 1998; Lundborg, Plug, Rasmussen, 2017; Aaronson et al., 2018). Access to contraceptives allows women to delay their childbearing, and it has been shown to have positive impacts on the female labour force

participation. Birth control pills consequently lower the cost of education and career investments by avoiding breaks from unintended pregnancies (Goldin & Katz, 2002).

## 2.4 Abortions and School Attendance

Available data on abortion clients between 2007 and 2010, following the ILE reform, show that an average of five per cent of the clients were minors below the age of 18 years. However, the rate of minors obtaining abortions was halved during the time-period, starting at six per cent in 2007 and going down to only three per cent in 2010 (Mondragón y Kalb, 2011). Schooling is only mandatory until the age of 15 in Mexico (OECD, 2013). High school is not compulsory, and in 2014 only 53 per cent of 15-19-year-olds were enrolled in high school/upper secondary school. This number is lower than the OECD average of 84 per cent (OECD, 2014).

Previous research has shown that abortion legalisation leads to reductions in teen fertility (Angrist & Evans, 1999; Levine et al., 1999; Guldi, 2008). Evidence on the effect of adolescent childbearing on school attendance has so far been inconclusive. Some studies have found that there is no significant difference in educational outcomes for teens who get pregnant and for teens who do not (Ribar, 1994; Hotz, McElroy & Sanders, 2005). In contrast, there is a large number of studies showing negative impacts on schooling from adolescent pregnancies, where girls have a lower probability of receiving a high school diploma or reduce the average years of schooling (e.g. Mooney Marini, 1984; Mott & Marsiglio, 1985; Hoffman, 2008; Fletcher & Wolfe, 2009; Kane et al., 2014).

There is limited research on how legal and accessible abortions impact teenagers' schooling. Several studies have found positive educational outcomes for the affected child cohorts following abortion reforms (e.g. Pop-Eleches, 2006; Mølland, 2016). Less focus is turned towards the educational outcomes of the teen mother. González et al. (2018) find that abortion legalisation in Spain resulted in positive educational outcomes, where fewer students dropped out of high school after the reform. Similarly, Guldi (2008) finds that following abortion legalisation in the U.S. in the 1970s, lowered costs of abortions and better access resulted in increased rates of college graduation. Following abortion legalisation in Oslo, Mølland (2016) finds positive effects on the completion of a college degree. A large group of scholars argues that reducing teen fertility could be beneficial to adolescents' educational outcomes (e.g.

Mooney Marini, 1984; Mott & Marsiglio, 1985; Hoffman, 2008; Fletcher & Wolfe, 2009; Kane et al., 2014), and abortion legalisation has been suggested as an appropriate measure to facilitate this (Guldi, 2008; Mølland, 2016; González et al., 2018).

### 3 Data

To estimate the effect of progressive and regressive abortion reforms on female labour supply and educational outcomes in Mexico, I utilise data from the longitudinal Mexican National Survey of Occupation and Employment (ENOE). Data on labour force participation comes from a survey, performed quarterly since 2005 by the National Institute for Statistics and Geography (INEGI). The primary sampling unit is residential buildings/dwellings, where a number of different households is included. Every person in households above 15 years is asked about labour supply and sociodemographic characteristics. The data set covers more than 120 000 dwellings and approximately 400 000 individual observations from all 31 Mexican states and the federal district of Mexico City. An expansion factor is included in the data set and functions as a sample weight, based on the respondent's representativeness of the population. It takes the socioeconomic stratum and place of residence into account and assigns each individual a number that indicates how many people in the total population that can be represented by this specific individual (INEGI, 2018). It is not optimal that the time span of the data set only covers two years of the pre-reform period. The small number of observations before the implementation of the ILE reform complicates an in-depth examination of pre-treatment trends.

Households in the survey are exchanged on a rotating basis after five quarters (INEGI, 2018). I will hence use the data as repeated cross-sectional data. However, the averages for each state will resemble a panel data structure and allow for an analysis of differences across states. The rotational design does not allow me to track individuals over longer time periods and estimate how individuals were affected by the reform over time. Repeated cross-sectional data are less likely to be subject to attrition and nonresponse bias. Surveys utilising repeated cross-sectional panels instead of panel data are also more often covering a larger number of individuals and longer time periods (Verbeek, 2008).

This study focuses on women between the ages of 15 and 44 years since this age group is considered to capture women's fertile ages (Kalist, 2004; Clarke & Mühlrad, 2018). I presume that the abortion reforms will primarily have an impact on fertile women since their reproductive health options are directly affected by the access to safe and legal abortions.

Labour force participation can be measured on the extensive as well as the intensive margin. The extensive margin measures the share of people that participates in the labour force and the employment choices. The intensive margin, on the other hand, refers to choices on the number of working hours once you are already in the labour force (Heckman, 1993). Both types of dependent variables are available in the ENOE survey. The labour force is defined as people who are economically active, either employed, or actively searching for jobs. The intensive margin is defined as the number of hours worked per week. This variable is pre-coded by INEGI and conditioned on that the respondent is already part of the labour force (INEGI, 2018).

Nine years of schooling or less correspond to elementary or middle school in Mexico, which is compulsory to all pupils. 10-12 years of education are equal to high school education, which is not mandatory (Mondragón y Kalb, 2011). The effect on schooling outcomes is measured through years of schooling and the change in the proportion of people that completes high school, which is similar to the approach of Mølland (2016).

The summary statistics in Table 1 describe the main variables used in the analysis in 2007, which is the year of the ILE reform. The means and standard deviations are calculated for Mexico as a whole, Mexico City, the regressive states, other states and urban areas with more than 100 00 inhabitants. The list of affected regressive states is based on research by Clarke and Mühlrad (2018), and a more detailed description is found in Table A1 in the Appendix.

Table 1: Summary Statistics of the Sample (women aged 15-44 years)

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Mexico	Mexico City	Regressive States	Urban Areas ≥ Population 100 000	Other States
	Mean (sd)	Mean (sd)	Mean (sd)	Mean (sd)	Mean (sd)
<i>Population by age groups</i>					
Share of women aged 15-19 years	0.206 (0.404)	0.160 (0.367)	0.207 (0.405)	0.197 (0.397)	0.207 (0.405)
Share of women aged 20-24 years	0.184 (0.387)	0.174 (0.379)	0.184 (0.388)	0.187 (0.390)	0.184 (0.387)
Share of women aged 25-29 years	0.159 (0.365)	0.169 (0.375)	0.159 (0.365)	0.157 (0.364)	0.158 (0.365)
Share of women aged 30-34 years	0.158 (0.365)	0.174 (0.379)	0.156 (0.363)	0.156 (0.363)	0.158 (0.364)
Share of women aged 35-39 years	0.153 (0.360)	0.170 (0.375)	0.152 (0.359)	0.156 (0.363)	0.152 (0.359)
Share of women aged 40-44 years	0.141 (0.348)	0.154 (0.361)	0.142 (0.349)	0.147 (0.354)	0.141 (0.348)
<i>Labour market characteristics</i>					
In the labour force	0.465 (0.499)	0.508 (0.500)	0.473 (0.499)	0.505 (0.500)	0.463 (0.499)
Hours worked last week	17.16 (22.00)	19.03 (22.09)	17.59 (22.14)	18.99 (22.29)	17.11 (22.00)
<i>State-level controls</i>					
State unemployment rate	0.0232 (0.151)	0.0438 (0.205)	0.0209 (0.143)	0.0273 (0.163)	0.0227 (0.149)
State poverty rate	0.181 (0.0717)	0.117 (0.00698)	0.185 (0.0751)	0.170 (0.0691)	0.182 (0.0719)
Observations	411,920	10,328	235,443	252,387	401,652

Notes: The data comes from the Mexican National Survey of Occupation and Employment (ENOE) and is based on quarterly sample collections. Mexico consists of 32 states. Values are only displayed for the year 2007, the year of the ILE reform and only women aged 15-44 years are included in the sample. In Column 1, the means and standard deviations of all variables are displayed for Mexico as a country. In Column 2, means and standard deviations are shown only for residents of Mexico City. Column 3 displays the means and standard deviations for the 18 states that implemented regressive law changes. Column 4 shows the means and standard deviations for urban areas with more than 100 000 inhabitants. In Column 5, I show the means and standard deviations for all variables in the 13 states that did not impose any legislative changes.

The summary statistics show that observable characteristics are relatively uniform across the different groups of states. Nevertheless, women in Mexico City are slightly older. The federal district also has an unemployment rate which is double in size compared to the other groups and a poverty rate which is substantially lower than other regions of the country. Apart from these differences, Mexico City shares most characteristics with other heavily urbanised areas across the country. Regressive states and the other states that did not impose any legislative changes are nearly identical in all observable characteristics.

Summary statistics for educational outcomes are displayed in Table 2 for the sample of women aged 18-25 years in 2007. Young women in Mexico City and other heavily urbanised areas obtain more years of schooling than women in regressive states and other non-treated states. Moreover, there is a larger share of young women who had completed at least a high school degree in Mexico City than in other parts of the country.

*Table 2: Summary Statistics, Educational Characteristics (women aged 18-25 years)*

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Mexico	Mexico City	Regressive States	Urban Areas $\geq$ Population 100 000	Other States
	Mean (sd)	Mean (sd)	Mean (sd)	Mean (sd)	Mean (sd)
<i>Educational characteristics</i>					
Years of schooling	10.55 (3.480)	11.27 (3.030)	10.39 (3.533)	11.28 (3.241)	10.54 (3.488)
Completed high school	0.294 (0.456)	0.365 (0.482)	0.296 (0.457)	0.319 (0.466)	0.292 (0.455)
Observations	122,015	2,802	70,103	75,394	119,213

Notes: The data comes from the Mexican National Survey of Occupation and Employment (ENOE) and is based on quarterly sample collections. Mexico consists of 32 states. Values are only displayed for the year 2007, the year of the ILE reform and only women aged 18-25 years are included in the sample. In Column 1, the means and standard deviations of all variables are displayed for Mexico as a country. In Column 2, means and standard deviations are shown only for residents of Mexico City. Column 3 displays the means and standard deviations for the 18 states that implemented regressive law changes. Column 4 shows the means and standard deviations for urban areas with more than 100 000 inhabitants. In Column 5, I show the means and standard deviations for all variables in the 13 states that did not impose any legislative changes.

