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## Female Labor Force Participation in Latin America: Patterns and Explanations

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UNIVERSIDAD NACIONAL DE LA PLATA

## **Female Labor Force Participation in Latin America: Patterns and Explanations**

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# **Female Labor Force Participation in Latin America: Patterns and Explanations\***

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May 1, 2015

## **Abstract**

Female labor force participation has increased 10 percentage points between 1990 and 2010. This paper analyzes the possible determinants of this increase. Among those determinants are changes in education, family structure, fertility, as well as changes in socioeconomic environment including wages, returns to working at home, preferences, and technology, among others. We discuss the mechanisms behind those determinants by organizing the very large theoretical and empirical literature on the subject. We then assess the relative importance of the determinants in two ways. We compute treatment effects estimated in the literature and combine them with information about the changes in the causing variables. We also use data from household surveys and combine them with a dataset of determinants to find correlations in the data that reinforce or reject the analysis of the literature review.

JEL: J22, J16, N3.

Keywords: Female labor supply, Latin America, Determinants, Literature Review.

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# 1. Introduction

One of the most dramatic changes experienced in Latin America in the past half-century has been the annual increase in the proportion of women who decide to enter the labor force. The female labor supply in the region has increased by almost 10 percentage points in the past three decades. The increase was likely caused by a combination of several factors, ranging from education and fertility to technological and cultural changes. Our goal and main contribution is to assess the relative importance of a large set of factors that can explain female labor force participation dynamics in Latin America.

Identifying the contributions of individual factors presents a complex task because an individual's decision to work or not influences and is influenced by many events and conditions in that individual's life. Section 2 discusses a set of basic stylized facts through the lens of a general and simple conceptual framework that allows us to classify the so-called determinants of female labor supply into three categories. The first category concerns a group of interrelated choices that influence and are influenced by past, present, and anticipated labor force participation. These choices include decisions about education, marriage, and fertility. The second group of possible determinants is largely exogenous and outside the control of the individual. These determinants are socioeconomic environmental variables that have a central role in shaping individual-level interrelated decisions. Included in this category are the expected returns to education and to home production, the cultural context, and existing technologies in reproductive health, home production, and production of goods and services in the economy. The third group of determinants is less tangible and consists of decision-making arrangements. In theory, decisions about labor supply can be made individually or jointly with a spouse or family.

Section 2 also presents a set of salient empirical regularities of female labor supply in Latin America. First, there was a long-term increase in female labor force participation for all demographic groups. Second, this increase seems to have ameliorated in recent years, converging at a lower level than the one observed in developed economies. Third, female labor force participation is converging between demographic groups. Specifically, women in poor households are now behaving more like women in rich households, and unskilled women are behaving more like skilled women. This convergence has, however, stopped in recent years.

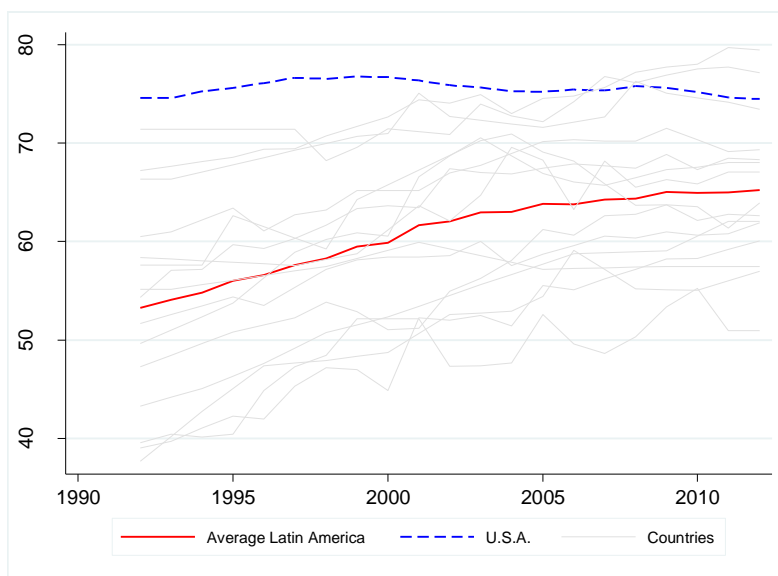
To what extent can a variety of determinants explain these empirical regularities? In Section 3, we discuss the mechanisms that underlie the effects of a variety of determinants of female labor supply and, by doing so, we organize the results of a vast relevant empirical literature on the topic. The empirical studies provide credible strategies for identifying causal mechanisms and combine these elasticities with changes in the key variables to assess the extent to which they can account for the stylized facts. In Section 4, we apply some of these plausible theoretical and empirical explanations to the data. Using household

surveys from 15 countries over a 30-year period, we build a panel of socio-economic and demographic indicators and estimate the correlation between female labor force participation and covariates that are linked to the explanations identified in the literature.<sup>1</sup> Section 5 concludes by taking stock of the plausibility of the main long-run determinants of female labor supply in Latin America.

## 2. Empirical regularities

Section 2 begins with a summary of some basic facts about the female labor supply as viewed through the lens of a simple conceptual framework. In 6.1 of the Appendix, we provide a full set of statistics that characterize female labor force participation in Latin America. Here, we focus on a few simple stylized facts. Figure 1 shows long-term trends in the labor force participation of females aged 25–54 years.

