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The Choice of Effective Contraception for Women in Latin America: Inspecting the Role of Education, Empowerment and Religious Affiliation

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Abstract: This paper studies the relationship between contraceptive adoption by women and three relevant predictors: women's education, empowerment and religious affiliation. I employ recent information on women's characteristics and the institutional environment for six Latin American countries, in the years 2013-2015, to perform a cross-section analysis with binary and multinomial logistic regressions, having contraception use and contraception effectiveness as outcome variables. I find that women who are more educated and more empowered have higher odds of using contraception, compared to women with lower educational attainment and autonomy. Being affiliated to Christian confessions halves women's odds of using contraception, compared to the odds of women who do not identify as affiliated with either Catholicism of Protestantism. The same association holds between the predictors and the use of more effective methods, compared to no method. However, education, empowerment and no affiliation to the Church increment the odds of using less effective contraception at the same pace as they do with more effective contraception, suggesting that the explanatory variables affect contraception use more powerfully than contraception effectiveness.

Key words: Contraceptive use, Contraceptive Effectiveness, women, education, empowerment, religion, Latin America

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1. Introduction

In the last two centuries, changes in economic growth, social relations and reproductive behaviour have shaped the significant reduction in fertility levels that changed demographic patterns in many areas of the World. Among these, Latin America and the Caribbean, a region comparable to developing economies in many fields, but held back in its catching up process by persistent poverty and inequality, is an interesting case to study (Gayet, Juarez & Bozon, 2013). Considering Latin America as a whole, Gayet and co-authors (2013) noted how fertility levels went through a rapid reduction in the second half of the twentieth century, with the Total Fertility Rate (TFR) moving from 5.9 children per woman in 1950, on average, to 2.15 children per woman in 2012, on average. Looking at these figures, one may draw the conclusion that fertility dynamics are completely under control in Latin America. However, as they claim, such progresses have not been uniform within the region, nor within different social classes in the same country. While more advanced economies like Brazil, Chile, Costa Rica and Cuba, have rapidly moved past the first demographic transition, reaching below-replacement-level fertility rates in a few decades, countries like Bolivia and Haiti still present TFRs well above 3. Supporting these facts, some authors suggest that fertility decline even stalled in various countries in the late nineties (Bongaarts, 2008). In Latin America, this happened in the cases of the Dominican Republic first, and Guatemala in the following decade.

One true statement, shared by literature, is that Latin American citizens desire smaller families. In other words, they want less children, regardless of country and social status (Cavenaghi & Alves, 2009). Bearing this into account, the mass increase in fertility control experienced by developing countries in the past decades plays an essential role in adjusting wanted fertility to the actual one, and Latin America in no exception. Knowledge of contraceptive methods is now almost universal in Latin America and the Caribbean (Cavenaghi & Alves, 2009). However, strong inequality in opportunities, resistance to family planning programs from conservative parties, and psychological barriers like ignorance, societal disapproval, and strong submission of women in the household, constrain their use. As a consequence of these barriers, the region suffers from very high rates of not wanted or mistimed pregnancies, resulting in dangerous and often illegal induced abortions (Singh, Remez, Sedgh, Kwok & Onda, 2018).

The aim of this paper is to find the association between women's choices in terms of contraceptive use and effectiveness and women's individual characteristics, in six Latin American countries: Colombia, Dominican Republic, Guatemala, Haiti, Honduras and Peru. Selecting women as decision-makers when it comes to fertility regulation decisions is a meaningful choice for Latin America. In fact, in the region, the strong gender inequality, combined with the lack of public

information on contraceptive reliability, and the folkloric beliefs on “machismo”, make it so that the responsibilities for reproduction, together with its monetary and psychological costs, are passed down to women (Cavenaghi & Alves, 2009).

The theoretical framework at the base of this work sees fertility decisions modelled as in a consumer maximization problem, where women choose the optimal level of protection balancing marginal costs and benefits. For this particular study, three individual variables, fitting both theoretical reasoning on fertility and empirical literature on Latin America and the Caribbean were introduced in the base model: Education, women Empowerment, and Religious affiliation. The effects of women’s education on her propensity to use contraception, and in particular, more effective contraception (represented by Intra-Uterine Devices, Injections and the more famous contraceptive Pill), has been the subject of numerous studies (Cochrane, 1979; Jejeebhoy, 1995; Stanfors & Larsson, 2014). Higher levels of education provide women with better job opportunities, increasing the opportunity cost of women’s time, and higher income, decreasing relative contraception costs. In addition, education endows women with more knowledge, lowering non-monetary costs of contraception and defying taboos and false beliefs towards sexual relationships.

While education is of primary importance in studies on contraceptive use in Africa, as schooling is the main channel of communication between international agencies promoting family planning and the population, the situation might be different for Latin America. Here, though schooling remains of central importance in determining women’s contraceptive use, two additional dimensions have to complement the analysis: female empowerment and religion. In fact, education empowers women to a certain extent, depending on the role of contextual factors. There are countries in Latin America where women are highly educated, but do not have the chance to go out of their houses, or suffer from domestic violence in a way that it impedes their physical and decisional autonomy (Gayet, Juarez & Bozon, 2013). In such countries, where gender inequality seems structural and violence against women is common, a proper index measuring female autonomy within their household complements the positive association between education and contraceptive use (Casique, 2001). In fact, women’s position in the household depends not only on her education, but on social structures (Blanc, 2001). And social structures that allow men’s dominance over women reduce their choices when spouses’ preferences towards fertility differ, creating a barrier to demographic change. This paper aims at showing that more autonomous women use contraception significantly more than less empowered ones.

Finally, cultural practices influence fertility control by indoctrinating women on the “right” decisions to make over their own procreation. In Latin America, the strong influence of the

Christian Church, which prohibits any type of fertility regulation that is not natural, is definitely a factor worth considering (Srikanthan and Reid, 2008).

The question this paper wants to address is double. Exploiting the variation among countries at different stages of the fertility transition, I want to investigate to which extent education, empowerment and religious affiliation influence women's choices (i) of using any fertility control, compared to no method and (ii) if more educated, empowered and less indoctrinated women choose more effective contraceptive methods. Latin America also offers an interesting institutional setting. In many countries, governments have no role in shaping family planning policies, and this has repercussions on women's access to effective methods of contraception. For this reason, bringing together personal and vertically-imposed characteristics, I added country-level indicators of State openness towards family planning, adding a national perspective to this individual-level analysis.

In order to perform my analysis, I used the last wave of Demographic and Health Surveys, collected between 2013 and 2015, for each of the six countries mentioned above. Studying six countries at different stages of the fertility transition, with different levels of education and different cultures, offers an interesting case of comparison, updating a literature on fertility control that is scarce for Latin America. Exploiting these micro-level and country-level data, I ran stepwise (binary and multinomial) logistic regressions having contraceptive use and contraceptive effectiveness as categorical outcome variables. This strategy allows me to comment my results in terms of odds ratios, representing, in the binomial case, the ratio between the probability of using contraception and not using it, being exposed to changes in the predictor variables.

In line with literature and theory, I found positive relationships between contraception use and education and empowerment, and a negative relationship with Christian affiliation. Interestingly my variables of interest revealed to be stronger predictors of contraceptive use, compared to contraceptive effectiveness. As discussed in the following sections this may relate with structural inequality and scarce government intervention.

This paper is organised in the following way. Section 2 offers a background on fertility dynamics and contraception use in Latin America and the Caribbean. Section 3 examines the theoretical framework and proposes predictions for the empirical analysis. Section 4 explores relevant literature on education, empowerment, religion and institutional characteristics shaping contraception use for women. Section 5 presents data collected from the Demographic and Health Surveys, the PARLINE Database of National Parliaments and the Centre for Reproductive Rights' World Abortion Laws Map. Section 6 exposes the estimation strategy used to perform my empirical analysis. Section 7

comments the estimation results, while Section 8 critically discusses how they relate to theory predictions and previous empirical research. The final section concludes.

2. Fertility and contraception use in Latin America

Latin America and the Caribbean is a vast region constituted by 54 countries, ranging from large continental economies like Brazil, to small oceanic islands like Puerto Rico. Though a certain homogeneity is generally associated with the region, sexual culture and fertility trends have varied consistently among countries in the last century (Gayez, Juarez & Bozon, 2013). Within the area, similarities and differences in socio-economic and cultural drivers of fertility behaviours can be spotted, and are most evident if we divide the region in Caribbean, Central America and South America. Starting with the similarities, some countries, for example, share the same pre-Colonial Past – as Central American economies with the Mayan society -; other were colonized by Iberian countries in the Middle Ages; more recently, some have developed strong geopolitical ties (Casique, 2001). In addition, almost every Latin American economy is under the influence of Christianism, with Roman Catholicism and Protestantism as its principal manifestations.

Looking at demographic processes, fertility declined sharply in the majority of countries starting from 1960, together with exceptional improvements in education but also higher inequality and poverty, a structurally high prevalence of violence against women, and record-setting rates of illegal abortions (Guzman, Rodriguez & Martinez, 2006). The fast decrease in fertility experienced in the last decades in Latin America is due to the fact that women desire smaller families. At the same time, differently from more developed economies, no changes in age at first child have been observed, creating a fertility pattern characterised by a large number of teenage pregnancies and higher use of contraception or female sterilization after the desired number of children has been reached (Stern, 2012). The reason for such early pregnancies lies in the fact that sexual initiation for Latin American women remains strongly associated with marriage and unions, which both happen very early in Latin American women's lives. In some extreme cases, like in the Dominican Republic, 80% of single women report not having had sexual relationships (Guzman, Rodriguez & Martinez, 2006). Though social stigma could bias reporting, such high figures, combined with young age at first union and children, reveal a pattern that is different compared to the one that brought Western countries to lowest-low levels of fertility, characterized by postponed marriage and family creation.

The diffusion of more effective contraceptive methods - like the Pill, Intra-Uterine Devices and periodical Injections – definitively separated sexual experience from its reproduction consequences in countries whose individuals and institutions were ready. Conversely, economies with less

educated and empowered women, who also happened to have governments not supportive of family planning methods, lagged behind (Di Cesare, 2007). Some countries thus continued their catching up process towards more modern economies in terms of human development, while others staggered, held back by lower education, social beliefs isolating women, and limited or absent government intervention in family planning. Currently, two poles seem to have developed in the region: one has a short reproductive window and high use of more effective methods at an older age, like in Colombia and Dominican Republic. The other has longer reproductive spans and lower use of effective contraception, like in Haiti (Gayez, Juarez and Bozon, 2013).