Trend lines in Figures 1-4 show how the outcome variables (labour supply, hours worked per week, high school completion and years of schooling) have developed over time in Mexico City, the regressive states and the rest of the country. The red vertical line represents the year 2007, the year of the ILE reform. It is shown in Figure 1, that the share of women in the labour force in Mexico City and the rest of the country follow fairly similar trends, although the trend line for the capital is more volatile. The trendline of hours worked per week in Figure 2 yields similar results. The women in the Mexico City follow similar trends as compared to the regressive states and other states, albeit more volatile. Figure 3 shows that trends in average years of schooling follow similar paths in Mexico City, regressive states as well as in the remaining states. Finally, Figure 4 reveals that the share of women who complete high school follow roughly similar trends in both groups. Generally, there appears to be a similarity in trends for educational and labour market outcome variables across the different treatment groups and

the control group. However, the observations from Mexico City are more volatile in all figures. It could depend on the smaller number of observations and less geographical variation. Due to limitations in data availability, it is not possible to track similarities or differences in trends further back in time.

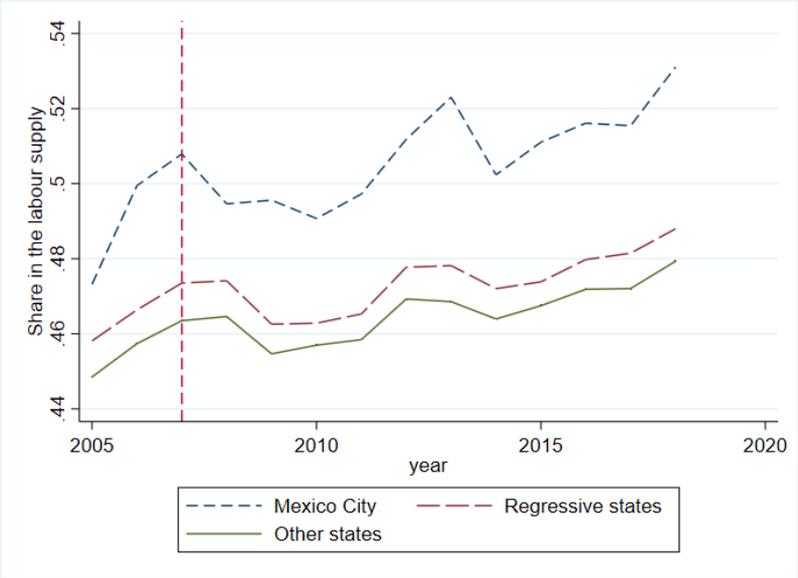


Figure 1: Trends in Labour Supply (Extensive Margin), by the Different Types of States

Notes: Trend lines are plotted for yearly averages of the share of women in the labour force. The sample includes women between the ages of 15-44 years for the period 2005-2018. Trends are plotted for Mexico City, regressive states and states that did not implement any abortion reforms. The red vertical line represents 2007, the year of the ILE reform. The data come from ENOE.

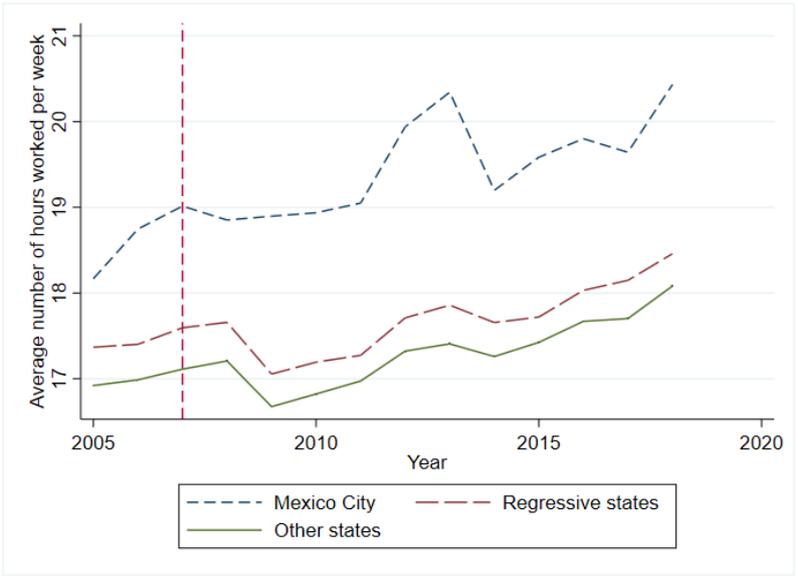


Figure 2: Trends in Labour Supply (Intensive Margin), by the Different Types of States

Notes: Trend lines are plotted for yearly averages of the number of hours worked per week. The sample includes women between the ages of 15-44 years for the period 2005-2018. Trends are plotted for Mexico City, regressive

states and states that did not implement any abortion reforms. The red vertical line represents 2007, the year of the ILE reform. The data come from ENOE.

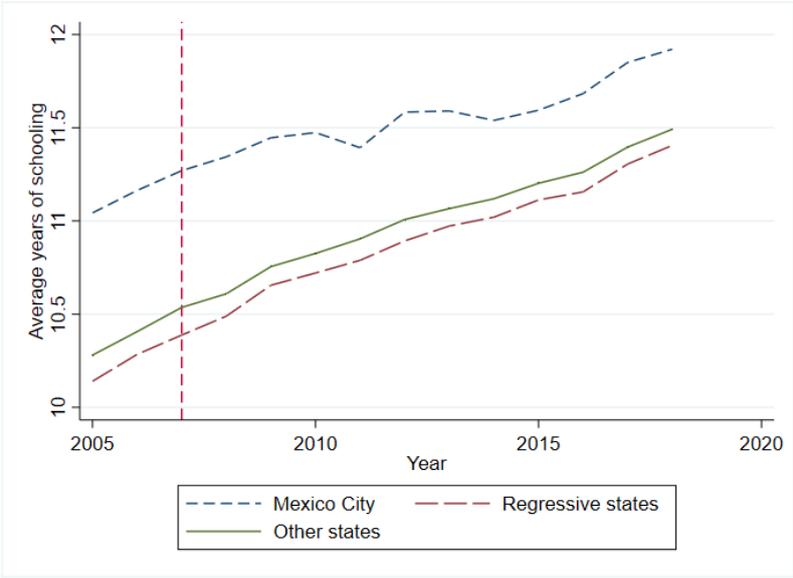


Figure 3: Trends in Average Years of Schooling, by the Different Types of States

Notes: Trend lines are plotted for yearly averages of years of schooling. The sample includes women between the ages of 18-25 years for the period 2005-2018. Trends are plotted for Mexico City, regressive states and states that did not implement any abortion reforms. The red vertical line represents 2007, the year of the ILE reform. The data come from ENOE.

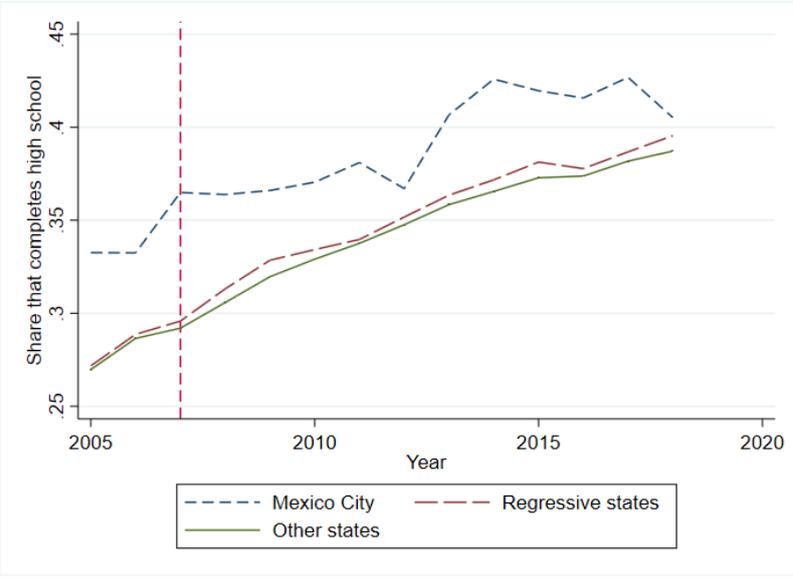


Figure 4: Trends in Share of Women Who Complete High School, by the Different Types of States

Notes: Trend lines are plotted for yearly averages of the share of women who completes high school. The sample includes women between the ages of 18-25 years for the period 2005-2018. Trends are plotted for Mexico City, regressive states and states that did not implement any abortion reforms. The red vertical line represents 2007, the year of the ILE reform. The data come from ENOE.

## 4 Empirical Strategy

Since abortion reforms are not necessarily random, I use a difference-in-differences approach to estimate the causal effects as randomised treatment is then not required. A difference-in-differences strategy compares the difference in outcomes of treated and untreated states, before and after the abortion reforms. Only women in Mexico City had access to legal abortions after 2007. Therefore, I can compare the different educational and labour market outcomes for the treated individuals prior to and after the ILE reform to the equivalent difference of untreated individuals. Women in states with regressive legal changes had less access to safe and legal abortions after the reforms, and I can consequently apply the same method to examine their difference in educational and labour market outcomes. A difference-in-differences approach enables an isolation of the treatment effect and a differencing out of national trends that could otherwise bias the estimates. In addition, the treatment and control states are allowed to differ in constant characteristics, as the differences are captured by state fixed effects.

In my baseline model, I estimate the following difference-in-differences equation:

$$Outcome_{st} = \beta_0 + \beta_1 Post\ ILE_{st} + \beta_2 Regressive\ Law\ Changes_{st} + X'_{st} + Age_{ist} + \theta_s + \gamma_t + \varepsilon_{st} \quad (1)$$

The dependent variable refers to educational and labour market outcomes in state  $s$  at time  $t$ . *PostILE* refers to the post-ILE changes for exposed individuals in Mexico City. *Regressive Law Changes* refers to changes post the regressive law changes in exposed states<sup>1</sup>. The main parameters of interest are  $\beta_1$  and  $\beta_2$ . The  $\beta_1$  parameter estimates the effect of ILE reform exposure on the different educational and labour market outcomes. The variable *Post ILE<sub>st</sub>* is constructed as an interaction variable that takes the value of one if the individual was living in Mexico City and the time of response is the third quarter of 2007 or later. The third quarter was the first period in the data set when abortions were legal for the full quarter.  $\beta_2$  estimates the

<sup>1</sup> A detailed list of what states implemented regressive law changes and at what dates, see Table A1 in the Appendix.

impact of regressive law changes on education and labour supply. *Regressive Law Changes<sub>st</sub>* is an interaction variable that takes the value of one for individuals living in states that imposed regressive law changes following the ILE reform, after the legislative changes were implemented in the different states.