**Figure 1: Female labor force participation**  
Latin America and the US



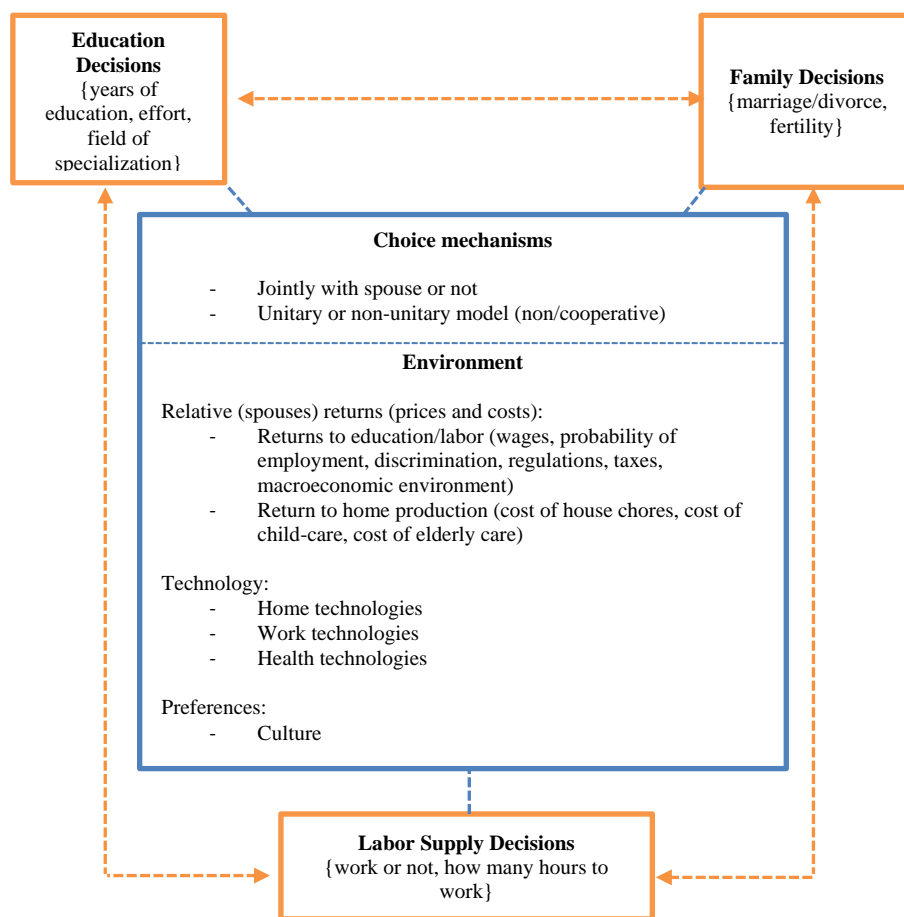
Source: own calculations based on microdata from national household surveys.

The solid line shows the simple average (arithmetic mean) of female labor force participation in Latin America, and the light gray lines indicate the corresponding level of participation in individual countries. As a reference, the dashed line shows the female labor force participation in the US. Three important facts can be derived from these data. First, female labor force participation in Latin America increased from 54% in 1990 to 65% in 2010. Second, there is some convergence among the individual countries (gray lines) in that countries with initially lower participation experienced faster rates of growth. Third, the

<sup>1</sup> This dataset is available at [www.matiabusso.org](http://www.matiabusso.org)

rate of growth in female labor force participation declined and almost stagnated after 2000. This plateau was achieved at a lower level than that in the US. As the gray lines indicate, only a few countries have reached the US level of participation, and in most countries, there is room for growth in participation.

**Figure 2: Interrelated decisions, choice mechanisms, and environment**



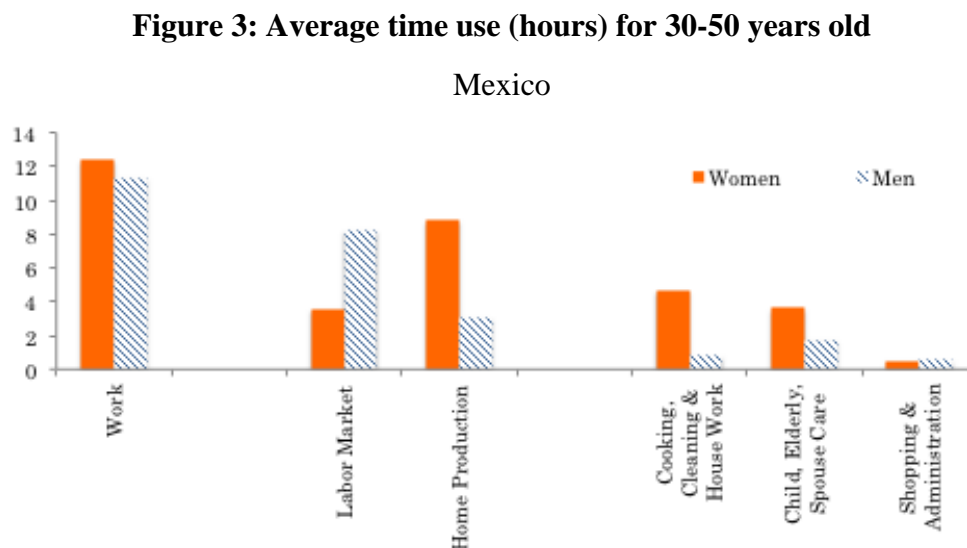
Why did the female labor supply increase, and why has it stagnated? A broad conceptual framework can help one understand the determinants of these phenomena. The labor supply is related to many factors, some of which are individual-level decisions made before or during a person's working age whereas other factors are outside the individual's control. Figure 2 provides a schematic view of both types of factors.