It is relevant to study Latin America because of its high unmet need for contraception. As defined by Westoff (1988), unmet need is found among women who do not use contraception, but are capable of conceiving and, in fact want to avoid the risk of another pregnancy, or at least postpone it. The search for determinants of contraceptive use at the centre of this paper is aimed at proposing areas that have room for improvement and may increase contraceptive use among women who are at risk of unwanted pregnancies. Indeed, data on this variable is alarming. For example, a study on Haiti found that 37% of young women had unmet need for contraception (Singh et al., 2018). Such discomfort has two record-breaking consequences for Latin American women, even compared to Africa. First, the high rate of unintended pregnancies, accounting for not wanted, not planned or mistimed pregnancies, which reached 96 per 1000 cases in the region in 2014, compared to a global average of 55 per 1000. Second, the consequent abortion rate, in continuous increase in the region, counting 44 abortions for every 1000 pregnancies in 2014, compared to the 29 per 1000 in Africa and the 28 per 1000 in Asia (Singh et al., 2018).

Separating our region in Caribbean, Central America and South America makes it possible to identify the most critical situations. The abortion rate is high for the Caribbean (59 per 1000) and South America (48 per 1000), while it is more limited in the richer, more progressive Central America (33 per 1000). In numbers, out of the fourteen million pregnancies that were unintended in 2014 in Latin America and the Caribbean, almost half ended in abortion (Singh et al., 2018).
One last worrying fact is that only 3% of women live in areas where abortion is permitted with no restriction, causing all these unintended pregnancies to end up in dangerous and illegal induced abortions. Of course, the worst consequences in terms of health are suffered in poorer countries, and within countries, by poor women in rural areas (Singh et al., 2018). The fact that these figures are so high, together with the fact that women's preferences are for smaller families, pushes for policy intervention, which is scarce in Latin America compared to Africa, and for a radical change in structural inequality suffered by women in Latin America. Differences in fertility, contraception use,

education, gender systems, religion affiliation, abortion laws and propensity of government to enter family planning policies differ between the six countries selected for this study. In fact, it might be the case that they are at different levels of the demographic transition towards lowest-low levels of fertility. And photographing them at the same time, looking at the last data available from the Demographic and Health Surveys provides an addition to the current literature on contraception use, that has been scarce in Latin America in the last two decades.

3. Theoretical considerations: An economic framework for fertility

This study, which seeks to find determinants of women's decisions on contraception use and effectiveness, has its theoretical bases in Becker and Easterlin's economic theories of fertility (Becker, 1960; Easterlin, 1975). Moving past the Malthusian framework and psychological theory, Becker paved the way for modelling fertility behaviours and demand for children, using an economic decision-making framework. The spread of knowledge, as well as the use, of contraception methods, compared to an era where control over births could only be secured through abstinence and abortion, motivated him to study the decision-making dynamics behind fertility.

3.1 Fertility: a utility maximization problem

In Becker's model, children are considered *"durable production and consumption goods"*. Indeed, for a long period of time, children provide satisfaction to their parents – similarly to consumption goods – and monetary income, as well as services to the household – as in the case of production goods. Commenting on Becker's model, Robinson (1997) defined children as a special type of capital goods: after the initial costs of procurement and maintenance in the first years, they start producing benefits for their parents for the rest of their lives, the quality and quantity of these benefits depending on the "technology" they are endowed with. Either way, considering children as a particular type of commodity made it possible to analyse the demand for children in a way that resembled the Consumer Demand Theory.

Following the famous reasoning, parent's fertility choices are the result of a maximization problem, taken into account their preferences, incomes and the costs of having children (Becker, 1960). Let us consider the household as the base decisional unit for fertility choices. When it comes to having children, couples go through a decision process, and balance utility against disutility at the margin - i.e. at any additional child - to decide whether one more child is wanted or not. In the household, this decision is inevitably linked to all the economic processes taking place there, like work and consumption, for example. In this demand model, people in the household want to maximise their utility, given both budget and time constraints. Bearing this in mind, they will choose their

equilibrium allocation of time and money for every good and activity, included the ones to dedicate to children (Becker, 1960).

To sum up, treating a child as a commodity to invest in, as with other goods, has two theoretical consequences. First, when considering fertility as a decision of its own, the optimal level of children will be reached when the marginal benefits of having them equal the marginal costs. Second, relating this decision to the other economic processes developing in the household creates a trade-off between an additional birth and the possibility to buy other goods and services. Both points introduce in theory the element of fertility control, which is the focus of this study: if a marginal increase in children, i.e. one more birth, reduces the household utility, parents will act in order to reduce the probability of having other children, for example, by using contraception.

Easterlin (1975) enriched the economic framework for fertility with a supply side analysis. In his model, fertility is determined by demand for children, potential output of children, and fertility regulation costs. Demand for children is the quantity of surviving children that parents would want to have if fertility regulation had zero costs. Following the theory of a utility-maximizing household, the determinants of this demand are preferences, income and prices. Ceteris paribus, theory predicts that demand for children will increase with income (if we consider children a normal good), and decrease with their price relative to the one of other goods, similarly as with preferences of other goods over children.

On this matter, various authors have made clear that parents invest both in child quantity and child quality, and that these two are not necessarily substitutes in the household's search for a certain level of benefits, though they respond with different elasticity to changes in income (Robinson, 1997). If we allow for different qualities of children, increases in income are predicted to raise both quantity and quality of children, the former less than the latter. However, a higher price of inputs used for children relative to other goods could trigger a certain substitution between quantity and quality of children (Robinson, 1997).

The potential output of children is the amount of children parents might have if they did not limit fertility voluntarily (Easterlin, 1975). It depends positively on natural fertility and negatively on children mortality. The most important determinants of this potential supply of children are fecundity and frequency of intercourses, which are based on couple's preferences and involuntary events such as illness, and fetal mortality. Though it does not entail any voluntary control of fertility, the potential output of children may depend on cultural factors, including beliefs, taboo and social norms, that involuntarily change patterns of abstinence, fecundity and fetal mortality.

Now, in the case potential output is smaller than demand, there will be no need to limit fertility. As household members will always try to get the closest they can to their preferences, they will have as

many children as possible, so that their final number of children will equal the potential output. The opposite case of excess supply of children may result, instead in unwanted pregnancies, motivating parents to control fertility (Easterlin, 1975). This motivation for contraception, however, is a necessary but not sufficient condition for actual use of fertility regulation. Costs represent an important variable, and are of two kinds: market costs and social and psychological costs. Easterlin (1975) refers to market costs as the money and time needed to access specific methods of contraception, both in terms of knowledge and practical use. He then defines psychic costs as the burden associated with the practice if fertility control itself, influenced by different attitudes towards contraception in different societies. In this context, family planning policies decrease both costs, by making contraception available and legitimating fertility control practices.

3.2 Adapting fertility behaviours theory to the choice of effective contraception

This decision-making framework proposed by Becker for the household can be adapted to the more recent reality, where not only parents choose to limit fertility, but they also decide which method to use. As Michael (1973) pointed out, pioneer studies on fertility control assumed that households could produce without uncertainty the precise number of children desired. However, this is not the case in practice. The number of children a couple has is a random event, which happens with a certain probability, depending on fecundity, frequency of intercourses and contraceptive use. In this sense, what Becker's theory modelled as "if marginal costs of having children exceed marginal benefits, parents decide not to have additional children", needs to develop into a more complex consideration, taking into account the fact that the probability of having an additional child may nevertheless be positive, unless parents decide to control fertility by abstinence. More formally, we can write:

$$p_i = p^*(1 - e_i) \qquad 0 \leq e_i \leq 1$$

Where p_i is the periodical (monthly for example) probability of conceiving, depending positively on p^*, the couple's periodical probability of conceiving without using any fertility control, and negatively on e_i, the effectiveness rate of a certain contraceptive strategy. This last term is influenced by the type of contraceptive chosen and by the diligence with which this method is commonly used. Thus, parents also need to decide their optimal level of contraception use, to protect themselves from more births (Michael, 1973). To avoid unwanted pregnancies, women will resort to more or less effective methods of contraception, depending on what maximises their utility under uncertainty.

Different contraceptive methods will give different probability of unwanted pregnancies. Theoretically, as shown in Levine (2007), higher contraception intensity, as in the case of hormonal

methods, is more effective in decreasing the probability of becoming pregnant. However, such methods - the birth control pill, implants and hormonal intra-uterine devices - are generally associated with higher costs. Some methods bring higher monetary costs, other may influence personal satisfaction, or worsen the physical or psychological health of women. Again, it becomes a problem of optimal level of contraception. The household, and in particular women as we are interested in their decisions, will thus choose their optimal allocation of contraceptive effectiveness, which is found where the marginal cost of having another child equals the marginal cost of increasing contraceptive effectiveness to reduce the likelihood of that additional child. The dynamics of contraceptive costs and benefits are better described in Figure 1.

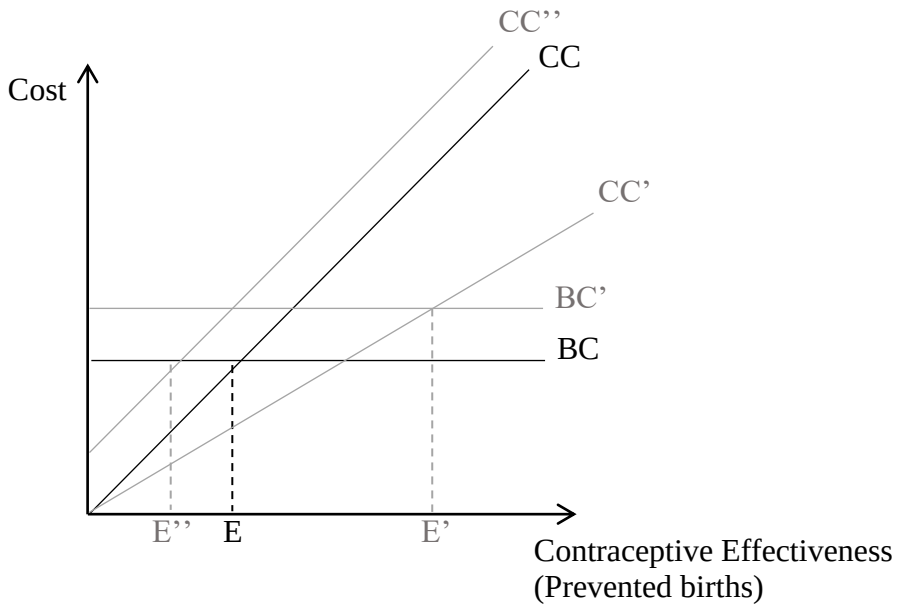

Figure 1. Contraception Benefits and Costs

In the Figure above, the curve CC is a simplified version of Contraceptive Costs. If we were to distinguish between more traditional methods, like withdrawal, and more modern methods, like implants, there would be two different cost curves. As explained in Michael (1973), older techniques have zero fixed costs and quite high marginal costs. More modern techniques have instead higher initial fixed costs, but lower marginal costs, i.e. they would start at a higher point on the Y-axis, but with a less steep slope. This way, though the initial costs of accessing more effective contraception are higher, if women want to avoid births with higher probability they will choose highly effective methods. However, for simplicity, I will only represent one cost curve, with the aim of showing how optimal contraceptive choices are reached in a typical cost-benefit analysis.