Labour market outcomes are measured on the extensive and the intensive margin. The extensive margin refers to the share of women that are currently in the labour force and is therefore a value between 0-1. The intensive margin is measured as a change in the number of hours worked per week. To estimate the effect of the abortion reforms on school attendance, the dependent variable will instead refer to the impact on years of schooling as well as the share of women who complete high school. In order to not risk catching girls who have not had the time to finish high school yet, the sample is restricted to girls who were possibly affected by the reform. I consequently limit the sample in each time-period of the survey to young women between the ages of 18-25 years.

*Age<sub>ist</sub>* refers to age fixed effects.  $\theta_s$  refers to state fixed effects and  $\gamma_t$  refers to time fixed effects (year and quarter of the year). These are included in all specifications. It is common to include control variables such as marital status and number of children in the household when estimating labour market outcomes (Oreffice, 2007). There is a risk that controls of that type are themselves outcome variables affected by the abortion laws (Angrist & Pischke, 2008). Hence, I will not include this type of control variables. Instead, controls measuring the overall labour market status on state-level will be included.  $X'_{st}$  represents a set of time-varying state-level controls (state unemployment rate and state poverty rate), which is added in some specifications to check the stability of the specification. When I estimate the reform impacts on schooling outcomes, I include the same fixed effects and control variables as for labour market outcomes. Sample weights are included in all specifications.

The standard errors are clustered at the state level to control for serial correlation. However, the number of clusters (32) is on the border of being too small and does not fulfil the asymptotic validity of clustered standard errors (Bertrand, Duflo & Mullainathan, 2004). To deal with this issue, Bertrand, Duflo and Mullainathan (2004) suggest using bootstrapping to avoid understating the standard deviation of the estimated coefficients, which could possibly lead to overestimation of the significance of the results. I calculate the standard errors using a wild bootstrap procedure with Rademacher resampling weights (Cameron & Miller, 2015).

## 4.1 Validity

The Mexican economy and its labour market were negatively impacted by the economic crisis in 2008-2009. A large number of formal jobs disappeared, as did many informal jobs, which resulted in increased unemployment rates (Freije, López-Acevedo & Rodríguez-Oreggia, 2011). The Great Recession in 2008 occurred just a year later than the ILE reform. The whole Mexican economy was affected, and the labour market structures changed. Since the labour market structure differs between Mexico City and the rest of the country, I may therefore worry that the recession affected Mexico City differently as compared to other states in Mexico. To control for this potential issue, I add a control variable for state-level unemployment rates. It is constructed as a ratio between the employed population and the economically active population (i.e. the employed and unemployed population). The unemployment rate control variable in combination with state fixed effects are expected to capture enough of the effects of the recession to isolate those effects from the ILE reform and the regressive changes.

Another potential threat to the identification is the presence of spill-over effects. 23.5 per cent of the clients obtaining abortion services in Mexico City following the ILE reform came from the neighbouring Mexico state (Becker & Olavarrieta, 2013). A spill-over effect could potentially underestimate the effect of the ILE reform on outcomes in Mexico City. To control for spill-over effects from Mexico state, I include an interaction term, where the state of residence (Mexico state) is interacted with the post-reform period (i.e. third quarter of 2007 or later).

To examine whether the ILE reform had heterogeneous effects on different age cohorts, regressions will be run separately for different age cohorts. The motivation behind this is the different levels of abortion utilisation for different age groups. It has been shown that in many parts of the world, women in their early twenties utilise abortion services to a larger extent than other age groups (Singh et al., 2018). Development levels in Mexico vary substantially between different states and urban and rural areas. Mexico City is a densely populated area and the largest city in the country (Singh et al., 2018). I will, therefore, estimate labour market outcomes conditioned on the level of urbanisation.

To further ensure the validity of the methodological approach and that the parallel trend assumption is fulfilled, I quantify leads and lags of reform effects in an event-study specification (Freyaldenhoven, Hansen & Shapiro, 2018). In this specification, the indicators for being a resident in Mexico City and the regressive states are interacted with indicators for each year. The leads estimate the occurrence of trends prior to the reform, whereas the lags reflect possible changes in the educational and labour market outcomes after the reforms. Since the parallel trend assumption cannot be explicitly tested, I instead examine the presence of trends in outcome variables in the pre-treatment period. If the estimates are to be interpreted causally, there should not be any point estimates distinguishable from zero prior to the reforms. If the ILE reform and the regressive law changes had a significant effect on the exposed groups, I should observe estimates that are significantly different from zero in the years after the reforms.

The following specification is estimated:

$$Outcome_{st} = \alpha_0 + \sum_{j=-2}^{10} \delta_{-j} \Delta ILE_{st+j} + \sum_{k=-3}^9 \gamma_{-k} \Delta Regressive_{st+k} + X'_{st} + Age_{ist} + \theta_s + \gamma_t + \varepsilon_{ist} \quad (2)$$

$\delta$  and  $\gamma$  are the main parameters of interest.  $\delta$  estimates the difference in outcomes between Mexico City and control states and  $\gamma$  predicts the difference in outcomes for regressive states and other non-exposed states. For the ILE reform estimates, the baseline year is 2007 (the year of the reform) and is omitted from the specification. This results in two leads and ten lags. For the regressive reform estimates, the baseline omitted year is 2008, which results in three leads and nine lags. Additionally, I perform two placebo reform tests for labour market outcomes with the same empirical strategy as in the main model. If the parallel trend assumption is to hold, none of these tests should yield any significant outcomes. First, I limit the sample to women aged 45-65 years. They are not considered to be in fertile ages anymore, they should not experience any changes in labour supply because of the abortion reforms. In the second robustness test, I instead restrict the sample to men aged 15-44 years. They are not directly affected by a change in the legal status of abortions, and I consequently do not expect to find any significant impact on their labour force participation. For the educational outcomes, I perform two similar robustness tests where I examine the effect of abortion reforms on educational outcomes for women aged 45-65 years and for young men aged 18-25 years. Neither of these groups are expected to be directly affected by the abortion reforms.

# 5 Results

## 5.1 Labour Market Outcomes

I begin with estimating whether the ILE reform or the regressive law changes had any impact on women’s decision to participate in the labour force, the so-called extensive margin. Regression outcomes are presented in Table 3. In the baseline difference-in-differences model in Column 1, state, time and age fixed effects are used, estimated according to equation 1. Time-varying state-level controls are added in Column 2. Column 3 shows the estimates from a specification adding a control variable for the residents of Mexico state after the reform to control for spill-overs.

*Table 3: Difference-in-Differences Estimates of Legal Reforms on Labour Supply (Extensive Margin)*

VARIABLES	(1) Labour supply	(2) Labour supply	(3) Labour supply
Post ILE reform	0.0102*** (0.00280)	0.00795* (0.00416)	0.00748 (0.00448)
Post Regressive Law Changes	0.00300 (0.00417)	0.00208 (0.00412)	0.00201 (0.00410)
Constant	0.0987*** (0.0139)	0.0929*** (0.0231)	0.0928*** (0.0231)
Observations	5,346,583	5,346,583	5,346,583
Mean of dependent variable	0.466	0.466	0.466
State, time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on the extensive margin of female labour force participation. The sample is restricted to women between 15-44 years. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The estimates for the ILE reform suggest that there is mixed evidence for the impact on labour force participation. In Column 1 and 2, I observe a significant positive impact of the ILE reform, of 0.0102-0.00795 on the share of women who participate in the labour force. This effect corresponds to 1.5-2.1 per cent change when comparing the estimates to the mean of the dependent variable. These increases are relatively small changes, considering that the mean of

the dependent variable is 46.6 per cent. As the control variable for Mexico state spill-over effects is added, there is no longer any significant impact. There is no significant impact of the regressive law changes on labour force participation in any of the specifications.

To assess the validity of the results, I present event studies for the progressive as well as regressive law changes in Figure 1. The left-hand panel shows that there were significantly negative impacts of the ILE reform on female labour force participation, prior to the reform as well as afterwards. The validity of the estimates of ILE reform effects is thus to be questioned because of lacking support for parallel trends in outcomes in the pre-treatment period. The right-hand panel suggests that the regressive law changes did not have any significant impact on the labour supply either before or after the omitted baseline year. Since there is no significant impact in the years leading up to the reforms, the estimates yield some support for the parallel trend assumption.

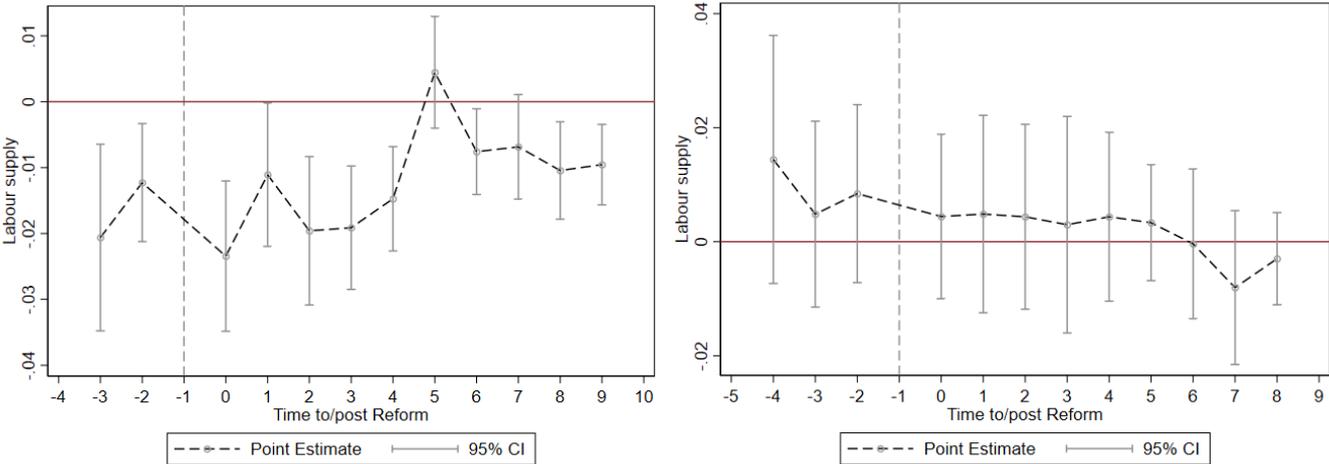


Figure 5: Event Studies for Labour Supply (Extensive Margin)

Notes: Event studies present the development of labour force participation surrounding the legislative changes. The left-hand panel displays the ILE reform estimates and the right-hand panel displays the estimates of the regressive law changes. Each point estimate represents a change in labour force participation between treated and non-treated federal states and is compared to the baseline year (one year prior to the reform). Confidence intervals (95%) are presented for each point estimate. A full set of time-varying state-level controls are included.