At any given time, the decisions to participate in the labor market and the number of hours to work involve choices that depend on the relative returns earned in the labor market compared to home production and the value of leisure.<sup>2</sup> Expected wages (earnings) depend

<sup>2</sup> The term "returns" has been broadly defined in this analysis. Moreover, it assumes the value of leisure is the same for men and women.

on the individual's productivity, whereas the value of home production is a function of the values of providing child care and elderly care services, housework (e.g., cooking or cleaning), and other home-based activities, such as home administration and shopping. Taking preferences as given, individuals facing a higher relative return from work in the labor market will be more likely to participate in it.

What do people in Latin America do when they are not working? Figure 3 shows the average number of hours a day used in different work activities for persons aged between 30 and 50 years in Mexico.<sup>3</sup>



Source: Author's calculation based on Encuesta Nacional sobre Uso del Tiempo Mexico 2009 (INEGI)

Women tend to work 12 hours a day, which is about 1 hour more than men. Women tend to work more hours at home (8.8 hours) than in the labor market (3.6 hours). The vast majority of women's working hours are spent on housework and child care tasks and caring for the elderly and their spouses. Thus, it is important to examine how technological changes can facilitate home production (e.g., home appliances) and how types of policy changes subsidizing child care may influence the labor supply. This *prima facie* simple static decision is much more complex when viewed through the lens of the life course. From that perspective, labor market participation is associated with several important choices. Figure 2 shows that these decisions relate to educational investments and family formations.

Individuals' choices regarding educational investments are typically made before they can fully enter the labor market, and they concern the quantity, quality, and type of education

<sup>3</sup> To the best of our knowledge, Mexico is the only country in Latin America that has collected time use data for a representative sample of men and women.

that individuals desire to obtain. In theory, higher and better quality of education should lead to more productivity and thus to higher returns in the labor market, increasing the labor supply. Some of the increase in educational levels could be exogenously due to governmental policies that reduce the cost of education and would be, therefore, unrelated to the (future) labor supply. However, a part of the increase in education could be the endogenous result of a larger proportion of women aspiring to work in the future and that will, therefore, obtain higher education today.

Choices about family formation are made before and during labor force participation. Decisions made during labor force participation include whether and when to marry/get divorced, whether and when to have children, and the number of children to have. Getting married somewhat changes the way that decisions are made (from personal when single to joint when married) and can lower the labor supply of one partner if the relative wages of the spouses differ widely. Similarly, bearing children directly influences women's labor supply during the first few months after the birth of the child. Moreover, it indirectly influences labor supply because it increases the opportunity cost of working outside the home, and in a context of different relative wage returns of partners in the household, it decreases the labor supply of the partner with the lower potential wage, usually the woman. Similar to education, observed changes in marriage and fertility rates could partly be due to exogenous changes in the environment, which are outside a woman's control (e.g., contraception). However, they might reflect women's endogenous decisions to participate in the labor force.

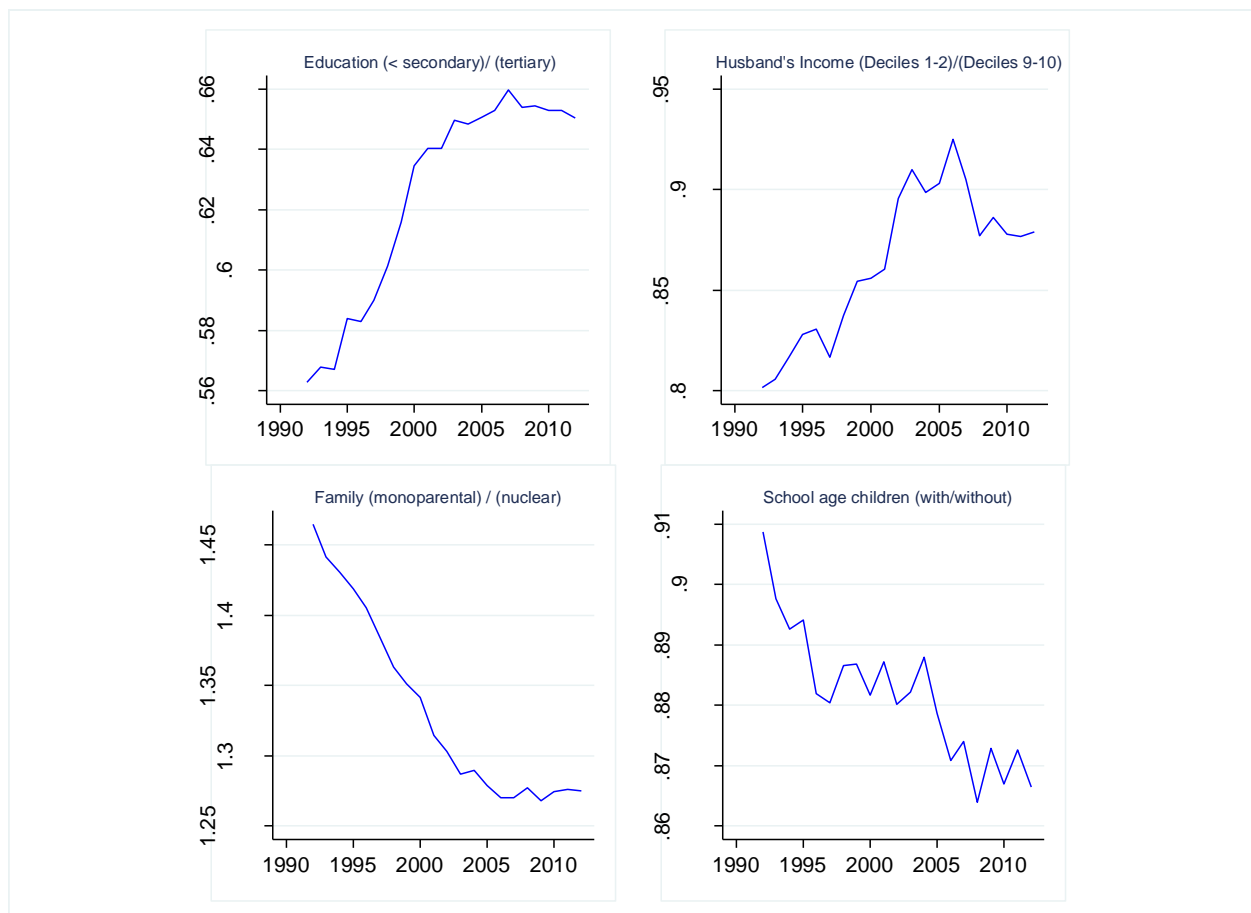
It is useful to compare the ways in which women in different demographic groups (by education, marriage, and fertility) supply labor. Between 1990 and 2005, the participation rates of women in disadvantaged groups caught up to those of women with relatively more advantages. However, the trend apparently abated in 2005, suggesting that some aspect changed for the more disadvantaged women, which could explain the plateau illustrated in Figure 1.