Curve BC represents birth costs. Considering the two curves, women will choose if and how effectively they will protect themselves from pregnancy. The optimal level is reached when the marginal cost of having a child is equal to the marginal cost of reducing the odds of becoming

pregnant using more effective contraception (point E). Any change reducing fixed and marginal costs of more effective contraception, i.e. moving CC down, will increase the equilibrium level of contraceptive effectiveness. For example, better information on more effective contraception decreases marginal costs of adopting them, so that women will increase their levels of contraceptive use. In the same way, higher monetary or opportunity costs of births, i.e. moving BC up, will increase women's will to reduce the probability of having another child, pushing her to adopt more effective contraception. For example, a lower disapproval for low fertility from the community, as well as higher education changing occupational status for women, will result in bigger opportunity costs of having children, thus calling for more effective contraception.

3.3 Determinants of contraceptive effectiveness

On the individual level, I will look at three determinants of effective contraception use: education, women empowerment and religion. These three explanatory variables can be positioned within the cost-benefit economic framework of fertility presented above.

3.3.1 A prediction for education

Multiple studies have proven that women's education is a determinant factor shaping their fertility (Cochrane, 1979; Jejeebhoy, 1995; Stanfors & Larsson, 2014). Following this literature, I will argue that education – measured in levels - is positively correlated with women's ability to limit births through contraception. Looking at theory, education may influence the demand side, the supply side and preferences towards children, through multiple mechanisms.

On the demand side, education might provide women with better job opportunities and higher income, which has two effects in terms of optimal contraceptive choice (Stanfors & Larsson, 2014). First, it increases the opportunity cost of their time, bringing the BC curve in Figure 1 up. Second, it decreases relative contraception costs, making the curve CC in Figure 1 less steep. Both movements go in the same direction, so that, looking at demand, higher levels of education are correlated with higher use of more effective contraception (new equilibrium in E'). On the supply side, if we consider the fact that fertility is also explained by women's culture and psychology, we might think that education, by endowing women with more knowledge on fertility control, lowers non-monetary costs of contraception (Easterlin, 1975). In addition, higher education fosters higher ability of taking care of children in the first period of their lives, reducing infant mortality. As a consequence, the higher number of surviving children increases the probability of an "excess supply" situation, as described in Easterlin's model. The lowered need for child replacement increases the costs of an additional child, thus motivating women to use contraceptive methods to limit their surviving offspring (Caldwell, 1982). Finally, education has an impact on preferences and attitudes towards

fertility control. Higher education may in fact shift women's indifference curves to a point where the costs of having other babies increase, so that they desire less children. Having explored this literature, I formulate the first prediction for my analysis in Latin America.

Prediction 1: In the six economies considered, higher levels of education are positively correlated with contraception use. In other words, women with higher levels of education have higher odds of using contraception, compared to other women. Moreover, a higher level of education corresponds to higher use of more effective methods.

It is worth noting that, as going from one level of education, say primary, to a higher one, secondary, has a threshold effects in human capital formation and fertility choices, the analysis will use education levels instead of education years as explanatory variable (Bongaarts, 2003).

3.3.2 A prediction for empowerment

Together with education, women's position in society represents a fairly studied determinant of women's contraception use. Many studies find that women's autonomy – or empowerment – is a channel through which education has an effect on contraception use. Following Jejeebhoy (1995), more educated women (i) have better access to reproductive health services, (ii) have more control over economic resources, which gives them more bargaining power in household decisions, (iii) have the ability to move around outside their homes and interact within their community (iv) are better at intimate communication with their spouses, which allows them to express their opinion on family planning, and (v) have a wider knowledge allowing them to decide what is better for them in terms of adoption and continuate use of contraception.

However, especially in the case of Latin America, dynamics between genders in the household are not only a matter of education. In fact, though education rates are higher than other developing economies in the entire region, women's empowerment is threatened by high rates of violence against women and structural inequality between the genders (Patrikar, Basannar & Sharma, 2014). Gender-based power imbalances within a household reduce spousal communication about reproduction, compromising women's ability to decide about her own reproductive life. Education does influence empowerment, but it does so until a certain point, providing us with the motivation to study the role of women's position in the household as a separate indicator of contraception use.

Here, I define women's autonomy as the ability to obtain the information necessary to decide about matters that are important to her or the people surrounding her (Dyson & Moore, 1983). Along this discussion, I will use the phrases "women's empowerment", "women's autonomy" and "women's position in the household" as synonyms. They all indicate women's capacities to exploit

information to make independent choices. The empirical indicator used to do so measures how many "decisions" in the household she takes part into.

Similarly to education, women's empowerment influences fertility control preferences, demand and supply. Looking at the former, the fact that a woman is submitted to her husband may bring her preferences towards children to align with his, resulting in higher desire for children compared to a woman who decides more independently (Patrikar, Basannar & Sharma, 2014). Looking at demand, being less responsible for decisions that her husbands may bring women's psychological costs of contraception up. In other words, having no access to either the right information or the possibility to use that information to make autonomous decisions on contraceptive use constitutes an additional ceiling for submissive women. Looking again at Figure 1, inequality between genders influences the intercept of curve CC, increasing it and making it more difficult for women to use more effective protection (new equilibrium in E''). Finally, looking at the supply side, more independent women may have children later because they tend to marry later. Following this theory, I formulate the following prediction.

Prediction 2: Ceteris paribus, women's empowerment is positively correlated with their fertility control choices: the higher the number of decisions they participate in within their household, the higher the odds of contraceptive use, compared to less empowered women. Moreover, higher decisional autonomy in the household increases the use of more effective contraceptive methods.

3.3.3 A prediction for religious affiliation

The last individual determinant of contraception use is religion. In this study, I will focus on religious affiliation, with the purpose of exploring the relationship between following a certain Church's teachings and contraceptive use. No considerations will thus be drawn on religiosity, which includes a more spiritual sense of belonging, morals and beliefs. Being affiliated to a religion imposes non-monetary costs influencing the demand for fertility control (Easterlin, 1975). The disapproval of contraception use by a Church's doctrine may impose psychological costs to women, which will tend not to use any method (Srikanthan & Reid,2008).

Studying Latin America, a focus on Christianity is fundamental. For the Catholic Church, the most followed in Latin America, sexual intercourse in a marriage has the only purpose of procreation (Tobin, 2010). Contraception, which impedes the conception of a new life, is thus banned. Only a few "natural" forms of family planning, like abstinence and rhythm methods, have been recently allowed. An even more strict disapproval is the one promoted by the increasingly popular Protestant Church, especially in Central America. Its more conservative leaders stay true to the Bible's command "Be fruitful and multiply", promoting procreative marriages. Violating Christian precepts

on the use of contraceptive methods represents a *una tantum* cost, meaning that fixed costs of using forbidden techniques are higher for women affiliated to a Church, compared to women who are not (Michaels, 1973). Looking at Figure 1, this means that the intercept of the CC curve is higher for women who are expected to follow the Church's doctrine, bringing down the equilibrium contraceptive effectiveness (new equilibrium in E'', as in the case of empowerment).
Religious affiliation is also correlated to women's perception of abortion, which represents a future non-monetary cost in the utility maximization problem of fertility control. More precisely, living with the disapproval of family or community and their own disinclination towards abortion, women suffer additional psychic costs (Tobin, 2010). Religious affiliation potentially exerts a powerful psychological influence against a woman who has had an abortion. And in fact, if the stigma imposed by religious affiliation to the termination of a pregnancy is stronger than its disapproval for contraception use, women may prefer to use contraception to avoid an unintended pregnancy that would force her to have an abortion. For this reason, religion is an important variable to include in the model. Theory brings me to formulate the third prediction.

Prediction 3: Religion has a role in explaining women's choices in terms of fertility. In particular, being affiliated to a Christian religion decreases the odds of using contraception, overall. Moreover, when looking at types of contraception, it decreases the odds of using more effective contraception more significantly than it does with less effective contraceptive methods.

3.3.4 Introducing the institutional environment

This study, which provides a cross-country analysis of fertility control determinants for women, will control, in a second step, for Country-level characteristics that are likely to influence women's choices. In fact, it is implausible to think that women's behaviours are not conditioned by the surrounding environment. When it comes to fertility choices, two variables are worth studying: Women representation in National Parliaments, and Laws defining access to abortion. Data from the Demographic and Health Surveys show that, in the case that women use modern contraception methods, the cost of the method used is a significant determinant of contraception use. More precisely, the higher the cost of contraception, the less likely women are to use it. I will argue that legislators, and in particular women legislators, are able to change monetary and psychological costs of contraception for women.

The theoretical base for this statement is found in political economy models, like the one proposed by Besley and Coate (1997). Reasoning on the "theory of the legislator", the authors argue that women have a distinctive policy-making focus. This theoretical framework first introduces a situation where candidates commit to execute various policies to win the elections. If this is this

case, political decisions will reflect the electorate's preferences, as voters choose representatives that commit to safeguard their interests. Thus, women representation should not have a differential impact on policy decisions: women will vote the candidate that promises to represent their preferences, irrespective of this candidate's gender. However, perfect commitment is unlikely, as politicians can decide freely after they are elected (Clots-Figueras, 2012). Ruling out perfect commitment of the candidates makes room for female representation as a tool for more women-friendly laws being proposed. In fact, it is more likely that a candidate belonging to a minority will propose laws that affect that minority, compared to other candidates. Here, minority is used with a socio-political meaning. Though women represent half of the world population, they are not proportionally represented in parliaments, and are subordinated to a more powerful majority represented by men.

Studies have explored the role of female representatives on women's health, which seems particularly relevant in developing countries, but no study has investigated their specific impact on women's choices in terms of contraception use (Swiss, Fallon & Burgos, 2012). Following the reasoning on health and applying it to women's reproductive choices, more women in Parliaments encourage family planning policies and advocate for more decision-making for other women. By promoting family planning in a region where Governments' efforts are often limited, Latin American female politicians have the chance to decrease concretely the monetary costs of contraception. Moreover, by the empowering effect they have on other women, they might also decrease the social costs of contraception.