Estimates of ILE reform impacts and impacts from regressive law changes on the intensive margin of the labour supply are shown in Table 4. The methodological approach is identical to that of the extensive margin model, except for a change of the dependent variable. It can be shown that in all specifications, the ILE reform had a significant and positive impact on the

average number of hours worked by women per week. Results are ranging from 0.8-0.95 more hours worked per week following the reform. The impacts are relatively large of 4.6-5.5 per cent, when comparing it with the mean of the dependent variable of 17.3 hours worked per week. The significance of the point estimate in the baseline specification is stable to the inclusion of additional control variables. The regressive law changes, on the other hand, yield negative point estimates, although insignificantly different from zero in all specifications.

*Table 4: Difference-in-Differences Estimates of Legal Reforms on Hours Worked Per Week*

VARIABLES	(1) Hours worked last week	(2) Hours worked last week	(3) Hours worked last week
Post ILE reform	0.799*** (0.103)	0.947*** (0.151)	0.942*** (0.162)
Post Regressive Law Changes	-0.0966 (0.149)	-0.0746 (0.141)	-0.0754 (0.141)
Constant	3.327*** (0.516)	4.473*** (0.884)	4.472*** (0.885)
Observations	5,346,583	5,346,583	5,346,583
Mean of dependent variable	17.32	17.32	17.32
State, time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on the intensive margin of female labour force participation (average number of hours worked per week), for different age cohorts. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Event studies are presented in Figure 6. The statistically significant outcomes in the pre-reform periods of the ILE reform question the validity of the estimations, as there is not enough support for the parallel trend assumption, and hence no causal interpretation of the results can be done. The right-hand panel presents point estimates for the regressive states. There is no effect distinguishable from zero prior to the reform, which suggests that there were no common trends in outcomes in the pre-reform period. There is, although, no significant impact after the reforms either.

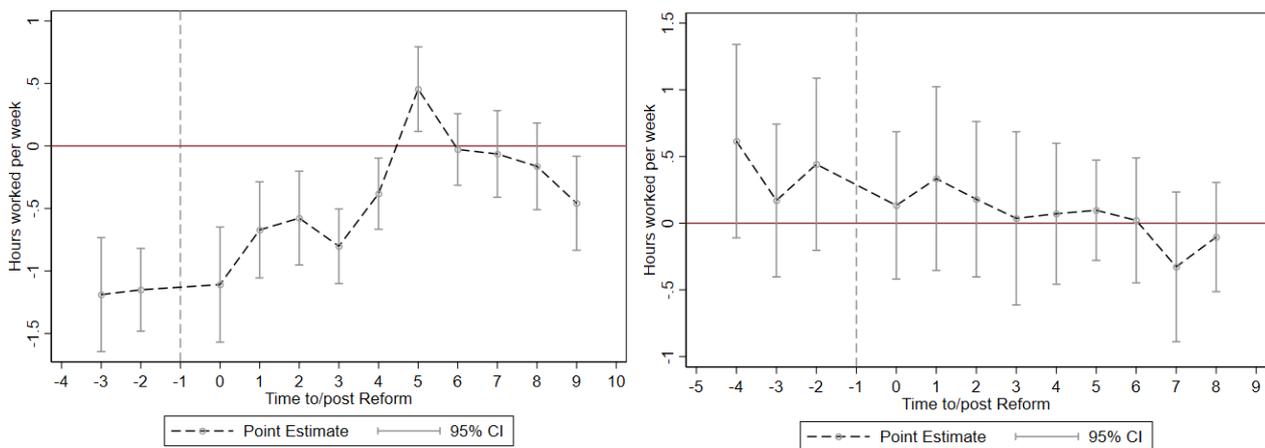


Figure 6: Event Studies for Hours Worked Per Week (Intensive Margin)

Notes: Event studies present the development of average hours worked per week surrounding the legislative changes. The left-hand panel displays the ILE reform estimates and the right-hand panel displays the estimates of the regressive law changes. Each point estimate represents a change in labour force participation between treated and non-treated federal states and is compared to the baseline year (one year prior to the reform). Confidence intervals (95%) are presented for each point estimate. A full set of time-varying state-level controls are included.

Abortion rates are estimated to be higher in women's early and mid-twenties, a pattern which is shown to exist in regions of different development levels across the country (Juarez et al., 2013; Singh et al., 2018). This motivates an estimation of heterogeneous effects for different age cohorts presented in Table 5. When the sample is divided into five-year cohorts, the ILE reform showed a significant positive impact on the extensive margin of the labour supply of women in the ages of 20-24, 25-29, and 30-34 years. There is no significant effect on girls aged 15-19 years old. In that cohort, there is also a reduction of more than half in the proportion that participates in the labour force. There is no significant impact of the regressive law changes in any of the age cohorts. When the control variable for Mexico state is subtracted from the model, the estimates remain largely unchanged, however, the significance of the point estimate for the women aged 20-24 years disappears. The results for estimations without the Mexico State control are shown in Table A2 in the Appendix.

*Table 5: Difference-in-Difference Estimates of Legal Reforms on Labour Supply – Heterogeneous Effects*

VARIABLES	(1) 15-19 years	(2) 20-24 years	(3) 25-29 years	(4) 30-34 years	(5) 35-39 years	(6) 40-44 years
Post ILE reform	-0.00172 (0.00432)	-0.0124* (0.00730)	0.0343*** (0.00630)	0.0131** (0.00616)	-0.00854 (0.00652)	-0.00488 (0.00636)
Post Regressive Law Changes	0.000372 (0.00724)	0.00489 (0.00618)	0.00643 (0.0101)	-0.0125 (0.00762)	0.00222 (0.00633)	0.00862 (0.00785)
Constant	0.0882*** (0.0149)	0.384*** (0.0225)	0.533*** (0.0199)	0.482*** (0.0219)	0.494*** (0.0221)	0.517*** (0.0216)
Observations	1,058,391	981,857	860,892	827,780	825,422	791,345
Mean of dependent variable	0.204	0.426	0.538	0.553	0.570	0.585
State, time and age FE	Yes	Yes	Yes	Yes	Yes	Yes
State-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Mexico State control	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on the extensive margin of female labour force participation for different age cohorts. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The heterogeneous effects on the intensive margin of the labour force are presented in Table 6. The ILE reform had an apparent significant positive effect on the labour supply of women in the four oldest cohorts of the sample, as well as in the youngest cohort. The estimates suggest that there is no significant impact on women aged 20-24 years. As the Mexico state control is excluded from the specification, there is a slight change in significance levels. There is no longer any significant impact of the ILE reform on women aged 20-24 years. Women aged 30-34 years now experience a negative impact of the regressive law changes (results can be found in Table A3 in Appendix). There are significant negative effects on the intensive margin of labour supply for women aged 30-34 years who live in states that imposed regressive law changes, but no effect in any of the other cohorts.

Table 6: Difference-in-Difference Estimates of Legal Reforms on Hours Worked Per Week – Heterogeneous Effects

VARIABLES	(1) 15-19 years	(2) 20-24 years	(3) 25-29 years	(4) 30-34 years	(5) 35-39 years	(6) 40-44 years
Post ILE reform	0.507*** (0.171)	-0.0357 (0.340)	1.760*** (0.244)	1.168*** (0.249)	0.728*** (0.254)	0.435* (0.226)
Post Regressive Law Changes	-0.243 (0.193)	0.415 (0.257)	0.381 (0.393)	-0.846** (0.345)	-0.214 (0.280)	-0.0966 (0.349)
Constant	4.107*** (0.552)	17.00*** (1.043)	22.93*** (0.792)	19.92*** (0.860)	20.56*** (0.809)	20.94*** (0.838)
Observations	1,058,391	981,857	860,892	827,780	825,422	791,345
Mean of dependent variable	7.031	16.46	20.61	20.55	20.97	21.42
State, time and age FE	Yes	Yes	Yes	Yes	Yes	Yes
State-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Mexico State control	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on the intensive margin of female labour force participation (average number of hours worked per week), for different age cohorts. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### 5.1.1 Robustness Tests

Since fertility patterns in Mexico have been shown to vary depending on the level of urbanisation (Juarez et al., 2013), I also estimate the reform impacts on urban areas. The treatment and control groups hence only include respondents who live in cities with 100 000 inhabitants or more. By only including individuals residing in more urbanised areas, the treatment and control group share more similar characteristics. Results are presented in Table A4 in the Appendix and indicate that there are barely any significant outcomes in the extensive margin estimations. The first specification with no control variables included show a significant positive effect of the ILE reform, however, the result is not stable to the inclusion of further controls. The estimates of the regressive law changes do not show any impact in the baseline specification. As state-level controls and a spill-over control variable are included, there is a small and significant negative impact on labour force participation. When the sample group is expanded to also include respondents living in urban areas with more than 15 000 inhabitants in Table A5, there is no change in the ILE reform effects. Although, there is now a significant negative impact on the labour supply of the regressive law changes across all different specifications.

The estimations of ILE reform effects on the intensive margin of labour supply show significant and positive effects for all specifications, the results are displayed in Table A6 in the Appendix. There are negative impacts of the regressive law changes across all specifications. When also allowing for respondents in less urbanised areas (15 000 inhabitants and more) in Table A7, the significant and negative effect from the regressive law changes remains in all specifications. There is, however, only significant impact of the ILE reform in the baseline specifications without control variables. These results suggest that there is, in fact, a difference in the way people are affected by the reforms, depending on if they live in less or more urbanised areas.