Figure 4 compares these two groups of women. Each panel in Figure 4 shows the ratio of female labor force participation between two groups with respect to a specific factor. The graph on the top left-hand side looks at education; between 1990 and 2000, the participation rates of the group that received less education become increasingly similar to those that received more education. However, by about 2000, the gap stopped closing; women with higher (tertiary) education showed increased participation, by 40%, in the labor force than those with less than a secondary education. Similarly, women whose husbands earned income was in the first 2 deciles of the distribution participated less than those whose husbands earned income was in the top 9-10 deciles (graph on the top right-hand side). Similar to the convergence in education, convergence with respect to husbands' incomes stalled in 2005. The graph on the lower left shows that women in single-mother households participated more than women in nuclear households (i.e., married mothers).



The labor force participations of these two groups seemed to converge until 2005. Last, the graph on the lower right presents a different pattern regarding women with school-age children; women with children aged 0–5 years tended to participate less than women with older school-age children. This gap is the only gap that increased during the period, suggesting that returns to home production actually increased.

**Figure 4: Ratio of female labor force participation**  
Latin America, by groups



Source: own calculations based on microdata from national household surveys.

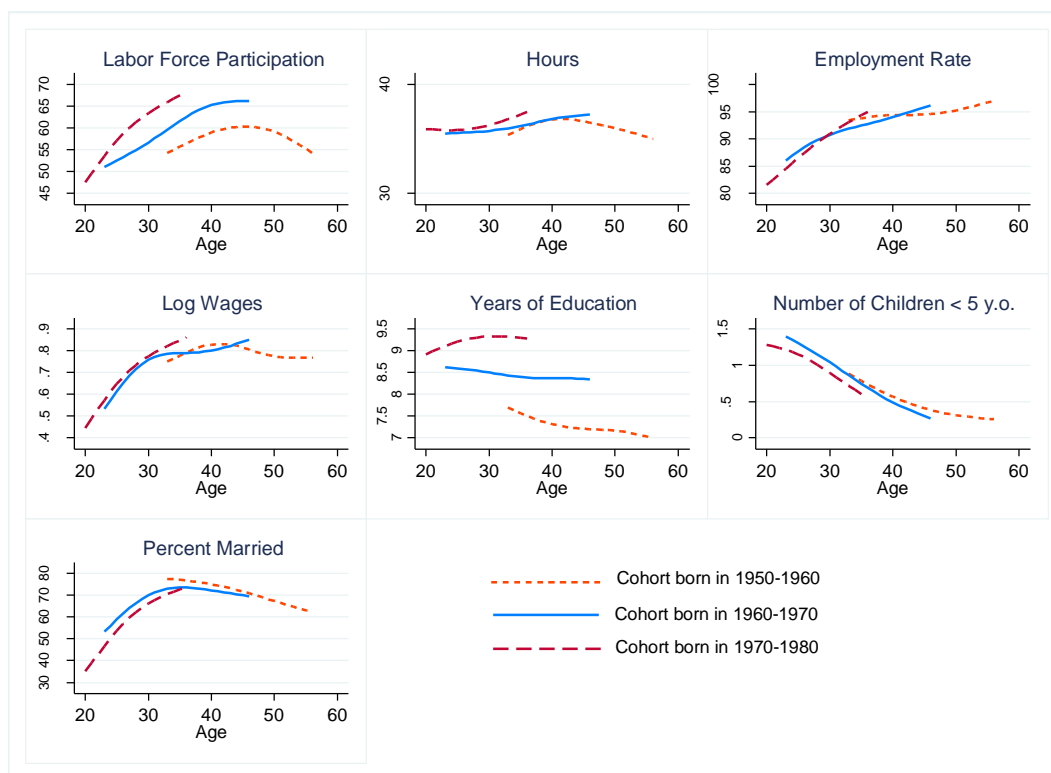
The interrelated decisions concerning education, family formation, and labor supply are influenced by two important factors: the arrangement in which the decision-making occurs and the environmental or social context in which the decisions are made. Choice mechanisms, or decision-making arrangements, differ in two respects. First, a decision about labor supply can either be made by the household as a unit (referred to as the unitary model) or by the spouses independently. However, scholars have rejected the unitary model (e.g., Lundber, Pollak, and Wales, 1997) in favor of models of intra-household bargaining. Second, decisions can be made cooperatively or non-cooperatively. For example, in some

models, the wife decides about her labor supply after the husband has decided about his labor supply, whereas in other models, the partners bargain in a noncooperative fashion. These different arrangements have implications for labor supply decisions. Heath and Tan (2014) found that, generally, all else being equal, decision-making arrangements that empower women more are more likely to yield higher levels of labor supply.