Access to Abortion is another macro-level determinant of contraceptive use, as it imposes a future cost to a woman who does not want to have other children (Levine, 2007). Access to abortion can be seen as an insurance, protecting women against unintended pregnancies through a compensation, i.e. the termination of that pregnancy. On the one side, if abortion costs increase, as in the case of more strict access legislation, contraceptive effectiveness will increase. In other words, women will demand more modern and effective contraception methods compared to more traditional methods or no method, in countries where terminating an unwanted pregnancy is more difficult. As abortion becomes more accessible, there will be less urgency to use effective contraception, as the insurance of abortion is available to terminate the unintended pregnancies. On the other side, while this is the hypothesis more supported by literature, a tighter access to abortion may also proxy for the country's closed mindset when it comes to fertility regulation, putting an additional psychological burden on women's autonomy in choosing contraceptive methods (Srikanthan & Reid, 2008).

Theory suggests the increasing effectiveness effect dominates. Having considered these two factors, my final prediction follows.

Prediction 4: Country-specific macro-level indicators do have an impact on women's choices in terms of contraceptive use and effectiveness. In particular, a higher share of women in Parliaments increases the odds of using contraception, and tighter access to abortion increases demand for contraception.

4. Empirical Literature Review

Fertility transition started in Latin America in the late 1960s, and developed fast, so that, by the end of the century contraceptive use by women in unions or marriages had already reached high levels in many countries, like Colombia and Peru. Yet, countries like Haiti and Guatemala presented levels of contraceptive prevalence around 20% (Cavenaghi & Alves, 2009). Several explanations account for these differences, some related to access and acceptance of contraceptive, some to the effective provision of those methods, some to public or private assistance in the use of more effective methods. The purpose of this paper is to run a more recent analysis on selected economies to find out if structural inequality in access to contraception and different acceptation of the methods still exist among countries and, within countries, among different groups of women. The possible determinants of women's contraceptive use analysed in this study are women's education, empowerment and religious affiliation, and country-level female representation and access to abortion.

Among the determinants of fertility, education has been one of the most studied during the last decades (Cochrane, 1979; Sen, 2006; Bongaarts, 2010). In fact, studying individuals' schooling as a determinant of their supply and demand for children gave to start to many studies on the impact of women's characteristics on fertility. The strong role education plays in improving economic standards and changing cultures by spreading knowledge has been proven by several empirical works. In the case of Latin America, ground-breaking studies on female education and contraception were implemented at the end of the last century. Castro-Martin and Njogu (1994) find that, even during the so called "lost decade" of the 1980s, Latin America experienced important declines in fertility, due to the diffusion of contraception.

During those decades, female education was the key to higher awareness and easier acceptance of the first family planning programs. Moreover, highly educated women had more chances to implement their preferred contraceptive practices (Pons, 1999). However, these and other studies pointed out that, although knowledge of at least one contraceptive method was almost universal in Latin America, the range of possible methods known was limited, meaning that, in countries where

Governments not always put family planning as a priority, women are not aware of all the possible contraceptive methods they could use. This causes many women, especially the ones living in rural areas and belonging to more disadvantaged social groups, to deal with the scarcity of effective methods and the consequences of having to use ineffective ones (Pons, 1999). In addition to the spreading inequality among income categories, in Latin America more than in every other developing and developed region in the World, a lot of women that would like to avoid unwanted pregnancies do not use contraception, independently from their socio-economic status. This implies that knowledge is not a sufficient condition for contraceptive use, leaving space to other factors influencing women's inclination to use contraception and their access to it (Cavenaghi & Diniz Alvez, 2009). These factors depend on women's background, intentions towards family and position in life-cycle and society (Gage, 1998).

A great contribution to the literature on women's fertility choices is also given by gender economics papers, studying how women's empowerment has an influence on contraception use. In fact, in Latin America, where women are on average well educated compared to other developing economies, gender inequality and social exclusion work against their decision-making ability (Mason & Smith, 2001). Trying to put a distinct focus on this feature, data from Demographic Health Survey's was used by more recent literature to compute empowerment indicators, based on the number of decisions women made in their households (Do & Kurimoto, 2012; Stanfors & Larsson, 2014; Palamuleni & Adebowale, 2014). Women's empowerment is an evolving process operating at different levels - individual, community, national -, and in different dimensions – economic, social, health-related - of women's life. For this reason, it is always different to measure, and its impact cannot be limited to being a channel of education. There are cases, for example, where women are educated and economically independent, but have no power against their husbands' decisions.

Usually, indicators of women's status are collected looking at the answers given by women in the Survey, creating two main subcategories of empowerment: decision-making power and autonomy. The first type of indicators looks at the ability of women to influence households' decisions on family issues, like the number of children or the frequency of intercourses. Autonomy indicators, which this study focuses on, instead concern decisions on household money, women's own health, the possibility to visit other people freely, large purchases and ordinary-life purchases. Evidence shows that the more the decisions women participated in, the more the autonomy they had in fertility control (Patrikar, Basannar & Sharma, 2014). However, some studies on African Countries

underline how adding empowerment effects to the analysis yields small additional effects to the ones given by education, when controlling for age and income (Stanfors & Larsson, 2014).

Recent studies on Latin America, where gender inequality conditions women's lives, are scarce. For this reason, it appears interesting to study this region and compare the results to the ones found in African countries, where education has been proven to have the absolute dominance on the other effects.

Regarding religion, the culture and norms it brings into communities and households has been shown to influence women's reproductive choices (Caldwell & Caldwell, 1987). Studies find that being affiliated to a religion has a negative impact on contraceptive use. In Latin America, religion is a very important factor in shaping women's choices, and for this reason, it is important to include it as a primary explanatory variable. Studying the impact of the 1968 encyclical Humanae Vitae, Tobin (2010) explains how religion has a double role in Latin American's contraceptive debate: not only Catholicism theologically imposes a ban on contraception, as officialised by the encyclical. It also guides political decisions, as governments tied to ecclesiastical power condemned birth control and opposed the distribution of contraceptive services. Thus, Latin America is the region where the Church's influence can play the most powerful role, compared to other developing regions.

Developing countries started their fertility transitions in the 1960s. However, progress in such demographic development was uneven, meaning that some Latin American economies did not experience the same fertility decline than on others, in spite of overall better economic conditions and almost universal schooling in the entire region. This motivated me to find additional determinants of fertility at Country level. In addition, the fact that neighbouring economies tend to move together when it comes to development calls for a macro-level addition to the model of fertility decisions determinants.

It is not only individual characteristics that matter, as contraception information and practices change in bigger communities, depending on the state of the law for what concerns birth control or abortion, for example. This is particularly true for Latin America, where the impact of female representation has been studied on several dimensions of women's wellbeing, but not directly on their contraceptive behaviour (Swiss, Fallon & Burgos, 2012). In addition, if we talk about costs, we cannot overlook the fact that some of them might be imposed on women vertically, by institutions. An example is given by the variation in abortion allowance in the six countries studied, passing from an absolute ban, in the case of the Dominican Republic, to more loose policies safeguarding mothers' health, as in Colombia.

5. Data

5.1 Six Latin American countries: capturing the different phases of the demographic transition

As anticipated, the purpose of this paper is to detect determinants of women's choices in terms of fertility control in Latin America. In order to do so, I adopted three main sources, one describing the micro-level determinants and two to characterize the institutional macro-level contribution. The first data source consists of the last wave of Demographic and Health Surveys, conducted between 2013 and 2015 in 6 Latin American countries: Colombia, Dominican Republic, Guatemala, Haiti, Honduras and Peru. These countries were selected based on the properties of the Survey. First, the timing in which the survey was completed was important, as having data collected in close periods of time, within the same phase, provides us with the same standardized questions for each country, facilitating comparative analysis. Second, large samples of women and variability in contraceptive use, education, empowerment, religious affiliation and institutional characteristics among countries are useful to capture the current situation in Latin American economies, which find themselves in different phases of the demographic transition.

The most advanced among these countries seems Colombia, whose data were collected in 2015. Situated between South and Central America, Colombia has a population of over 48 million people, of which 76% live in urban areas. Its GDP per capita, around 6000 thousand US dollars, is as high as Peru and Dominican Republic. For what concerns fertility, its Total Fertility Rate has reached a below-replacement level of 1,9. Here, the Total Fertility Rate (TFR) is measured as the mean number of children a woman would give birth to over her reproductive life if she experienced her present age-specific fertility rates. Right after Colombia in terms of TFR stand Peru and Dominican Republic, with a figure of 2.5. Data for both countries belong to the 2013 Demographic and Health Survey. As Colombia, Peru is another continental vast country, situated in South America, with a population of 31 million people, 78% of them living in urban areas. The Dominican Republic, also surveyed in 2013, is instead a state situated in a Caribbean Island, Hispaniola, with a population of around 11 million people, 78% of which live in urban areas.

Completely different is the situation for Haiti, the other state surveyed in 2013 which shares the territory of the island of Hispaniola with the Dominican Republic. Compared to their neighbours, the 11 million Haitian are significantly poorer: their GDP per capita is six times smaller and half of them is under the 3.20 $ per day poverty line headcount ratio, compared to a figure under 10% for the Dominicans. Moreover, their TFR has stagnated around 3.2 in the last years. High TFR is also seen in Guatemala, with a value of 3.1. Guatemala, surveyed in 2014-2015, is a republic situated in

Central America, with a population of 16 thousand people, half of them living in rural areas, and a GDP per capita that is half the one of Colombia, Dominican Republic and Peru. Finally, Honduras, surveyed in the period 2012-2013, is also situated in Central America, and places itself in the middle for what concerns TFR, with a figure of 2.7. Similarly to Guatemala and Haiti, half of its 9 million people live in rural areas. Poverty in Honduras is almost as concerning as in Haiti, with 32% of people living under the 3.20 $ per day poverty line. It is worth mentioning that, in both cases, the environmental disasters of the last years contributed to increasing a poverty that was already higher than in the other four countries. A common factor among the economies considered relates to their young populations, compared to developed economies. Population younger than fourteen years represents between one fourth and one third of the population in the six countries, with peaks of 36% and 34% in Guatemala and Haiti.

5.2 The Survey

The Demographic and Health Surveys collect nationally representative information on population, health, reproduction and nutrition in developing countries. In order to study women's contraceptive choices, I obtained access to data collected in home interviews, where women between the years of 15 and 49 were interviewed on contraceptive knowledge and practices. Usually, respondents were asked to name all the contraceptive methods they know. Then, they were asked whether they heard about other methods that they did not list spontaneously. The questions are standardized in a way that covers the following methods: withdrawal, abstinence, female and male sterilization, male and condom, vaginal barriers like diaphragm, foam and jelly, injectables, norplant, intra-uterine devices (IUD) and birth control pill. Other traditional methods are included depending on the questionnaire. Having tested their knowledge, women who were not pregnant at the time of the interview were asked which contraceptive method they were currently using, together with information on themselves.