### 5.1.2 Placebo Tests

In addition to the event studies, I perform placebo tests to assess the validity of the methodological approach. First, I examine whether the abortion reforms had any impact on the labour force participation of men in the same ages (i.e. 15-44 years). I use the same model as in the main specification. The estimations for the extensive margin of male labour supply can be found in Table A8 in the Appendix. There is significant impact of the ILE reform in two of the specifications. The regressive law changes have no significant impact on male labour supply. The estimations for the intensive margin are presented in Table A9 in the Appendix and suggest that there is no significant impact on the intensive margin of male labour force participation, either from the ILE reform or the regressive law changes.

Additionally, I control for effects among women aged 45-65 years. These women are still in working age but generally not considered to be in fertile ages anymore. The results are obtained using an identical methodological approach as compared to the baseline models, but the sample is restricted with regards to the age group of interest. The results for the reform effects on the extensive margin of labour supply are displayed in Table A10 in the Appendix. There is a significant and positive impact on older women in Mexico City following the ILE reform. The significance is not stable to the inclusion of additional control variables. The regressive abortion reforms did not appear to have any significant impact on older women exposed to the reforms. The estimated impacts on the intensive margin of labour supply for older women are displayed in Table A11 in the Appendix. There is a significant positive impact of the ILE reform on hours worked per week across all specifications. There is, however, no significant impact of the regressive law changes in any of the specifications.

## 5.2 Educational Outcomes

The difference-in-differences estimates of the reform effects on high school completion are presented in Table 7.

*Table 7: Difference-in-Differences Estimates of Legal Reforms on High School Completion*

VARIABLES	(1) Completed high school	(2) Completed high school	(3) Completed high school
Post ILE reform	-3.60e-06 (0.00178)	0.000951 (0.00150)	0.00226 (0.00142)
Post Regressive Law Changes	0.00329** (0.00150)	0.00354** (0.00151)	0.00371** (0.00157)
Constant	-0.0208*** (0.00511)	-0.0154** (0.00620)	-0.0152** (0.00625)
Observations	7,565,736	7,565,736	7,565,736
Mean of dependent variable	0.182	0.182	0.182
State time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on high school completion for young women between 18-25 years. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The results suggest that the ILE reform did not have any significant impact on young women aged 18-25 years. The regressive legal changes appear to have resulted in significant, but very small increases in the share of women who completed high school. The significance level is stable across all specifications. The event study presented in the left-hand panel of Figure 7 suggests that the ILE reform estimates should not be interpreted causally since the reform appears to have had a statistically significant impact in the years before the reform. However, the regressive reform point estimates presented in the right-hand panel display insignificant impacts before as well as after the regressive reforms, which consequently implies that there are signs of a causal relation.

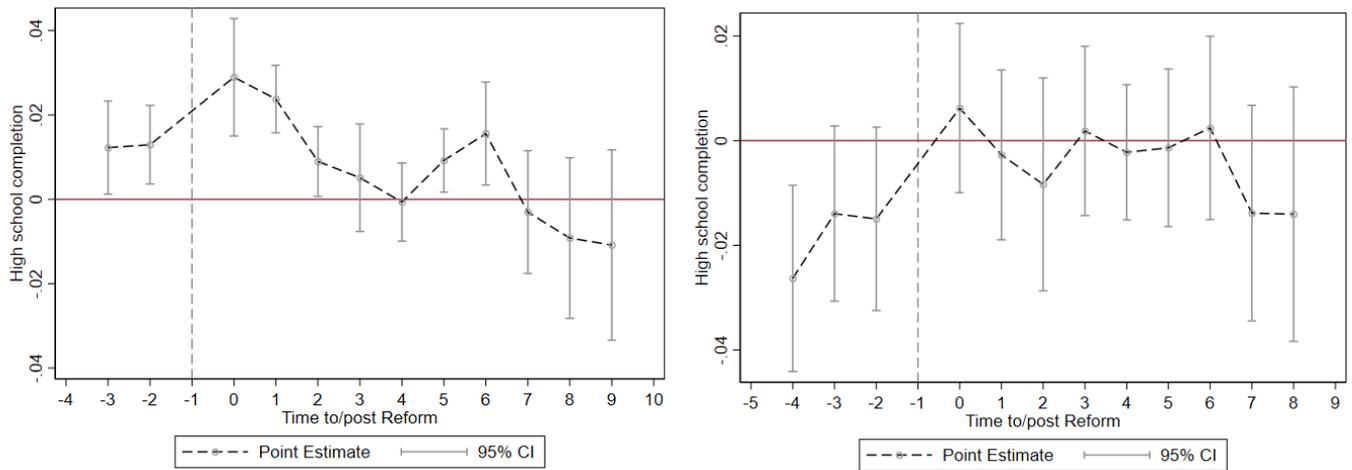


Figure 7: Event Studies for High School Completion

Notes: Event studies present the development of high school completion surrounding the legislative changes. The left-hand panel displays the ILE reform estimates and the right-hand panel displays the estimates of the regressive law changes. Each point estimate represents a change in the share of women that completes high school between treated and non-treated federal states and is compared to the baseline year (one year prior to the reform). Confidence intervals (95%) are presented for each point estimate. A full set of time-varying state-level controls are included.

The results from the reforms on the number of years of schooling are presented in Table 8. The point estimates for the ILE reform suggest that the legalisation of abortions decreased the years of schooling by 0.11-0.14 years. This effect is equivalent to a 1.2-1.5 per cent change when comparing the estimates to the mean of the dependent variable. It can be considered as a relatively small change in relation to the average years of schooling of 9.5 years. The regressive law changes appear to not have had any significant impact on the years of schooling.

Table 8: Difference-in-Differences Estimates of Legal Reforms on Years of Schooling

VARIABLES	(1) Years of schooling	(2) Years of schooling	(3) Years of schooling
Post ILE reform	-0.141*** (0.0258)	-0.110*** (0.0261)	-0.111*** (0.0293)
Post Regressive Law Changes	-0.0247 (0.0260)	-0.0161 (0.0243)	-0.0163 (0.0242)
Constant	7.519*** (0.151)	7.683*** (0.143)	7.682*** (0.143)
Observations	7,555,395	7,555,395	7,555,395
Mean of dependent variable	9.508	9.508	9.508
State, time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on years of schooling for young women between 18-25 years. Sample weights are used, and standard errors are clustered at

the state level and calculated using a wild bootstrap procedure. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Event study estimates are presented in Figure 8. The ILE reform estimates are statistically different from zero in the pre-reform years, and hence do not provide enough support for a causal relation. The estimations of the regressive reform effect on years of schooling appear to reflect a causal relation. Two out of three pre-reform years yield estimates that are not distinguishable from zero.

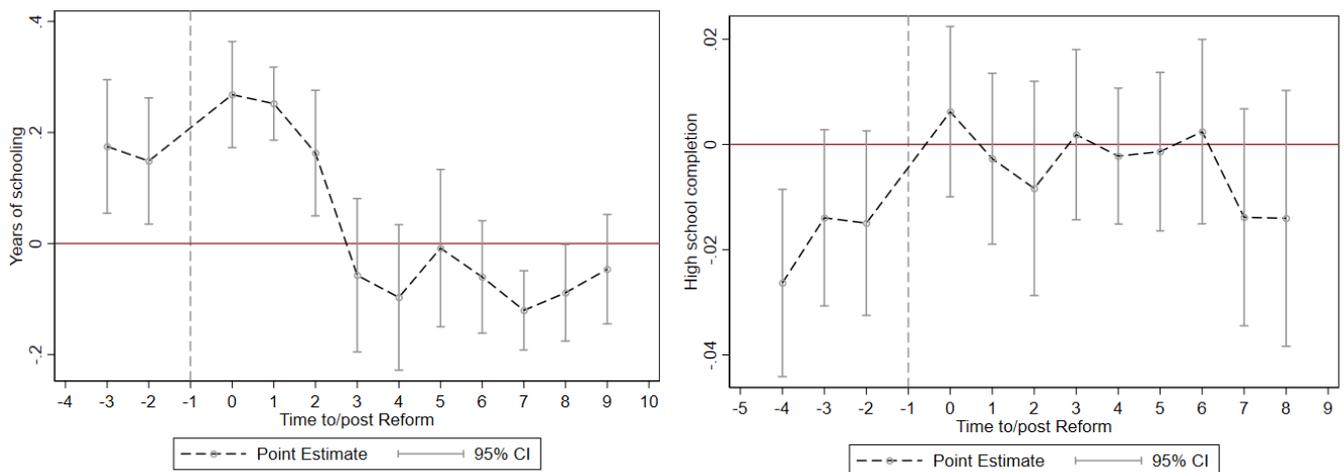


Figure 8: Event Studies for Years of Schooling

Notes: Event studies present the development of years of schooling surrounding the legislative changes. The left-hand panel displays the ILE reform estimates and the right-hand panel displays the estimates of the regressive law changes. Each point estimate represents a change in the average years of schooling between treated and non-treated federal states and is compared to the baseline year (one year prior to the reform). Confidence intervals (95%) are presented for each point estimate. A full set of time-varying state-level controls are included.

### 5.2.1 Placebo Tests

To further evaluate the validity of the difference-in-differences estimates of the ILE reform, I perform placebo tests for the high school completion models as well as the years of schooling models. I control for effects among women aged 45-65 years and young men aged 18-25 years. The results are obtained with the same specification as in the main model, although the sample is restricted with regards to the age group of interest. Results for the abortion reform effects on high school completion for young men are presented in Table A12, and there are significant outcomes across all specifications. Table A13 displays the impact of the reforms on the years of schooling where there is a significant impact of the ILE reform but not the regressive changes. There is no effect of either the ILE reform or the regressive changes on older women's

educational outcomes, except for in two cases where the ILE reform has a significant negative impact on the years of schooling. The schooling outcomes after the ILE reform should be interpreted with caution since there is not enough evidence for a causal relation. The impacts of the regressive reforms, on the other hand, appear to reflect causal impacts on educational outcomes.