In addition, there are contextual aspects of the environment, largely out of the individual's control, that can influence labor supply, such as changes in returns to work for a wage, changes in returns to work at home, labor and health technologies, and preferences influenced by culture and religion. The environment influencing the labor supply tends to change slowly over time. To assess how changes in labor supply relate to changes in the environment, the first approach would be to examine the behavior of women born in different decades (i.e., different cohorts have different environments). Figure 5 presents seven graphs for three cohorts: (1) women born in the 1950s (dotted line), women born in the 1960s (solid line), and women born in the 1970s (dashed line). Each line is a (smoothed) average of all countries in Latin America. The x-axis plots age, and the y-axis plots a different variable in each sub-figure. Given that the data are available only for 1990 through 2010, different age ranges are observed for each cohort.

**Figure 5: Cohorts**

Latin America



Source: own calculations based on microdata from national household surveys.

The graph on the top left-hand side shows that younger cohorts tend to participate more in the labor force, and their participation seems to peak at younger ages. Interestingly, the action seems to be on the extensive margin (participation, shown in the graph on the top left) rather than on the intensive margin (hours worked) or on employment rates because the graph in the top central panel indicates that there is not much difference in the numbers of hours worked per week by women of different cohorts at the same ages. The labor market incentives do not seem to differ either. Clearly, the probabilities of employment and wages increase with age, but at any given age, women in different cohorts experience the same incentives. These results justify further investigation of the extensive, as opposed to the intensive, margins.

The three central sub-figures and the sub-figure on the lower left show that women in younger cohorts are more educated than those in older cohorts, tend to have fewer young children living with them, and tend to marry at older ages. In fact, the average number of years of education for females aged 20–60 years has increased over the past 25 years in Latin America, from about 6.4 years, on average, in 1986 to about 9.4 years, on average, in 2012. Overall, the long-term changes in labor supply were accompanied by changes in education, marriage, and fertility. These changes were likely generated by changes in the environment.

### **3. Determinants and mechanisms**

Section 3 describes the specific mechanisms through which various determinants, both endogenous (education and family formation) and exogenous (returns, technology, and preferences) influence labor supply. This is achieved by a review of the relevant literature and by providing, where possible, quantitative estimates of the effects of these determinants on female labor supply, to assess their relative effects.

#### **3.1. Education**

The first level of education, such as kindergarten or primary school, is the results of decisions made by parents. These decisions depend on their cultures, the availability of resources and infrastructure, policies in place regarding mandatory years of schooling, and conditional cash transfer programs, among other things. In many cultures, families invest less in their daughters' than in their sons' education. Glick (2008) argued that, holding other factors constant, daughters will receive less schooling than sons when: (1) parents expect to receive more money in the future from their sons than their daughters, (2) the marginal returns to schooling in the labor market are always higher for boys than for girls,

or (3) the marginal cost of schooling is always higher for girls. In addition, it is reasonable that providing more schooling to sons than daughters can arise from parents' preferences of valuing their sons' more than their daughters' human capital or of placing relatively more value on the future wealth of their sons.

Attaining an education beyond the mandatory level is believed to be mainly a result of women's decisions influenced primarily by expected higher returns, although the decision is also constrained by factors such as culture, resources, family support or opposition, and expectations. In recent decades, women's increased investments in education have been so dramatic that the education gender gap was reversed in Latin America as well as in many developed countries (Chioda, 2011). Because returns to education are positive, this increase in educational attainment induced an increase in expected wages, and therefore, in the opportunity cost of not working. In other words, it is expected that these increases in educational attainment will be accompanied by increases in female labor supply. However, causality can work in both directions: Women may be more likely to work because they are more highly educated; alternatively, they may advance their education because they aspire to work in better positions or for a higher pay.

Indeed, many studies have found that higher expected returns in the labor market may drive schooling decisions. Foster and Rozensweig (1996) examined the green revolution in India, which generated an increase in the returns to primary school during a period of rapid technological progress, which, in turn, induced private investment in primary schooling. Similarly, using experimental evidence, Jensen (2012) assessed an intervention, also in India, that changed employment opportunities for women. He provided three years of recruiting services in randomly selected rural Indian villages to help young women obtain jobs. Young women in villages that received the service were significantly less likely to get married or have children, choosing instead to enter the labor market, attain higher education, or attend post-degree training.<sup>4</sup>

There are many reasons, not directly related to labor force incentives, for women to be more educated than men. First, some scholars have proposed that women increase their education because they want to improve their marriage prospects (Greenwood et al., 2012). Second, in a labor market that discriminates against women, women get more education precisely to avoid that discrimination because the extent of discrimination is negatively related to educational attainment (Chiappori et al., 2009). Third, women may increase their

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<sup>4</sup> A growing expanse of literature argues that expected (perceived or subjective) returns influence schooling decisions. Kaufmann (2009) used a survey of perceived returns among high school graduates in Mexico to study the determinants of college attendance. She concluded that although expected returns and perceived risks from human capital investment were important determinants, lower returns or higher risks were insufficient to explain poor people's low rates of attendance. Using the same data, Attanasio and Kaufman (2012) investigated the relationship between subjective expectations and schooling decisions. The authors found that individuals' subjective expectations about their future incomes and employment influenced their decisions regarding higher education.

educational attainment because of recent changes in identity and a weakening of traditional values and norms. That is, women invest in education because of aspirations and changes to role expectations (Akerlof and Kranton, 2000).