The initial sample included observations for 134.936 women aged 15 to 49, among the six countries. However, for the analysis to show a meaningful correlation between the dependent and explanatory variables, avoiding the effect of spurious factors, I built my sub-sample in the following way. First, I only selected women that were sexually active at the time of the interview, assuming that choices on contraception are made by women who are sexually active, and that the two decisions - becoming sexually active and using contraception - are independent one from the other, as in Jacobs and Stanfors (2011). Second, I focused on women that are at risk of unintended – not planned and not wanted – pregnancy. For this reason, I only considered women who did not want any more children and women who did not want children within the next two years from the interview. Among them, I only included in my analysis women who, at the time of the interview,

were not pregnant, were fertile, had not been sterilized, and had reported having had intercourses in recent times. For the specific case of Latin America, where women's reproductive life is strictly related to their union/marital status, another exclusion has to be made. Following Westoff and Bankole (1996), sexually active women who are not married nor in a union may underreport their sexual activity not to face social stigma, posing a strong downward bias on the results. For this reason, I excluded from the sample women who reported never being in a union or marriage at the time of the interview. The final sample, disregarding women whose answers for crucial variables were not registered, counted 52,741 observations (11,555 in Colombia; 2,770 in Dominican Republic; 10,074 in Guatemala; 6,799 in Haiti; 9,511 in Honduras and 12,032 in Peru).

5.3 The variables

This paper looks at women's choices in terms of contraceptive use and effectiveness. In technical terms, contraceptive effectiveness combines both a certain method's theoretical efficacy in preventing a pregnancy and its common use effect. It can be defined as the number of pregnancies avoided per 100 woman-years, but is most commonly represented as the percentage of women who managed to avoid unintended pregnancies in the first year after the method's use (Mosby's Medical Dictionary, 2009). Looking at effectiveness, I divided contraceptive methods into three groups: (i) no method (or chance), with an effectiveness of 15% - meaning that the pregnancy rate for couples who have intercourses but do not use contraception is equal to 85 pregnancies for 100 woman-years -; (ii) less effective methods, with an effectiveness between 72% and 90%; and more effective methods, with effectiveness between 90% and 100%. A more detailed description of effectiveness rates is given by Table 5.1. Of course, higher effectiveness comes with a cost, as more innovative methods like injections and implants are more expensive than more traditional ones.

This study has two dependent categorical variables. One indicates whether women use contraception or not. The other shows whether women choose to use less or more effective contraceptive methods compared to no method. The same type of analysis will be run for the two variables. From the Demographic Health Surveys. I retrieved data on education levels, religious affiliation and autonomy. For what concerns education levels, I distinguished four groups: no education, primary education, secondary education and higher education. To account for religious affiliation, I created a dummy variable for Christianism, comprehending affiliation to the Catholic and Protestant Church. On women's empowerment, exploiting a number of household decisions in which women may or may not participate, I computed an indicator that proxies for women's autonomy and bargaining power in household decisions, as in Casique (2001).

Two other data sources were used to account for women representation and abortion policies: The PARLINE Database of National Parliaments and the Centre for Reproductive Rights' World

Table 5. 1: Contraceptive Effectiveness, by Type.

Type	*Method*	*Use effectiveness*
Chance	No method	15%
Less Effective Methods	Foam	72%
	Withdrawal	73%
	Standard days Method	76%
	Periodic Abstinence	76%
	Female condom	79%
	Male condom	82%
More Effective Methods	Vaginal ring	91%
	Patch	91%
	Pill	91%
	Injections	94%
	Norplant	99%
	IUD	99.2% - 99.9%

Source: U.S. Department of Health and Human Services.
Note: the figures indicate the percentage of women (out of 100) who did not experience unintended pregnancies in the first year of each method's typical use.

Abortion Laws Map. Regarding women representation, I retrieved information on the percentage of women in both Parliamentary chambers, in the case of bicameral parliaments (Colombia, Dominican Republic and Haiti), or in the unicameral Parliament (Guatemala, Honduras and Peru). To be more precise, I reported two figures, one for the current female representation at the time of the Survey, and one for the female representation as it was in the election previous to the Survey. The reason is that legislation can take time to change contraception access, and so does the presence of more female politicians in empowering women and changing the perception of fertility control.

From this source I also obtained information on the dominant parties in those elections, to control for the fact that more favourable contraception laws may simply come from more progressive governments, and not because more women in politics advocate for them.

The World Abortion Laws website gives country level information on the current state of the law for what concerns access to abortion. In particular, not only it points out whether a law is in force or not, but gives different scores to countries depending on the tightness of such laws. Among

developing economies, Latin America performs as bad as some African Regions, despite the differences in economic development highlighted by literature. In fact, only for 3% of women living in Latin America abortion is allowed. Focusing on the six states in the sample, the Dominican Republic, Haiti and Honduras have the most restrictive laws: abortion is prohibited altogether, and the law has no explicit exception to save women's lives. One level above, Guatemala's law explicitly alludes to the possibility of practicing abortion to save women's lives. Peru and Colombia are more advanced, abortion being allowed to preserve women's physical (in Peru) and even mental and psychological (in Colombia) health. Between the six, Colombia is the only one allowing abortion for rape, incest and fetal anomalies. A summary description of all the variables included in the model and how they were constructed is presented in Table 5.2.

From the Demographic Health Surveys, I also obtained data that might be responsible for shifts in the relationship between contraception use and the explanatory variables, and, for this reason, needs to be controlled for. Some of these variables are related to women's demography: age and place of residence (rural or urban). The others are socio-economic characteristics: employment status (working or not working) and household wealth (indicating in which quintile women fall, from poorest to richest).

Table 5.3 shows descriptive statistics on contraception use and the individual-level characteristics shaping it. From this preliminary analysis, a striking fact is worth commenting. In two out of the six countries studied, Guatemala and Haiti, almost or more than the majority of women in unions at risk of unintended pregnancies was not using contraception at the time of the – very recent - Survey. In fact, the only two countries with contraception use over 70% are Colombia and Peru. When women do use contraception, however, they strongly prefer more effective methods, except for the case of Peru, where less and more effective methods are both widely used. For what concerns education, average years of schooling are between 9 and 10 in Colombia and Dominican Republic, while the worst performer is Haiti, with less than 5 years of education on average. As we can see, diversity in education is already high among countries, suggesting that we may see differences in contraception use related to these discrepancies in education. Moreover, as shown by the very high standard deviations in parentheses, there are large inequalities within countries, with very different educational experiences. Looking at participation in the Labour Force, which proxies for opportunity cots of having children, Colombia, Haiti and Peru stand out for women employment, the last country with 67% of respondents reporting being employed. It is worth mentioning that many women work in the informal sector in Latin America, causing this figure, and the costs it proxies for, to be underestimated.

Table 5. 2: Relevant Variables description

Variable	*Description*
Dependent variables	
Contraceptive Use	Categorical variable taking the value of 0 if women indicated "no method" as their current contraceptive method, 1 otherwise.
Contraceptive Effectiveness	Categorical variable taking the value of 0 if women indicated "no method" as their current contraception method, 1 if they indicated less effective measures, as in Table1, and 2 if they indicated the most effective methods.
Explanatory Variables	
Education Level	Categorical variable taking the value of 0 in case of no education, 1 in case of completed primary education, 2 in case of completed secondary education and 3 in case of completed higher education.
Empowerment	Categorical indicator built on whether women can decide about household and husband's money, small and large purchases and visits. The indicator takes values from 0 to 5, depending on the number of decisions women participate in, out of the five just mentioned. I then grouped the six possible results into three categories of empowerment: low (scores 0 and 1), medium (scores 2 and 3) and high (scores 4 and 5).
Religion	Categorical variable taking the value of 0 in case of no religion, of 1 in case of Catholicism and 2 in case of Evangelism and Protestantism.
Women in Parliaments	Percentage of female legislators in the Unicameral parliament or in the Senate Chamber (in case of bicameral parliament), at the moment of the Survey.
Women in Parliaments (-1)	Percentage of female legislators in the Unicameral parliament or in the Senate Chamber (in case of bicameral parliament), as elected in the legislature before the survey was conducted.
Abortion Law	Categorical variable taking the value of 0 in case of more lenient legislation, considering women's mental health, 1 and 2 for different levels of consideration of women's physical health, and 3 for total ban of abortion practices.

Religion is a strong component in shaping women's decisions and perception of contraceptives. Christian affiliation is strong in all the Latin American countries studied. The only country where the percentage of women not affiliated with the Christian Church is high (38%) is the Dominican Republic, followed from great distance by Colombia, Guatemala and Honduras, with around 12% of

Table 5. 3: Descriptive statistics of sample characteristics across variables of interest.

Variable	*Colombia*	*Dom. Rep*	*Guatemala*	*Haiti*	*Honduras*	*Peru*
Contraceptive Use						
No method	24.47%	38.27%	46.28%	62.08%	35.60%	24.88%
Less Effective	18.16%	13.47%	21.26%	8.38%	17.24%	38.54%
More Effective	57.47%	48.27%	32.46%	29.53%	47.16%	36.58%
Education Years	9.10	9.78	5.05	4.73	6.24	8.49
	(4.04)	(4.13)	(4.41)	(4.20)	(4.03)	(4.34)
Education Level						
No education	2.54%	3.57%	19.52%	24.36%	6.37%	4.17%
Primary	23.42%	31.55 %	51.68%	42.28%	62.37%	34.44%
Secondary	46.54%	41.01%	24.49%	30.50%	26.96%	41.25%
Higher	27.50%	23.86%	4.32%	2.85%	4.30%	20.14%
Women employed	57.71%	45.54%	39.10%	54.10%	41.23%	66.38%
Religion						
No religion/Other	12.4%	37.91 %	12.05%	7.18%	11.79%	6.2%
Christian	87.6%	62.09%	87.95%	92.82%	88.21%	93.8%
Empowerment						
Low (0-1)	15.78%	40.32%	26.39%	23.29%	31.98%	20.34%
Medium (2-3)	36.06%	38.19%	53,97%	50.74%	50.07%	20.28%
High (4-5)	48.15%	21.48%	19.63%	25.97%	17.95%	59.38%

Note: Standard deviation in parentheses.

non-Christian women. Lastly, looking at the empowerment indicator that I created, the majority of women in Guatemala, Haiti and Honduras have a medium level of decision-making autonomy in their household. Again, Colombia and Peru stand out as positive examples with, respectively, 48% and 59% of women living in these countries scoring either 4 or 5 out of 5 in the empowerment indicator. One worrying case is offered by the Dominican Republic, where two fifths of women have very low power in their households.