## 6 Discussion and Conclusion

In many previous studies, researchers have worried about fertility being an endogenous determinant of female labour force participation. Abortion legalisation can thus serve as exogenous variation in fertility rates. Nevertheless, concerns have been made about the fact that abortion legislation potentially reflects underlying social values of the population, and hence it will be an endogenous determinant either way (Bertrand, Duflo & Mullainathan, 2004). Abortion laws are not necessarily random, but I will argue that the ILE reform did not to a great extent reflect the public opinion on abortions in Mexico City prior to the reform. Immediately before the ILE reform in 2007, public policy research showed that only 38 per cent of adults in Mexico City were in favour of the legislative change. Two years after the implementation, there had been nearly a doubling in public support for the abortion law, as 74 per cent of the adult population in Mexico City supported the legislative change (Becker & Olavarrieta, 2013).

Based on the estimations of the Mexican abortion law reform effects in this study, I observe ambiguous effects on educational and labour market outcomes. The extensive and the intensive margins of labour supply appear to have been positively affected by the ILE reform. However, support for the parallel trend assumption is weak in both cases when both the placebo tests and the event studies are considered. The causality of these estimations should hence be interpreted cautiously. There was close to no impact of the regressive law changes in any of the models or for any age groups in the post-treatment periods. There appear to be no pre-reform impacts of the regressive law changes on labour force participation, which yields some support to the parallel trend assumption. It is, nevertheless, important to consider that abortions were illegal in the regressive states already before the reforms were implemented and stricter sanctions were imposed, hence a small or null impact was to be expected.

When controlling for heterogeneous effects on labour force participation, I observe positive impacts of the ILE reform on all age groups except for women aged 20-24 years. These estimates are surprising since research has shown that women of those ages utilise abortion services the most (Juarez et al., 2013; Singh et al., 2018). I also find that it is important to control for spill-over effects from Mexico state, as the effects might otherwise be

underestimated. This is observed in the extensive margin specification, where there are fewer significant outcomes in the specification without the control variable for the neighbouring state. Moreover, it is important to take the potential problems with multiple hypothesis testing into account. When several hypotheses are simultaneously tested, there is an increasing risk that true null hypotheses are rejected by chance (Romano, Shaikh & Wolf, 2010). I have not analysed this issue in depth in this study but leave a deeper analysis of this issue to future research. Nevertheless, this has implications on the significance levels of the estimated heterogeneous effects, and the point estimates should hence be interpreted with caution.

There is a slight difference in the share of women that is part of the labour force and the number of hours worked per week when heavily urbanised areas are compared to the country average (see Table 1). Interestingly, the estimated impacts on the extensive and intensive margin of the female labour supply differ when allowing for different levels of urbanisation in the sample (see Table A4-7 in the Appendix). The effects of the regressive reforms are more significant and negative when the sample is expanded from only urban areas with more than 100 000 inhabitants to urban areas with 15 000 inhabitants or more. These results could indicate that women in less urbanised areas are more negatively affected by the regressive law changes, in case abortion services are more difficult to access.

The aftermath of the financial crisis of 2008 is another possible explanation to the labour market dynamics in the post-reform period in Mexico. Mexico was hit hard (Freije, López-Acevedo & Rodríguez-Oreggia, 2011), and it is possible that my attempts to control for the effects of the crisis did not fully capture the general equilibrium effects. Since the effects of the crisis rippled through multiple sectors in many countries of the world, I consider a deeper analysis of this aspect to be outside the scope of this study and could be a subject for future studies within this area of research.

This study has not investigated through what channels the ILE reform could have affected women's decision to take part in the labour force. With the high number of abortions performed in the post-reform years (Schiavon et al., 2010; Becker & Olavarrieta, 2013), fertility rates are likely to have been affected, which was shown by Clarke and Mühlrad (2018). Many previous studies have concluded that reductions in fertility rates are positively correlated with increased female labour force participation (Angrist & Evans, 1998; Goldin & Katz, 2002; Canning & Schultz, 2012; Lundborg, Plug, Rasmussen, 2017; Aaronson et al., 2018), and an extension of

this study could delve deeper into possible connections between abortions, fertility rates, and labour market outcomes for women in Mexico City.

When schooling outcomes are considered, I find no apparent effect of the ILE reform on high school completion. The effect on years of schooling is surprisingly negative and significant, which contradicts previous findings in similar settings (Guldi, 2008; Mølland, 2016; González et al., 2018). However, the event study as well as the placebo test do not provide any support for causality. These estimates should hence be interpreted with great caution. A possible explanation for the lack of significant impact of the ILE reform on educational outcomes could be the low number of abortions in the younger age groups. Only approximately five per cent of the abortion clients was women below the age of 18 years (Mondragón y Kalb, 2011). On the other hand, women aged 20-24 years belong to a group that utilises abortions to a greater extent, and their educational outcomes would have been expected to be affected by the ILE reform (Juarez et al., 2013; Singh et al., 2018).

The regressive reforms seem to have led to an increase in the share of women who complete high school, which is not in line with previous studies where it is often found that adolescent childbearing complicates education (e.g. Mooney Marini, 1984; Mott & Marsiglio, 1985; Hoffman, 2008; Fletcher & Wolfe, 2009; Kane et al., 2014). As is shown in the event study and placebo test, there is also a reason to believe the causal impact of these estimates. Pop-Eleches (2010) has previously found that regressive law changes have resulted in sharp increases in fertility. Estimates in a study by Clarke and Mühlrad (2018) suggest that there was not any significant impact of the regressive law changes on fertility in Mexico. In this study, my estimates suggest that there was barely any significant impact of regressive reforms on either the intensive or extensive margin of labour force participation or on the years of schooling. I have not examined whether the abortion legalisation had any causal effects on fertility rates of young women or if there were any other mechanisms at play that affected schooling outcomes. Since the reform also meant an increase in sexual education (Becker & Olavarrieta, 2013), pregnancies could have been prevented to begin with and hence result in a lower need for abortions. It has, although, been outside the scope of this study to examine through what channels the abortion reforms could have affected schooling outcomes. There is, consequently, a need for more extensive research on why women's educational outcomes seem to be affected by regressive abortion law changes.

It would have been beneficial to utilise a panel data where the same individuals are followed over a longer time- period. In that case, I could have calculated each individual's exposure to the reform (similar to the approach of Mølland, 2016) in order to obtain more precise estimates. Moreover, I only have access to two years of data prior to the ILE reform. To gain a deeper understanding of possible prevailing trends in the pre-reform period, it would have been beneficial to utilise a data set which extends further back in time. This would enable a more extensive assessment of the parallel trend and hence yield more validity to the causal relationship between abortion reforms and educational and labour market outcomes.

To conclude, the area of research that has been the focus of this study is becoming increasingly important as the right to legal and safe abortions is once again challenged in many places, most recently in May 2019 in Alabama in the U.S.. It is important to understand the full-scale impact of hindrances to women's reproductive health. As women's rights are intruded on, there is often a widespread impact on for example families, children and other aspects of women's as seen here and previous studies.

# References

- Angrist, J. D., and Evans, W. N. (1998). Children and Their Parents' Labor Supply: Evidence from Exogenous Variation in Family Size. *American Economic Review*, Vol 8., No. 3, pp, 450-477.
- Angrist, J. D., and Evans, W. N. (1999). Schooling and Labor Market Consequences of the 1970 State Abortion Reforms. *Research in Labor Economics*. Vol. 18, pp. 75-113.
- Angrist, J. D., and Pischke, J.S. (2008). Mostly Harmless Econometrics: An Empiricist's Companion. *Princeton University Press*.
- Aaronson, D., Dehejia, R., Jordan, A., Pop-Eleches, C., Samii, C., and Schulze, K. (2018). The Effect of Fertility on Mother's Labor Supply over the Last Two Centuries. NBER Working Paper No. 23717, National Bureau of Economic Research.
- Becker, D. and Olavarrieta, C. D. (2013). Decriminalization of Abortion in Mexico City: The Effects on Women's Reproductive Rights. *American Journal of Public Health*. 103, no. 4, pp. 590-593.
- Bertrand, M., Duflo, E., and Mullainathan, S. (2004). How Much Should We Trust Differences-in-Differences Estimates? *The Quarterly Journal of Economics*, Vol. 119, No. 1, pp. 249-275.
- Bloom, D. E., Canning, D., Fink, G., and Finlay, J. E. (2009). Fertility, Female Labor Force Participation and the Demographic Dividend. *Journal of Economic Growth*. Vol. 14, Issue 3, pp. 79-101.
- Cameron, A. C. and Miller, D. L. (2015). A Practitioner's Guide to Cluster-Robust Inference. *Journal of Human Resources*, Vol. 50, pp. 317-372.
- Campos-Vazquez, R. M. and Velez-Grajales, R. (2014). Female Labour Supply and Intergenerational Preference Formation: Evidence for Mexico. *Oxford Development Studies*. Vol. 42, No. 4, pp. 553-569.
- Canning, D. and Schultz, P. (2012). The Economic Consequences of Reproductive Health and Family Planning. *The Lancet*. Vol. 380, Issue 9837, pp. 165-171.

- Clarke, D. and Mühlrad, H. (2016). The Impact of Abortion Legalization on Fertility and Female Empowerment: New Evidence from Mexico. *CSAE Working Paper*, WPS/2016-33.
- Clarke, D. and Mühlrad, H. (2018). Abortion Laws and Women's Health. *IZA Discussion Papers*.
- Cunningham, S., Lindo, J. M., Myers, C., and Schlosser, A. (2018). How Far Is Too Far? New Evidence on Abortion Clinic Closures. NBER Working Paper No. 23366, National Bureau of Economic Research.
- Donohue, J. J., and Levitt, S. D. (2001). The Impact of Legalized Abortion on Crime. *Quarterly Journal of Economics*. Vol. 141, No. 2, pp. 379-420.
- Fischer, S., Royer, H., and White, C. (2017). The Impacts of Reduced Access to Abortion and Family Planning Services on Abortion, Births and Contraceptive Purchases. NBER Working Paper No. 23634, National Bureau of Economic Research.
- Fletcher, J. M., and Wolfe, B. L. (2009). Education and Labor Market Consequences of Teenage Childbearing. Evidence Using the Timing of Pregnancy Outcomes and Community Fixed Effects. *Journal of Human Resources*. Vol. 44, pp. 303-325.
- Freije, S., López-Acevedo, G., and Rodríguez-Oreggia, E. (2011). Effects of the 2008-2009 Economic Crisis on Labor Markets in Mexico. *World Bank Policy Research Working Papers*.
- Freyaldenhoven, S., Hansen, C., and Shaphiro, J. M. (2018). Pre-event Trends in the Panel Event-study Design. NBER Working Paper No. 24565, National Bureau of Economic Research.
- Goldin, C., Katz, L. F. (2002). The Power of the Pill: Oral Contraceptives and Women's Career and Marriage Decisions. *Journal of Political Economy*. Vol 110, No. 4, pp. 730-770.
- González, L., Jiménez-Martín, S., Nollenberger, N., & Vall-Castello, J. (2018). The Effect of Abortion Legalization on Fertility, Marriage and Long-Term Outcomes for Women, Working Papers 1035, Barcelona Graduate School of Economics.
- Grimes, D. A., Benson, J., Singh, S., Romero, M., Ganatra, B., Okonofua, F. E., and Shah, I. H. (2006). Unsafe Abortion: The Preventable Pandemic. *The Lancet*, Vol. 368, pp. 1908-1919.
- Guldi, M. (2008). Fertility Effects of Abortion and Birth Control Pill Access for Minors. *Demography*. Vol. 45, No. 4, pp. 817-827.