Have changes in educational attainment caused changes in the labor supply? Unfortunately, there is limited evidence with which to answer that question because labor supply and education are generally considered to be a joint decision, which makes it difficult to separate their effects on each other.

### **3.2. Marriage**

Marriage can influence the labor supply by changing the relative returns of working inside versus working outside the home. Married women with children tend to participate less in the labor market than single women because the former have an alternative source of income (which raises their reservation wage) and a higher opportunity cost of working outside the home. In fact, married women's labor supply elasticity is greater than that of married men (Blau and Kahn, 2005). In the US, McClelland and Mok (2012) found a substantial reduction in the labor supply elasticities of married women over the past three decades, although they were still higher than the elasticities of men or unmarried women.

Who women marry also may influence differences in their labor supply in different regions of the income distribution. Studies have extensively analyzed the higher likelihood of marrying, or more generally, forming a family with someone similar with respect to characteristics such as educational attainment and income. This phenomenon is termed "assortative mating," and these studies often focus on women's labor patterns according to their husbands' incomes.

There are two extreme cases of mating: random mating, in which all the members of the population marry at random, and perfect sorting, in which all the members of the population marry someone from their income decile). In random mating, women's wages relative to men's are, on average, lowest for the wives of top-wage husbands. Therefore, these wives work the fewest hours, and the relationship of wives' hours worked and husbands' wages is negative. In the case of perfect sorting, with the presence of a gender wage gap that favors men, wives' wages are increasing and concave<sup>5</sup> relative to the husbands' wages, as are wives' hours worked. Between these two extremes, some marry at random and some marry someone from their decile, and in this case, we can expect the observed inverse-U relationship between wives' hours worked and husbands' wages decile that was seen in the 1990s. Bredemeier and Juessen (2013) performed a quantitative analysis of this model and found that the growth in women's wages and the decline in fertility were the main drivers of the overall increase in wives' hours worked since the

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<sup>5</sup> This scenario assumes a constant gender wage gap.

1970s. Specifically, they argued that the largest increase in wives' hours worked was among those women who were married to high-wage men and, therefore, labor supply increases were a consequence of the positive trends observed in assortative mating since the 1970s.

Legal divorce also may provide an incentive for women to increase their labor force participation. When women are faced with the possibility of losing their source of income to divorce, they have an incentive to generate income on their own by participating in the labor market. Hence, the legalization of divorce has been observed as a natural experiment to find a causal link between the likelihood of divorce and female labor force participation. Bargain et al. (2012) employed the legalization of divorce in Ireland in 1996 as a natural experiment to analyze the effects of an exogenous increase in the perceived risk of marital dissolution on female labor supply. Using a control group of families with a low risk of dissolution, the authors estimated via a difference-in-difference model that the legalization of divorce significantly increased labor supply in the extensive margin, although it was not increased in the intensive margin. This finding is consistent with the notion that women want an external option when faced with the risk of divorce. Having a job, whether part-time or full-time, gives women access to social networks and a potential remarriage market while helping them to maintain human capital levels. Bargain et al. (2012) found that a 1% increase in the risk of marital breakdown increased labor supply by about 0.20 hours per week and female labor force participation by 0.50–0.80 percentage points.

### **3.3. Fertility**

Having children naturally influences mothers' ability to work, at least during the period of childbirth and recovery, which can last from a couple of days to a few weeks. After recovery, babies and small children require a substantial amount of care, which influences parents' labor supply. How do parents decide how much to work when they have children compared to people who do not have children? Lundberg (1988) found that there are strong interactions in the labor supply decisions of each parent when couples have preschool-aged children. That is, the hours that the parents work are jointly determined. However, when there are no young children, the hours worked by husband and wife are apparently independently decided.<sup>6</sup>

Joint modeling of individuals' decisions about fertility and employment requires complicated techniques. Francesconi (2002) used data on married women in the US to estimate fertility and labor supply decisions. The study found that women that interrupted their fulltime employment for 5 years experienced utility loss of about 1.5% per year over a

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<sup>6</sup> For a couple with children younger than age 6 years, an increase in the husband's earnings tends to reduce the labor supply of the wife; if the husband's monthly earnings increase by USD 100, the wife's hours fall by 6–9 hours per month.

20-year period, provided they reentered fulltime employment after the interruption. Shorter interruptions were associated with smaller losses.

The literature has tried to quantify the impact of childbearing on female labor supply. Angrist and Evans (1998) used parents' preferences for a mixed sibling-sex composition as a source of exogenous variation in fertility and found that the effect of the change from a two-child to a larger family reduced women's labor supply by about 10.4%, on average, in the US in 1980. In 1990, the change to a larger family reduced it by 8.4%, and the labor market consequences of childbearing were likely to be more severe for poor and less educated women. However, having fewer children does not necessarily mean an increase in women's labor force participation. Priebe (2010) employed the same instrument as Angrist and Evans (1998) in an Indonesian sample and found that having fewer children does not relate to an increase in labor supply because Indonesian women work primarily to cover child costs and fewer children means they need to work less.