From this preliminary analysis, a question arises on which kind of women uses no method, less effective methods or more effective methods, based on education, religion and empowerment, but also contextual factors like age, wealth, employment status and place of residence. In general, the majority of women with no education uses no contraception, while women with secondary and higher education use more effective methods. However, some exceptions are worth mentioning. In

Haiti, for example, in every education category, the majority of women does not use contraception. Moreover, even in more advanced countries like Peru and Colombia, more than one fourth of women that have completed secondary education use no contraceptive method. For what concerns religion, women affiliated with the Christian Church are equally divided between use of effective methods and no use, while women who are not affiliated tend to use contraception more, compared to not using any. Empowerment seems to have a consistent effect in all countries: the more empowered the women, the higher the share of them uses effective contraception. Of course, other factors influence women's choices. Women who are employed, in the richest quintiles and live in urban areas use contraception in higher shares compared to women who are unemployed, poorer and live in rural areas. The differences are less pronounced in countries where governments are more open towards family planning policies.

For what concerns age, the effect is mixed. For a region like Latin America, where women tend to have children at a young age and want to protect themselves against unintended pregnancies later in their reproductive lives, the number of women older than thirty years not using contraception is exceptionally high in all countries, reflecting a need for contraception that is not exhaustively met by public and private provision (for more complete results go to Table A1 and A2 in the Appendix). From these statistics it is clear that in most countries, though the majority of women have at least started secondary education, a consistent share of them still uses no contraception, despite the risk of unintended pregnancies. This motivates me to study the micro-level determinants of fertility control choices for women in a stepwise analysis, first looking at education, empowerment and religion alone, then adding the state-level characteristics on women representation and abortion laws and the contextual controls mentioned above. The following session shows the model used to perform such analysis.

6. Methodology

Longitudinal studies are often preferred to cross-sectional studies when it comes to detecting causality. Supporters of this view state that, as the causes come before the effects, causal inference can be detected only following individuals over time. However, some authors point out that a structural modelling strategy and a background knowledge of the issue may help find the mechanisms through which an explanatory variable causally modifies the dependent variable (Wunsch, Russo & Mouchart, 2010).

Though it is beyond the scope of this paper to find a proper causal inference of individual and institutional characteristics on women's choices towards fertility control, some useful and valid information can be drawn from this correlation analysis, for two reasons. The first is that, though no

apparent time dimension exists in cross-sectional data, a partial impact of education on contraceptive effectiveness on adult women can, for example, be detected, as education comes before fertility control decisions for adult women. Second, the bigger sample made available by the Demographic and Health Surveys gives the model statistical power and reduces the sample selection bias.

The aim of this study is double. First, it wants to look at how changes in individual and Country-level characteristics influence the choice of using contraception or not using any method in the entire sample. In this first part of the analysis, the outcome variable is binary: either women do not currently use any method, or they use one. Following Stanfors and Larsson (2014), I performed a sequence of binary logistic regressions: in the first specification, I included education, empowerment and religion, adjusting only for women's age. In the second specification, I added the country-level female representation and the abortion law severity indicator. Lastly, I controlled for women's background characteristics like employment status, wealth and place of residence, that may drive the results since they are responsible for access and use of contraception. The model used in this paper can be written as follows:

$$Y_{ij} = \beta_0 + \beta_1 W_{ij} + \beta_2 S_j + \beta_3 C_{ij} + \sigma_j + \varepsilon_{ij}$$

Where Y_{ij} is the dichotomous outcome variable of current contraception use for woman *i* in country *j*. In a logit model, the odds of using contraception (the desirable outcome) compared to not using any method (the failure outcome) depend linearly from the predictor variables on the right-hand side of the equation above. Here, β_0 is an intercept term. W_{ij} represents the set of women's individual characteristics expected to influence their choices: education level, empowerment score and religious affiliation. S_j includes the Country-level female representation and the level of severity of national abortion laws. β_1 and β_2 are the vectors of coefficients associated with these characteristics. For the analysis to be robust, C_{ij} is a set of controls including employment status, wealth and place of residence, and σ_j represents country fixed effects, taking into account unobservable national characteristics shared by all women in each country, that might drive contraception decisions. One example is the different level of development in each country in the same period. Finally, ε_{ij} is the error term.

The second aim of this study is to run an analysis on contraceptive effectiveness. In order to do so, I will need to predict how the odds of using a more or less effective method compared to no method vary linearly with the individual and country-level predictors. In fact, since more than two alternatives will be compared in this part of the analysis– No method, less effective methods and more effective methods - I will set up a multinomial logit model. Multinomial logistic regressions

are usually adopted to model categorical outcome variables with more than two possible results, so that the logarithmic odds of the outcome variables are the explanatory variables' linear combinations (Long & Freese, 2006). Formally, log odds can be written as:

$$\mu_{ij} = \frac{\log \pi_{ij}}{log \pi_{iJ}} = \alpha_j + x_i' \beta_j$$

Where μ_{ij} is the log-odd of belonging to category *j* for individual *i*, α_j is a constant, x a vector of explanatory variables, and β_j a vector of coefficients for j= 1, 2. This model is a multinomial version of a logistic regression, meaning that we compute J-1 equations and not just one. Since I have three categories, I will then have two equations, one comparing the odds of using less effective contraceptive methods compared to not using any, and one comparing the odds of using more effective contraceptive methods compared to the base category of "no method". As before, the model can be written as:

$$Z_{ij} = \gamma_0 + \gamma_1 W_{ij} + \gamma_2 S_j + \gamma_3 C_{ij} + \rho_j + v_{ij}$$

The difference with the previous binomial model is that the categorical dependent variable Z_{ij} now provides three alternative answers on current contraceptive use: "no method", "less effective method" and "more effective method". Again, W_{ij} includes women's education level, empowerment score and religious affiliation; S_j intakes into account Country-level female representation and national abortion laws; C_{ij} controls for employment status, wealth and place of residence; ρ_j represents country fixed effects; and v_{ij} is the error term.

The results presented in the next section will be in terms of relative risk ratios. In other words, I will comment on the log odds defined above, which represent the ratio between the probability of choosing one category (less effective or more effective) over the probability of choosing the base category where no method is used. The "no method" category is not simply chosen as a default one here. Indeed, it is necessary for the purpose of this study to compare this specific scenario with the alternatives, for two reasons. First, because it represents the case in which economic and social costs play such a role that a woman decides not to use any method. Second, because its effectiveness is so low (15%) compared to other methods that a woman has clear in her mind the risk scenarios between not protecting herself against unintended pregnancies and acting to avoid them.

7. Results

This section presents the results of my analysis on Latin American economies, starting with the binary regression on contraception use, and following up with the multinomial regression on contraception effectiveness.

7.1 Binary logistic model results

Table 7.1 shows how variation in the explanatory variables changes the odds of using contraception, indicate that being exposed to a certain predictor variable raises the odds of using contraception, compared to not using any. Conversely, an odd ratio smaller than 1 indicates that being exposed to a certain explanatory variable decreases the odd of using contraception, compared to not using it. Moreover, every categorical variable's interpretation is in relation with its base category. For example, education has four categories: no education (shown in parentheses), primary education, secondary education and higher education, compared to not using any method. As results are shown in terms of odds ratios, values larger than 1 I will thus interpret odd ratios of having completed primary, secondary and higher education, compared to the base category of no education, to comment on how being exposed to higher levels of education increases the odds of using contraception, compared to the base category of no education, to comment on how being exposed to higher levels of education increases the odds of using contraception. In Table 7.1, Column 1 represents the baseline regression, where the binary variable of contraception use is regressed on education level, empowerment and religion affiliation, controlling only for age. Column 2 includes Country-level variables on female representation and abortion law. Finally, Column 3 reports the results controlling for demographic and socio-economic variables and Country fixed effects.

Starting with Column 1, *Education Level* is positively and significantly correlated with contraception use. Compared to the odds of women who have not completed any level of education, the odds of using contraception are 1.62 higher for women who have attained primary education. The gap increases, though not strongly, when considering higher levels of education, so that the odds of using contraception for women with higher education are 1.78 higher than the ones of women who have not completed any education. Let us now move to *Religious affiliation*. Looking at the odds ratio smaller than one, I find that being affiliated with a Christian religion, be it Catholicism of Protestantism, decreases women's odds of using fertility control compared to the ones of women who do not align with the Christian doctrine. In fact, Christian women have their odds of using contraception halved compared to the ones of women who do not recognise themselves as part of the Church. *Empowerment* seems to have the strongest significant role among the three individual predictors. Women's odds of using contraception are 3.69 times higher when they have a medium empowerment level within their household, compared to the odds of women who have low empowerment. The difference increases when we compare women with high empowerment and women with low empowerment, meaning that the odds of using contraception are higher the higher the empowerment of women.

Table 7. 1: Binomial Logistic regression (Odds ratios)

Variables	*(1)*	*(2)*	*(3)*
Individual characteristics			
Education (no education)			
Primary education	1.620***	1.257***	1.226***
	(0.058)	(0.046)	(0.046)
Secondary education	1.731***	1.341***	1.276***
	(0.065)	(0.052)	(0.054)
Higher education	1.787***	1.248***	1.172***
	(0.079)	(0.058)	(0.061)
Religious affiliation (No religion/other)			
Christian	0.487***	0.882***	0.877***
	(0.011)	(0.035)	(0.035)
Empowerment (Low)			
Middle	3.691***	4.074***	3.970***
	(0.092)	(0.104)	(0.103)
High	5.774***	6.215***	6.367***
	(0.158)	(0.176)	(0.182)
Age	1.192***	1.214***	1.221***
	(0.010)	(0.011)	(0.011)
Age squared	0.997***	0.996***	0.996***
	(0.000)	(0.000)	(0.000)
Country-Level characteristics			
Female representation	-	1.091***	1.092***
		(0.003)	(0.003)
Abortion law severity (Low Severity)			
Medium-low Severity	-	0.932**	0.905***
		(0.025)	(0.025)
Medium-high Severity	-	1.007	1.055
		(0.049)	(0.051)
High Severity	-	1.991***	2.146***
		(0.092)	(0.103)
Controls			
Employment status (Unemployed)			
Employed	-	-	0.846***
			(0.019)
Wealth (Poorest Quintile)			
Median Quintile	-	-	1.085**
			(0.037)
Richest Quintile	-	-	1.245***
			(0.057)
Place of Residence (Rural)			
Urban	-	-	1.106***
			(0.029)
Country Fixed Effects	No	No	Yes
Observations	52,741	52,741	52,741
Log pseudolikelihood	-29,691.095	-28,934.41	-28,877.754
Pseudo R-squared	0.141	0.163	0.165

Note1: Robust Standard errors are in parentheses

Note 2: *** indicate significance at 1% level, ** at 5% level and * at 10% level.

Age is also positively related with contraception use, with decreasing marginal effects. The odds ratio for increasing Age by one year is 1.19.