- Guttmacher Institute. (2018). Fact Sheet - Abortion in Latin America and the Caribbean. Available at: [https://www.guttmacher.org/sites/default/files/factsheet/ib\\_aww-latin-america.pdf](https://www.guttmacher.org/sites/default/files/factsheet/ib_aww-latin-america.pdf) (Accessed on 2019-04-27).
- Heckman, J. (1993). What Has Been Learned About Labor Supply in the Past Twenty Years? *The American Economic Review*. Vol. 83, No. 2. pp. 116-121.
- Hoffman, S. D. (2008). Updated estimates of the consequences of teen childbearing for mothers. In Hoffman & Maynard (Eds.), *Kids having kids* (pp. 74–118). Washington: Urban Institute Press.
- Hotz, J. V., McElroy, S. W., and Sanders, S. G. (2005). Teenage Childbearing and Its Life Cycle Consequences. *Journal of Human Resources*. Vol. 40, pp. 683-715.
- INEGI, Instituto Nacional de Estadística Geográfica e Informática. Encuesta nacional de ocupación y empleo, <http://en.www.inegi.org.mx/programas/enoe/15ymas/default.html#Microdata> (Accessed 30 March 2019).
- Juarez, F., Singh, S., Maddow-Zimet, I., and Wulf, D. (2013). Unintended Pregnancy and Induced Abortion in Mexico: Causes and Consequences, New York: Guttmacher Institute.
- Kalish, D. (2004). Abortion and Female Labor Force Participation: Evidence Prior to Roe v. Wade. *Journal of Labor Research*, vol. 25, no. 3, pp. 503-514.
- Kane, J. B., Morgan, P. S., Harris, K. M., and Guilkey, D. K. (2014). The Educational Consequences of Teen Childbearing. *Demography*. Vol 50, No. 6, pp. 2129-2150.
- Klerman, J. A. (1999). U.S. Abortion Policy and Fertility. *American Economic Review*. Vol. 89, No. 2, pp. 261-264.
- Langer, A., Sanhueza, P., and Senderowicz, L. (2018). Education, Place of Residence and Utilization of Legal Abortion Services in Mexico City, 2013-2015. *International Perspectives on Sexual and Reproductive Health*. Vol 44, No. 2, pp. 43-50.
- Levine, P. B., Staiger, D., Kane, J., and Zimmerman, D. J. (1999). Roe v. Wade and American Fertility. *American Journal of Public Health*. Vol. 89, pp. 199-203.
- Lundborg, P., Plug, E., and Rasmussen, A. W. (2017). Can Women Have Children and a Career? IV Evidence from IVF Treatments. *American Economic Review*. Vol.

107, No. 6, pp. 1611-1637.

- Mølland, E. (2016). Benefits from delay? The effect of abortion availability on young women and their children. *Labour Economics*. Vol. 43, pp. 6-28.
- Mondragón y Kalb, M., Ortega, A. A., Velazquez, J. M., Olavarrieta, C. D., Rodríguez, J. V., Becker, D. and García, S. G. (2011). Patient Characteristics and Service Trends Following Abortion Legalization in Mexico City, 2007-10. *Studies in Family Planning*. Vol. 42, Issue 3.
- Mooney Marini, M. (1984). Women's Educational Attainment and the Timing of Entry into Parenthood. *American Sociological Review*. Vol. 49, No. 4, pp. 491-511.
- Mott, F. L. and Marsiglio, W. (1985). Early Childbearing and Completion of High School. *Family Planning Perspectives*. Vol. 17, No. 5, pp. 234-237.
- OECD. (2013). Education Policy Outlook - Mexico. Technical Report. Available Online at: [http://www.oecd.org/education/EDUCATION%20POLICY%20OUTLOOK%20MEXICO\\_EN.pdf](http://www.oecd.org/education/EDUCATION%20POLICY%20OUTLOOK%20MEXICO_EN.pdf) (Accessed on 2019-04-29).
- OECD. (2014). Education at a Glance - Mexico. Technical Report. Available online at: <http://www.oecd.org/education/Mexico-EAG2014-Country-Note.pdf> (Accessed on 2019-04-29).
- Pop-Eleches, C. (2006). The Impact of an Abortion Ban on Socioeconomic Outcomes of Children: Evidence from Romania. *Journal of Political Economy*. Vol. 114, No. 4.
- Pop-Eleches, C. (2010). The Supply of Birth Control Methods, Education and Fertility: Evidence from Romania. *Journal of Human Resources*. Vol. 45, No. 4, pp. 971-997.
- Oreffice, S. (2007). Did the legalization of abortion increase women's household bargaining power? Evidence from labor supply. *Review of Economics of the Household*. Vol. 5, Issue 2. pp. 181-207.
- Ribar, D. (1994). Teenage Fertility and High School Completion. *Review of Economics and Statistics*. Vol. 76, No. 3, pp. 413-424.
- Romano, J. P., Shaikh, A. M., and Wolf, M. (2010). Hypothesis Testing in Econometrics. *Annual Review of Economics*. Vol. 2, pp 75-104.
- Schiavon, R., Collado, M. E., Troncoso, E., Sánchez, J. E. S., Zorrilla, G. O., and Palermo, T. (2010) Characteristics of private abortion services in Mexico City after

legalization. *Reproductive Health Matters*. Vol 18, pp. 127-135.

Singh, S., Remez, L., Sedgh, G., Kwok, L., and Onda, T. (2018). *Abortion Worldwide 2017: Uneven Progress and Unequal Access*. *Guttmacher Institute*.

The Guardian. (2019). Alabama Abortion Ban: Republican State Senate Passes Most Restrictive Law in the US. Available online: <https://www.theguardian.com/us-news/2019/may/14/abortion-bill-alabama-passes-ban-six-weeks-us-no-exemptions-vote-latest> (Accessed on 2019-05-26).

United Nations. (2019). Sustainable Development Goals. Goal 3: Ensure health lives and promote well-being for all at all ages. Available online: <https://www.un.org/sustainabledevelopment/health/> (Accessed on 2019-05-06).

Verbeek, M. (2008). Chapter 11, Pseudo-Panels and Repeated Cross-Sections in L. Mátyás and P. Sevestre (eds.) *The Econometrics of Panel Data*. Springer-Verlag Berlin Heidelberg, pp. 369-383.

WHO. (2012). Unsafe abortion incidence and mortality. Information sheet. Available online: [https://apps.who.int/iris/bitstream/handle/10665/75173/WHO\\_RHR\\_12.01\\_eng.pdf;jsessionid=51DFB8D2789033876ED2015D78AAAD93?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/75173/WHO_RHR_12.01_eng.pdf;jsessionid=51DFB8D2789033876ED2015D78AAAD93?sequence=1) (Accessed on 2019-05-07).

# Appendix

*Table A 1: Regressive legislative changes after the ILE reform in Mexico City*

<b>State</b>	<b>Reform Date</b>
Baja California	2008 - Dec 26
Chiapas	2009 - Jan 20
Chihuahua	2008 - Jun 21
Colima	2009 - Nov 25
Durango	2009 - May 31
Guanajuato	2009 - May 26
Jalisco	2009 - July 02
Morelos	2008 - Dec 11
Nayarit	2009 - Jun 06
Oaxaca	2009 - Sep 11
Puebla	2009 - Jun 03
Querétaro	2009 - Sep 18
Quintana Roo	2009 - May 15
San Luis Potosi	2009 - Sep 02
Sonora	2009 - Apr 06
Tamaulipas	2009 - Dec 23
Yucatán	2009 - Aug 07
Veracruz	2009 - Nov 17

(Source: Clarke & Mühlrad, 2018)

*Table A 2: Difference-in-Differences Estimates of Legal Reforms on Labour Force Participation, Heterogeneous Effects, No Control for Spill-over Effects*

VARIABLES	(1) 15-19 years	(2) 20-24 years	(3) 25-29 years	(4) 30-34 years	(5) 35-39 years	(6) 40-44 years
Post ILE reform	-0.00139 (0.00388)	-0.00824 (0.00746)	0.0326*** (0.00575)	0.0114* (0.00630)	-0.00655 (0.00600)	-0.00420 (0.00586)
Post Regressive Law Changes	0.000422 (0.00724)	0.00548 (0.00630)	0.00618 (0.0101)	-0.0128* (0.00752)	0.00250 (0.00634)	0.00870 (0.00783)
Constant	0.0882*** (0.0149)	0.385*** (0.0218)	0.533*** (0.0197)	0.482*** (0.0220)	0.494*** (0.0222)	0.517*** (0.0216)
Observations	1,058,391	981,857	860,892	827,780	825,422	791,345
Mean of dependent variable	0.204	0.426	0.538	0.553	0.570	0.585
State, time and age FE	Yes	Yes	Yes	Yes	Yes	Yes
State-level controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on the extensive margin of female labour force participation for different age cohorts. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Table A 3: Difference-in-Differences Estimates of Legal Reforms on Hours Worked Per Week, Heterogeneous Effects, No Control for Spill-over Effects.*