Cruces and Galiani (2007) also followed Angrist and Evans (1998) and used the preference of parents for a mixed sibling-sex composition in a study of two middle-income Latin American countries: Argentina and Mexico. They found a statistically significant negative effect of more than two children on the mother's labor supply. In Argentina, the reduction was about 8.1–9.6 percentage points (for married women; in Mexico, the reduction was about 6.3–8.6 percentage points (for married women. Tortarolo (2014) tested the same instrument as Angrist and Evans (1998) using a large sample of census data spanning three decades from 14 Latin American countries and the US (1980s, 1990s, and 2000s). Using 39 censuses, they applied ordinary least squares estimations and found a statistically significant negative relationship between fertility and mothers' labor supply in each of the 14 Latin American countries.<sup>7</sup>

Another set of studies used fertility shocks, such as infertility and miscarriage, as exogenous sources of variation to find the causal effect of childbearing on women's labor supply. Cristia (2008) found that when the first child was less than a year old, those mothers who had sought medical intervention to conceive had reduced employment by 26 percentage points compared to mothers who had not sought medical intervention. Agüero and Marks (2011) used self-report infertility shocks among women in 26 developing countries as a source of exogenous variation in the number of children. They found that the effect of having children on labor force participation was not significant for mothers' overall labor force participation, but it did decrease the likelihood of paid work, particularly among younger women and in relatively poorer countries. Among younger women, an additional child reduced paid employment by almost 2 percentage points, and in low-

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<sup>7</sup> In Sweden, Angelov et al. (2013) compared women's incomes and wage trajectories to those of their male partners' before and after parenthood. Focusing on the within-couple gap, the study found that 15 years after entering parenthood, the gender gap in income had increased by 18 percentage points, and the gender gap in wages had increased by 10 percentage points, compared to the pre-child levels. Parenthood influenced men and women differently, causing persistent gaps in labor market returns within households.

income countries, an additional child reduced women's paid employment by 2.1 percentage points.<sup>8</sup>

The timing of childbearing also seems to affect labor supply. Having children in the later stages of a career may make it easier for women to return to their previous employment positions. Using the exogenous variation in birth timing induced by miscarriage and other negative fertility shocks before the first birth, Miller (2011) found positive effects of delayed motherhood on earnings and wages. Specifically, there was a substantial increase in earnings of 9% for each year of delay, an increase in wages of 3%, and an increase in work hours of 6%, with college-educated women and those in professional and managerial positions reaping the largest advantage. Postponing motherhood may reduce the career costs of children because later interruptions imply that the foregone investments are accrued over a shorter time horizon.

Fitzenberger et al. (2013) calculated the amount of employment lost for bearing children now instead of later in Germany, a country that provides a lengthy maternity leave. They found that, in terms of cumulative employment losses measured in person-months, during the first five years after birth, an average of about two years (23 months or 38.5% of the total time) in employment is "lost" as a result of the birth of a child now instead of later. The employment loss is reduced over the first five years after childbirth, but it does not level off to zero at the end of that period.

### 3.4. Technology

*Health Technologies.* The introduction of the hormonal contraceptive (birth control) pill is a technological advancement that enabled women to control the quantity and timing of their children. Goldin and Katz (2002) argued that the direct effect of the pill was a decrease in the cost of remaining unmarried to women while they were investing in their professional careers. The pill reduced the cost of career investment for women by increasing age at first marriage. Bailey (2006) used the variation in US state laws allowing women under the age of 21 to obtain oral contraception without parental consent to estimate the impact of pill access on female labor force participation. She found that, from 1970–1990, early access to the pill can account for about three of the 20 percentage point increase (14%) in labor force participation rates and 15% of the increase in annual hours worked by women aged 16–30 years.

Albanesi and Olivetti (2009) studied the effects of technological progress in health and nutrition on reductions in the cost of childbearing. They found that, in the early 1900s,

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<sup>8</sup> They found no significant effects for middle-income countries, a finding that differs from that of Cruces and Galiani (2007), who showed that women in Mexico and Argentina with more than two children borne out of a preference for a balanced sex mix were less likely to participate in the labor force. This difference was mainly due to the differences among subpopulations.



women spent more than 60% of their prime childbearing years either pregnant or nursing. However, between 1920 and 1960, there were advancements in medical knowledge and obstetric practices that, together with the introduction of infant formula, reduced the time cost of raising children and led to an increase in the labor supply of young married women with children. Better maternal health decreased the adverse effects of pregnancy and childbirth on women's abilities to work, and the introduction of infant formula reduced the comparative advantage of mothers in infant feeding.

Abortion laws are another example of the availability of a health technology that allows women to decide if and when to bear children. Kalist (2004) examined whether the liberalization of US state abortion laws influenced female labor force participation with several probit participation equations. The results indicated that by reducing unwanted pregnancies and hence, fertility rates abortion increased the labor force participation rates of females, particularly the rates of single black women. Other studies have explored the effects of fertility on female labor supply using the legalization of abortion as an instrument. Angrist and Evans (1996) studied the effects of teenage and out-of-wedlock childbearing on the schooling and employment statuses of black women using measures of exposure to the 1970s' abortion reform in US states as instruments. They found that black women who were exposed to abortion reforms experienced large reductions in teenage fertility and teenage out-of-wedlock fertility that apparently increased educational attainment and employment rates; there was no statistically significant effect for white women.

Most studies on the effects of abortion focus on the US because several laws have legalized abortion since the 1970s, providing data both before and after the laws were enacted. The situation in Latin America is somewhat different. In this region, the only country that has fully legalized abortion is Uruguay, where women have been able to legally obtain an abortion on request since 2012.<sup>9</sup> For most of the remaining Latin American countries, abortion is legal only when it is necessary to protect the health of the mother. Some countries, such as Chile, El Salvador, Honduras, and Nicaragua, prohibit abortion under any condition, and persons performing the procedure are penalized.

*Home Technologies.* Traditionally, women are primarily responsible for household chores, which reduces their time available for working outside the home. In this context, technological progress in household production frees up women's time and could drive an increase in the female labor supply. Studies have found that the female labor supply is influenced by technological progress in the home and the health and nutrition sectors. Thanks to technological progress, women are able to perform their traditional housekeeping and child care duties in less time. Moreover, these technologies reduce women's comparative advantage for fulfilling these traditional roles.