In Column 2, Country-level characteristics are added to the regression. The odds ratios for the education levels decrease from values around 1.6-1.7 to values around 1.2-1.3, without losing significance. The role of religion is rescaled - with the odds ratio of using contraception increasing - but it stays significantly smaller than 1, keeping the same interpretation. What does not appear to be reduced by the addition of institutional quality indicators is empowerment, whose odds ratios actually increase, compared to the ones in Column 1. For example, the odds of using contraception for a highly empowered woman are six times the odds of using contraception of a low empowered woman. *Female representation* is positively and significantly associated with contraception use: the odds ratio of increasing the share of women in Parliaments by one percentage point is 1.091. An important result is also given by the introduction in the regression of the *severity of abortion laws* by Country. Looking at women living in countries where abortion is completely banned (High severity), their odds of using contraception are almost twice the ones of women living in slightly more permissive countries.

Column 3 finally controls for women's background characteristics, like wealth, place of residence and employment status. Women who are richer, live in cities and are employed are more likely to use contraception, and this may drive the results. Looking at the odd ratios for education, they remain higher than one and significant, though slightly diminished. The odds ratios for Religious affiliation do not significantly change, and remain uninfluenced from socio-economic characteristics. Very small changes can also be noticed when looking at empowerment. In fact, the odds ratio for high levels of women empowerment slightly increases, compared to Column 2. The odds ratios for *Wealth* and *Place of residence* are, as expected significant and bigger than one, indicating a positive relationship between contraceptive use and socio-economic status. The odds of using contraception for woman in the richest quintile, for example, are 1.25 times higher than the odds of a woman in the poorest quintile. Moreover, the odds of using contraception for a woman living in an urban area are 1.11 times the ones of a woman living in a rural area. The only variable that presents a value different from the one predicted is *Employment status.* The value smaller than one indicates that being employed has a negative impact on contraception use, compared to not being employed. This result, however, does not come as a surprise. As anticipated, many women working in the informal sector are considered not employed, and this poses a large underestimation bias on the odds ratio. Commenting on the Pseudo R-squared, it increases from 0.141 in the first

specification, to 0.165 in the last one, not changing relevantly between steps 2 and 3 of the nested analysis.

7.2 Multinomial logistic model results

This section presents the results for the multinomial logistic regression. While the predictor variables stay the same, the focus of the analysis now moves to contraceptive effectiveness. Columns 1, 3 and 5 compare risk ratios of Less Effective methods to No method, while Columns 2, 4 and 6 compare risk ration of More effective methods compared to No method.

As before, three specifications are shown: columns 1 and 2 show results for the baseline regression with individual characteristics, Columns 3 and 4 add Country-level characteristics, and Columns 5 and 6 control for women's background characteristics. Looking only at individual determinants of contraceptive choices, schooling, religion and women's empowerment are overall highly significant. For women who have completed secondary education, for example the risk of using less effective contraception, compared to no contraception, is 1.88 times the one for women not having completed any education. Comparing the same two categories of women, the relative risk ratio is 1.64. As in the binomial regression, being affiliated to the Christian Church has a negative relationship with the use of both less effective contraception and more effective contraception, compared to no method, as it is clear from the relative risk ratio smaller than one in both Columns 1 and 2. Looking at empowerment, passing from low levels of women's empowerment to higher ones, both the odds of choosing more effective methods and less effective methods, relative to no method, increase significantly.

Passing to Columns 3 and 4, the risk ratios of education levels become smaller, but remain positively correlated with less effective and more effective contraception use. The same happens for the empowerment indicator, which in fact increases in this second specification. Introducing Institutional Variables reduces the negative relationship between religion and more effective contraception use, while the relationship with less effective use becomes insignificant. This is probably a sign of the double effect of religion on contraception in Latin America. On the one side, its doctrinal ban for any barrier to procreation increases costs of contraception. On the other side, it works by influencing governments' choices and attitudes towards family planning. Accounting for institutional factors, they absorb this second channel. Women representation is positively and significantly related to contraception use. In particular, the relative risk of using more effective contraception compared to not using any for increasing female representation in national parliaments by one percentage point is 1.086. For what concerns abortion law, the relative risk of

Table 7. 2: Multinomial logistic regression (Relative Risk Ratios)

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Individual characteristics						
Education (no education)						
Primary	1.686***	1.568***	1.332***	1.211***	1.273***	1.193***
	(0.080)	(0.063)	(0.065)	(0.050)	(0.063)	(0.050)
Secondary	1.881***	1.637***	1.549***	1.231***	1.395***	1.209***
	(0.094)	(0.069)	(0.080)	(0.054)	(0.079)	(0.057)
Higher	2.120***	1.593***	1.654***	1.037	1.425***	1.022
	(0.120)	(0.078)	(0.098)	(0.053)	(0.095)	(0.059)
Religious affiliation (No religion/other)						
Christian	0.456***	0.504***	1.033	0.836***	1.027	0.831***
	(0.013)	(0.012)	(0.058)	(0.035)	(0.057)	(0.035)
Empowerment (Low)						
Middle	3.706***	3.683***	4.341***	3.983***	4.218***	3.886***
	(0.131)	(0.102)	(0.158)	(0.113)	(0.156)	(0.111)
High	6.286***	5.480***	6.567***	6.056***	6.705***	6.205***
	(0.227)	(0.165)	(0.246)	(0.190)	(0.252)	(0.197)
Age	1.214***	1.228***	1.217***	1.260***	1.222***	1.267***
	(0.014)	(0.012)	(0.014)	(0.012)	(0.014)	(0.012)
Age squared	0.997***	0.996***	0.997***	0.996***	0.997***	0.995***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Country characteristics						
Female representation			1.105***	1.086***	1.106***	1.086***
			(0.004)	(0.003)	(0.004)	(0.003)
Abortion law severity (Low)						
Medium-low	-	-	1.528***	0.730***	1.471***	0.713***
			(0.056)	(0.022)	(0.054)	(0.022)
Medium-high	-	-	1.877***	0.674***	2.010***	0.697***
			(0.121)	(0.035)	(0.131)	(0.036)
High	-	-	2.027***	2.053***	2.271***	2.166***
			(0.132)	(0.100)	(0.152)	(0.109)
Controls						
Employment status (Unemp.)						
Employed	-	-	-	-	0.831***	0.859***
					(0.024)	(0.021)
Wealth (Poorest Quintile)						
Median Quintile	-	-	-	-	1.095**	1.084**
					(0.048)	(0.040)
Richest Quintile	-	-	-	-	1.388***	1.156***
					(0.079)	(0.058)
Place of Residence (Rural)						
Urban	-	-	-	-	1.089**	1.117***
					(0.037)	(0.032)
Country Fixed Effects	No	No	No	No	Yes	Yes
Observations	52,741	52,741	52,741	52,741	52,741	52,741
Log pseudolikelihood	-50,337	-50,337	-48,709	-48,709	-48,631	-48,631
Pseudo R-squared	0.103	0.103	0.132	0.132	0.134	0.134

switching from the least severe law to the most severe one is 2.053 for effective contraception, and 2.027 for less effective contraception.

Columns 5 and 6 present the results for the complete model. Again, relative risk ratios slightly decrease for education, but remain unchanged for religion and empowerment. Being in the richest quintiles and living in urban areas increase relative risk ratios of less and more effective use similarly, while employment still shows a ratio that is smaller than 1.

8. Discussion

8.1 The role of education, empowerment, religion and the institutional context

The results in this paper confirm the positive association between women's education and empowerment and contraceptive use found in previous literature and predicted in the theoretical considerations. Moreover, the negative association between being affiliated with the Christian Church and the odds of using contraception adds information to the scarce number of existing empirical studies. For the Latin American women selected for this study, having completed primary education improves significantly their odds of using any kind of contraception. However, in a region where gender inequality and violence against women are the strongest in the world, women's autonomy, measured as the number of decisions they participate in taking in their household, has its own – stronger – empowering role. Comparing higher education attainment and high empowerment in the household, the former provides odds ratio smaller than two, while the latter gives values close to 6. A part of the literature suggests that higher autonomy is a channel through which education empowers women. For the period studied (2013-2015) this seems to be only partially true. In fact, running a regression of the empowerment indicator on education level suggests that education is a good predictor of women's autonomy only until a certain threshold. Higher levels of empowerment do not depend significantly on education, but on structural social constructs, confirming what argued in Cavenaghi and Alves (2009).

When checking the sensitivity of parameters by adding important institutional and socio-economic characteristics, the magnitude of education levels odds ratio decreases. The reason is found in the high inequality in opportunity that characterizes the region, where education is highly dependent on wealth, place of residence and the institutional setting. This decreasing role of education when controlling for institutional and background factors underlines the importance of contextual differences among the countries studied, as assessed in Section 5.1. These differences explain part of the association between higher levels of education and contraceptive use. What does not seem to be weakened by the introduction of wealth index, employment status and place of residence is empowerment, whose influence remains consistently strong. This marks a difference when

comparing this work to studies on Sub-Saharan Africa, where education matters more and more robustly than empowerment in women's choices on contraceptive use (Do & Kurimoto, 2012; Stanfors & Larsson, 2014). For what concerns the choice of using any contraceptive method compared to no method, confirming my prediction, being affiliated with the Christian Church reduces the odds of using contraception compared to no being affiliated with such doctrines. This remains true for a part of the population, even if increasing shares of people who follow the Church have started using fertility controls.

This paper also introduces an institutional component. Recent studies have shown that women representation matters when it comes to women's health, especially in developing countries (Clots-Figueras, 2012). In this study, female representation proxies for government openness towards family planning programs, as more women in parliaments propose more laws protecting women's rights and choices. As predicted, higher shares of women in Parliaments increase the odds of using contraception. To the best of my knowledge, no study has used female representation to explain women's choices on family planning in Latin America. For what concerns abortion Laws, which are instead being increasingly studied as determinants of contraception use, women living in Countries where abortion is banned choose to use more contraception compared to women that, in case of unintended pregnancy, have better chances to abort in a safe legal way. This result is in line with existing literature on the relationship between abortion and contraceptive costs.

The purpose of this paper was double. After assessing the significant role of education, empowerment and religion on the choice use-not use, I looked at the relationship between these predictors and women's choice of more or less effective contraception, compared to no method. The pattern of the results is similar to the previous part: the positive association between contraceptive effectiveness and education and empowerment is confirmed to be significant for both more and less effective methods. The same holds for the negative association between religion and contraceptive effectiveness, though in this case the predictor affects significantly only the choice of more effective methods. Looking at the last two columns of Table 7.2, one interesting fact is that odds ratios for less effective methods and more effective methods are similar, except for the case of religion. In other words, higher levels of education, for example, increase the odds of using more effective contraception to the same extent to which they increase the odds of less effective contraception (compared to not using any). This may imply that education and empowerment matter more when women decide whether to use contraception or not, than when they decide the level of effectiveness of fertility control. If this is true, it reflects two things. First, there is a structural inequality in access to contraception. For women living in rural areas, which means half of the women in Guatemala,

Haiti and Honduras, who do not have higher levels of education, there is a ceiling banning them to access any type of contraception. This happens because family planning provision in some Latin American countries is ignored by governments and left in the hands of private companies, who are situated in urban areas and ask for payments when providing birth control. This may result in a self-perpetuating intergenerational spiral of inequality, between women in the first place, but also between genders, as this inequality hits women's choices more than men's. Second, though almost all women know one method of contraception, their knowledge on the variety of methods available is limited, in particular in the case of effective contraception, which is a symptom of the absence of government-guided information campaigns.