VARIABLES	(1) 15-19 years	(2) 20-24 years	(3) 25-29 years	(4) 30-34 years	(5) 35-39 years	(6) 40-44 years
Post ILE reform	0.577*** (0.166)	0.117 (0.328)	1.673*** (0.225)	1.065*** (0.263)	0.718*** (0.234)	0.435* (0.226)
Post Regressive Law Changes	-0.233 (0.190)	0.436 (0.258)	0.369 (0.394)	-0.861** (0.341)	-0.216 (0.280)	-0.0966 (0.349)
Constant	4.114*** (0.544)	17.02*** (1.018)	22.91*** (0.780)	19.90*** (0.872)	20.56*** (0.810)	20.94*** (0.838)
Observations	1,058,391	981,857	860,892	827,780	825,422	791,345
Mean of dependent variable	7.031	16.46	20.61	20.55	20.97	21.42
State, time and age FE	Yes	Yes	Yes	Yes	Yes	Yes
State-level controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on the intensive margin of female labour force participation (average number of hours worked per week), for different age cohorts. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Table A 4: Difference-in-Differences Estimates of Legal Reforms on the Extensive Margin of Labour Supply, Only Urban Areas with >100 000 Inhabitants.*

VARIABLES	(1) labour supply	(2) labour supply	(3) labour supply
Post ILE reform	0.00867*** (0.00307)	0.00302 (0.00452)	0.00164 (0.00479)
Post Regressive Law Changes	-0.00702 (0.00414)	-0.00754* (0.00438)	-0.00771* (0.00440)
Constant	0.0568*** (0.0101)	0.0355** (0.0167)	0.0352** (0.0167)
Observations	3,192,716	3,192,716	3,192,716
Mean of dependent variable	0.506	0.506	0.506
State, time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on female labour force participation. The sample is restricted to urban areas with more than 100 000 inhabitants. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Table A 5: Difference-in-Differences Estimates of Legal Reforms on the Extensive Margin of Labour Supply, Only Urban Areas with >15 000 Inhabitants.*

VARIABLES	(1) Labour supply	(2) Labour supply	(3) Labour supply
Post ILE reform	0.00783** (0.00304)	0.00323 (0.00422)	0.00155 (0.00440)
Post Regressive Law Changes	-0.00597* (0.00329)	-0.00681* (0.00341)	-0.00704** (0.00340)
Constant	0.0671*** (0.00869)	0.0498*** (0.0162)	0.0494*** (0.0162)
Observations	3,841,225	3,841,225	3,841,225
Mean of dependent variable	0.501	0.501	0.501
State, time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on female labour force participation. The sample is restricted to urban areas with more than 15 000 inhabitants. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Table A 6: Difference-in-Differences Estimates of Legal Reforms on the Intensive Margin of Labour Supply, Only Urban Areas with >100 000 Inhabitants.*

VARIABLES	(1) Hours worked last week	(2) Hours worked last week	(3) Hours worked last week
Post ILE reform	0.711*** (0.0972)	0.678*** (0.174)	0.666*** (0.183)
Post Regressive Law Changes	-0.430** (0.206)	-0.384* (0.203)	-0.386* (0.204)
Constant	1.611*** (0.221)	1.829** (0.667)	1.826** (0.668)
Observations	3,192,716	3,192,716	3,192,716
Mean of dependent variable	19.15	19.15	19.15
State, time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on female labour force participation average number of hours worked per week. The sample is restricted to urban areas with more than 100 000 inhabitants. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Table A 7: Difference-in-Differences Estimates of Legal Reforms on the Intensive Margin of Labour Supply, Only Urban Areas with >15 000 Inhabitants.*

VARIABLES	(1) Hours worked last week	(2) Hours worked last week	(3) Hours worked last week
Post ILE reform	0.655*** (0.0994)	0.676*** (0.160)	0.655*** (0.172)
Post Regressive Law Changes	-0.398** (0.165)	-0.372** (0.161)	-0.375** (0.161)
Constant	1.904*** (0.228)	2.359*** (0.602)	2.354*** (0.604)
Observations	3,841,225	3,841,225	3,841,225
Mean of dependent variable	18.92	18.92	18.92
State, time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on female labour force participation average number of hours worked per week. The sample is restricted to urban areas with more than 15 000 inhabitants. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Table A 8: Difference-in-Differences Estimates of Legal Reforms on the Extensive Margin of Male Labour Supply.*

VARIABLES	(1) Labour supply	(2) Labour supply	(3) Labour supply
Post ILE reform	-0.000465 (0.00140)	-0.00379** (0.00156)	-0.00430*** (0.00156)
Post Regressive Law Changes	0.00385 (0.00360)	0.00117 (0.00348)	0.00110 (0.00348)
Constant	0.260*** (0.0162)	0.274*** (0.0173)	0.274*** (0.0173)
Observations	4,918,770	4,918,770	4,918,770
Mean of dependent variable	0.760	0.760	0.760
State time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on the extensive margin of male labour force participation. The sample is restricted to men between 15 and 44 years. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Table A 9: Difference-in-Differences Estimates of Legal Reforms on the Intensive Margin of Male Labour Supply.*

VARIABLES	(1) Hours worked last week	(2) Hours worked last week	(3) Hours worked last week
Post ILE reform	0.0729 (0.133)	0.225 (0.167)	0.181 (0.175)
Post Regressive Law Changes	0.219 (0.243)	0.170 (0.244)	0.164 (0.246)
Constant	10.82*** (0.712)	13.19*** (0.947)	13.19*** (0.955)
Observations	4,918,770	4,918,770	4,918,770
Mean of dependent variable	34.31	34.31	34.31
State time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on the intensive margin of male labour force participation, average number of hours worked per week. The sample is restricted to men between 15 and 44 years. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Table A 10: Robustness Test - Difference-in-Differences Estimates of Legal Reforms on the Extensive Margin of Labour Supply for Women Aged 45-65 Years.*

VARIABLES	(1) Labour supply	(2) Labour supply	(3) Labour supply
Post ILE reform	0.00909** (0.00404)	0.00779 (0.00620)	0.00788 (0.00659)
Post Regressive Law Changes	0.00839 (0.00910)	0.00711 (0.00896)	0.00712 (0.00897)
Constant	0.465*** (0.00526)	0.463*** (0.0181)	0.463*** (0.0181)
Observations	2,219,153	2,219,153	2,219,153
Mean of dependent variable	0.455	0.455	0.455
State, time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on female labour force participation. The sample is restricted to women between 45 and 65 years. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure.

*Table A 11: Robustness Test - Difference-in-Differences Estimates of Legal Reforms on the Intensive Margin of Labour Supply for Women Aged 45-65 Years.*

VARIABLES	(1) Hours worked last week	(2) Hours worked last week	(3) Hours worked last week
Post ILE reform	0.703*** (0.132)	0.906*** (0.234)	0.879*** (0.243)
Post Regressive Law Changes	0.185 (0.371)	0.203 (0.379)	0.200 (0.379)
Constant	17.80*** (0.166)	19.14*** (0.780)	19.13*** (0.783)
Observations	2,219,153	2,219,153	2,219,153
Mean of dependent variable	16.05	16.05	16.05
State, time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on female labour force participation, average number of hours worked per week. The sample is restricted to women between 45 and 65 years. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Table A 12: Robustness Test - Difference-in-Differences Estimates of Legal Reforms on the Completion of High School for Young Men Aged 18-25 Years.*

VARIABLES	(1) Completed high school	(2) Completed high school	(3) Completed high school
Post ILE reform	-0.0376*** (0.00306)	-0.0363*** (0.00316)	-0.0356*** (0.00345)
Post Regressive Law Changes	-0.00810* (0.00433)	-0.00780* (0.00435)	-0.00770* (0.00433)
Constant	0.445*** (0.00707)	0.453*** (0.0101)	0.453*** (0.0101)
Observations	1,532,214	1,532,214	1,532,214
Mean of dependent variable	0.347	0.347	0.347
State time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on high school completion for young men between 18-25 years. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Table A 13: Robustness Test - Difference-in-Differences Estimates of Legal Reforms on Years of Schooling for Young Men Aged 18-25 Years.*

VARIABLES	(1) Years of schooling	(2) Years of schooling	(3) Years of schooling
Post ILE reform	-0.123*** (0.0334)	-0.106*** (0.0300)	-0.103*** (0.0351)
Post Regressive Law Changes	-0.0490 (0.0371)	-0.0448 (0.0369)	-0.0445 (0.0368)
Constant	9.176*** (0.0560)	9.250*** (0.0769)	9.251*** (0.0766)
Observations	1,530,549	1,530,549	1,530,549
Mean of dependent variable	10.68	10.68	10.68
State time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on years of schooling for young men between 18-25 years. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Table A 14: Robustness Test - Difference-in-Differences Estimates of Legal Reforms on the Completion of High School for Older Women Aged 45-65 Years.*

VARIABLES	(1) Completed high school	(2) Completed high school	(3) Completed high school
Post ILE reform	0.000323 (0.00155)	0.000948 (0.00155)	0.00184 (0.00156)
Post Regressive Law Changes	-0.000178 (0.00152)	-3.92e-05 (0.00154)	7.58e-05 (0.00157)
Constant	-0.0184*** (0.00617)	-0.0146** (0.00677)	-0.0144** (0.00671)
Observations	9,063,863	9,063,863	9,063,863
Mean of dependent variable	0.176	0.176	0.176
State time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on high school completion for old women between 45-65 years. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Table A 15: Robustness Test - Difference-in-Differences Estimates of Legal Reforms on Years of Schooling for Older Women Aged 45-65 Years.*

VARIABLES	(1) Years of schooling	(2) Years of schooling	(3) Years of schooling
Post ILE reform	-0.0651*** (0.0201)	-0.0302 (0.0221)	-0.0376* (0.0218)
Post Regressive Law Changes	-0.0266 (0.0285)	-0.0176 (0.0264)	-0.0185 (0.0263)
Constant	7.443*** (0.146)	7.632*** (0.143)	7.630*** (0.143)
Observations	9,050,768	9,050,768	9,050,768
Mean of dependent variable	9.300	9.300	9.300
State time and age FE	Yes	Yes	Yes
State-level controls		Yes	Yes
Mexico State control			Yes

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on years of schooling for old women between 45-65 years. Sample weights are used, and standard errors are clustered at the state level and calculated using a wild bootstrap procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1