8.2 Policy Implications

These considerations have policy implications. Apart from the role of education, exhaustively discussed by literature, and religion, which is linked to people's personal sphere and decision to adhere to certain doctrines, two key factors play a role in shaping Latin American women's choices: their level of autonomy in the household and their countries' openness towards family planning policies. In this scenario, I identify two virtuous countries, Colombia and Peru, and two countries who are lagging behind, Haiti and Guatemala. Colombia and Peru appear to be at the end of the fertility transition, with total fertility rates as low as in developed economies. Their success in decreasing fertility, net of a better economic performance, was due to higher involvement of governments in family planning policies since the 1970s. Both countries also have a high percentage of women that take part in the majority of the decisions in their household, as a consequence of programs aimed at giving women responsibility over grants and household expenditures. Finally, around 80% of women in these two countries live in cities and urban areas, which exposes them to a more open, rich and dynamic environment.

On the opposite side of progress in fertility we find Haiti and Guatemala, living proof of the stagnation of fertility reduction described by Bongaarts (2008) for recent decades. Compared to Colombia and Peru, women from the Caribbean state and the central American Republic, saw no involvement of government in family planning policy in the last twenty years, so that the push to fertility reduction given by economic development was not enhanced by the public promotion of contraceptive use. Moreover, costs of more effective methods are excessively high for certain social classes. Again, it is not plausible to think that women from these two countries desire more children, as the analysis was run on women who did not want to have children in the two years following the survey. This means there is an unmet need for contraception that calls for policy

action. In line with what suggested by Cavenaghi and Alves (2009), structural changes should be aimed increasing women's autonomy, which is often weakened by high poverty, especially in Haiti.

8.3 Limitations

Overall, results are in line with the four predictions made in the theory section. However, the analysis presents some limitations, both conceptual and due to the properties of data. This paper studies the role of a number of predictors in women's decisions towards fertility control. However, husbands often play a role in decisions shaping couple's fertility. In particular, husbands' education and desire for children have been proved to have significant impacts on women's choices, as they change the relative position of women in the household. Being aware of the fact that men's characteristics are also of value, especially if we think of a model where husband and wife negotiate their way to a solution, the individual characteristics I included in my model are the most important drivers of bargaining power for women: Women who are more educated, more empowered, and less constrained by religious affiliation are more likely to control their fertility, independently from their partners' characteristics. In the case of Latin America, where the burden of fertility control is often passed down to women because it is not considered a man's concern, this is even more valid. For this reason, even if limiting the analysis to women's characteristics hides information on the role of husbands, it stills informs about many of the factors driving women's choices.

This study focuses of women's behaviours, looking at the actual methods currently used by them at the time of the interview. However, it would be interesting to look at whether the predictors used in this analysis modify their intentions to use contraception differently compared to how they modify their behaviour. Differentiating between changes in intentions and changes in behaviour would make all the inequality in access and unmet need for contraception emerge, with more precise policy implications.

One consideration has to be made on condoms, the only barrier to fertility that also influences protection against HIV infections. In this analysis, condoms were included in the less effective category, based on their effectiveness rate. This may imply a bias when comparing less effective and more effective methods. In fact, higher education and empowerment increase use of condoms for an additional reason compared to the other methods: more educated and informed women will use more contraception not only for limiting fertility, but also for avoiding sexually-transmitted diseases. This double effect may be partially responsible for the fact that the odds of using more and less effective methods increase similarly when women's conditions improve. However, only 7% of women in the sample use condoms, and its use in married/united couples is more likely to be for avoiding additional births.

Finally, as anticipated in the methodology section, using cross-section information does not allow me to draw any conclusions on causation. However, even in the case of more surveys for the same country, so many contextual variables interfere with women's contraceptive use that it would be impossible to rule out endogeneity from omitted variable bias. Another limitation coming from the data is that many countries located in South America are missing from the Survey, so that the countries selected are not representative of the entire continent. However, choosing countries at different steps towards the completion of the fertility transition allowed me to exploit the variance of a large dataset to comment on the role of important characteristics, updating literature on contraceptive use.

9. Conclusions

This study examined the association between women's education, empowerment and religious affiliation and their choices in terms of contraceptive use and effectiveness, in the light of important institutional and contextual differences among countries. The analysis was conducted using the most recent Demographic and Health Survey data on six Latin American countries: Colombia, Dominican Republic, Guatemala, Haiti, Honduras and Peru. Although these countries started what seemed a fast demographic transition in the 1960s, only Colombia and Peru have reached under-replacement level fertility rates, while, for example, Haiti and Guatemala's Total fertility rates have stagnated around values higher than 3 for the last decades. These differences motivated me to study women's choices of contraception in one of the most unequal regions in the World. In building my model, education was the first variable included, as it is the most studied determinant of fertility control in literature. In addition, to study Latin America, where gender inequality and the submission of women in the household are structural, I introduced an indicator of empowerment to address the role of women's autonomy on their choices. Finally, as religion impacts women both individually and by influencing countries' policies on family planning, I included religious affiliation as a predictor. Following theory, these variables influences women's demand, supply and preferences for children, acting on their choices on contraceptive adoption. To perform my study, I used binary and multinomial logistic regressions that allowed me to compare the odds of choosing a certain method among women belonging to different categories. To improve the sensitivity of my analysis, I introduced institutional-level variables proxying for country-level openness towards family planning. Controlling for such characteristics appears essential when comparing countries like Colombia, where governments took action to promote contraceptive use, and Haiti, where the State has not intervened in the past decades.

I found that higher education and empowerment increased women's odds of using contraception, empowerment being more robust than education to the introduction of socio-economic controls as wealth, place of residence and employment status. I also found that being affiliated with Christianism halved women's odds of using contraception, compared to women who were not following the Church's doctrine. The same results hold for the use of more effective contraception, which is increasing in education and empowerment and decreasing in religious affiliation.

Interestingly, as the odds ratios of using more or less effective contraceptive methods, compared to no methods, do not change significantly, I conclude that the predictors are more efficient in explaining contraception use than contraception effectiveness. This may happen because, though almost all women in the sample know a contraceptive method, not all of them can access the most effective ones. This has significant policy implications in a region where women have children when they are young and want to control fertility in the second part of their fecund years. On the one hand, improving women's education and empowerment, which lower monetary and psychic costs of contraception, requires specific efforts and structural policies from governments, especially in an area where inequality seems difficult to eradicate in the short term. In the majority of Latin American countries, however, the State has been reluctant to promote reproductive health programs, this causing small variation in contraceptive adoption and disparities in use based on socio-economic status. On the other hand, smaller gender inequality should be promoted within the household, as it brings more shared responsibility within the couple. When these institutional and household-level changes will be able to improve the quality of life of the population in reproductive years, guaranteeing access to effective contraception to every social class, the fertility schedule of all Latin American countries will converge to the one of the developed economies.

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Appendix

The three series of numbers in each Columns represent, respectively, the number of women not using contraception, the number of women using less effective contraception, and the number of women using more effective contraception.

Table A.1 Contraception use by categories of women (Colombia, Dominican Republic, Guatemala)

VARIABLES	(1) Colombia			(2) Dominican Republic			(3) Guatemala		
Education Level									
No education	138	53	102	54	10	35	1,130	382	454
Primary Education	740	525	1,442	350	107	417	1,665	2,517	1,024
Secondary Education	1,220	890	3,269	385	156	595	880	605	982
Higher Education	730	619	1,829	271	100	290	135	131	169
Religious Affiliation		-							
Christian				701	219	800	4,136	1,918	2,806
Non Christian				359	154	537	526	224	464
Empowerment									
Low	730	220	874	628	158	331	1,966	253	440
Medium	1,312	645	2,211	258	136	664	2,084	1,315	2,038
High	786	1,222	3,557	174	79	342	612	574	792
Cohort									
Young (15-29)	1,043	741	3,808	561	213	1,008	1,998	924	1,913
Old (30-49)	1,785	1,346	2,834	499	160	329	2,664	1,218	1,357
Employment status									
Employed	1,731	1,240	3,698	522	191	548	1,860	859	1,216
Not Employed	1,097	847	2,944	537	182	789	2,799	1,281	2,050
Wealth									
Poorest Quintile	892	585	2,064	261	70	396	1,224	384	617
Median Quintile	587	413	1,325	227	73	228	950	446	706
Richest Quintile	168	180	430	146	62	155	590	430	556
Place of Residence									
Urban	2,042	1,470	4,625	772	276	928	1,558	951	1,281
Rural	786	617	2,017	288	97	409	3,104	1,191	1,989

Table A.2 Contraception use by categories of women (Haiti, Honduras, Peru)

VARIABLES	(4) Haiti			(5) Honduras			(6) Peru		
Education Level									
No education	1,139	56	461	291	120	195	182	164	156
Primary Education	1,777	177	920	2,104	1,025	2,803	1,088	1,561	1,495
Secondary Education	1,202	276	595	853	410	1,301	1,154	1,822	1,987
Higher Education	101	61	32	138	85	186	570	1,090	763
Religious Affiliation									
Christian	3,932	541	1,836	3,022	1,484	3,884			
Non Christian	287	29	172	3,022	1,484	3,884			
Empowerment									
Low	1,219	79	285	1,981	271	790	1,462	476	509
Medium	2,026	317	1,106	1,097	977	2,688	433	1,024	983
High	974	174	617	308	392	1,007	1,099	3,137	2,909
Cohort									
Young (15-29)	1,559	249	921	1,480	682	2,680	1,906	958	1,805
Old (30-49)	2,660	321	1,087	1,906	958	1,805	2,149	3,244	2,466
Employment status									
Employed	2,206	305	1,166	1,567	652	1,702	2,140	3,143	2,704
Not Employed	2,013	265	842	1,819	988	2,783	854	1,494	1,697
Wealth									
Poorest Quintile	922	54	508	970	468	1,158	775	1,078	1,105
Median Quintile	952	123	507	676	304	902	626	1,049	999
Richest Quintile	682	183	206	425	252	560	331	531	387
Place of Residence									
Urban	1,709	346	716	1,273	587	1,664	1,864	2,886	2,591
Rural	2,510	224	1,292	2,113	1,053	2,821	1,130	1,751	1,810