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<sup>9</sup> Since the policy change is so recent there is, to the extent of our knowledge, no available study that estimates the impact of this change on demographics or economics outcomes.

Using household appliances reduces the time required to perform many household chores such as cooking, washing clothes, and cleaning. Greenwood et al. (2005) and Greenwood and Seshadri (2005) argued that the introduction of household appliances such as the refrigerator, vacuum cleaner, washing machine, dryer, microwave oven, and dishwasher, liberated women from home because they allowed women to save time in home production, which enabled them to enter the labor market. Greenwood et al. (2005) found an important decrease in the time that women spend performing housework tasks, from 58 hours per week in 1900 to 18 hours per week in 1975, which helped married women with children enter the work force. The authors found that in 1900, about 5% of married women worked in the labor force. By 1980, it had increased to about 50%, and more than half of that increase was due to the technological advancements in the household sector. Similarly, Coen-Pirani et al. (2010) tested the hypothesis that the diffusion of household appliances in the 1960s increased the labor force participation of married women. Using US census data, they found that owning three household appliances (specifically, a washer, dryer, and freezer) increased the likelihood of married women participating in the labor force by about 27 percentage points between 1960 and 1970. Dinkelman (2011) found that five years after rural electrification in South Africa, female employment had increased by 9 percentage points (almost 30% from the baseline), freeing up women from activities associated with home production.

Besides the advent of household appliances, their prices may determine whether they are actually purchased, thereby influencing the female labor supply. Cavalcanti and Tavares (2008) found that decreases in the prices of home appliances significantly increased female labor force participation. A 20% decrease in the relative price of appliances (i.e., the ratio of the price of the appliances to the consumer price index) increased labor force participation by 2%–3%, on average. In the case of the United Kingdom, between 1975 and 1999, the decrease in the relative price of home appliances accounted for about a 10%–15% increase in female labor force participation. Similarly, Cubas (2010) studied the differences in female labor force participation in Latin America and the US between 1990 and 2005. The results showed that prices of household appliances and access to infrastructure were important for explaining cross-country labor supply differences.

*Work Technologies.* Goldin (2014) proposed that convergence between men and women in the labor force requires job flexibility; that is, changes in the labor market determine how jobs are structured to enhance temporal flexibility. The gender gap in pay would be reduced if employers did not disproportionately reward employees who work long (or particular) hours. In fact, the diffusion of work technologies could influence female labor participation because these technologies allow for “telework” (working from home via the Internet) and flexible schedules. Dettling (2014) examined the ways that Internet use influenced the labor force participation of married women and found that high-speed Internet use increased their labor force participation by an average of 4.6 percentage points, with larger increases

among women with higher educational attainment and children. The primary connection between Internet use and labor market outcomes is telework; Internet use, through telework opportunities and flexible scheduling, has particularly benefited highly educated women's participation in the labor force.

### **3.5. Labor market returns: discrimination**

Female labor force participation is influenced by the prospects of earnings in the labor market. A key factor that affects the relative returns of males and females is discrimination. If a woman perceives that her wage will not be high enough to compensate her for what she expects to give up to perform that job, or if she perceives that she is being paid less than a man for equivalent work, she might decide to not participate in the labor market. In addition, because discrimination affects women's wages relative to men's, discrimination affects women's decisions about specialization in home versus work production within the household.

What are the sources of this type of discrimination? Childbearing hinders women's labor force participation, at least, during the childbirth and recovery period. When an employer considers hiring a woman or a man with equivalent qualifications, the assumption that the woman has relatively greater potential for absences from the job can be detrimental to the woman's job prospects. Similarly, if an employer must invest in workers' training and believes that women are more likely than men to terminate employment, he may prefer to hire men (Neumark et al., 1996). Correll et al. (2007) found biases against mothers that influence the evaluations of their competence and commitment and whether they are hired, promoted, or receive a raise. These evaluative biases are mostly unjustified because, according to Correll et al. (2007), the majority of studies found no significant differences between mothers and non-mothers in the extent of their commitment, and the discrimination arises from perceptions.

Two main approaches are used to quantitatively assess the existence and magnitude of wage discrimination: decomposition of wage gaps (combined with regression analysis) and field experiments.

*Decomposition of Wage Gaps.* The most commonly used decomposition method is the Oaxaca–Blinder decomposition method, which statistically differentiates the portion of the wage gap corresponding to each observable factor (e.g., education, job experience, age, or race, and so on). The portion left unexplained by these observable factors is associated with discrimination.

To study the gender wage gap around the world, Weichselbaumer and Winter-Ebmer (2005) performed a quantitative systematic review (meta-analysis) of more than 260 published papers covering 63 countries from the 1960s through the 1990s. They found that, during the study period, the raw wage differentials decreased significantly, from about 65%

to about 30%, with most of the decline attributed to women's labor market endowments (higher educational attainment, training, and work attachment). The authors specified a standardized gender wage gap with the standardizing data selection and econometric method, and they found that the ratio of what women would earn, if there were no discrimination relative to their actual wages, decreased by approximately 0.17% annually, indicating that moderate gender equalization between wages was occurring.

Additionally, Weichselbaumer and Winter-Ebmer (2005) stressed the importance of statistically controlling for certain observable characteristics to reduce the bias in the calculation of the discrimination component of the gap. Missing or imprecise data on human capital factors, such as work experience, on-the-job training, or job tenure with the actual employer can result in important biases in the calculation of the unexplained component. For example, the researchers found that studies that did not account for work experience had greatly overestimated the unexplained portion of the gender wage gap.

For 18 countries in Latin America,<sup>10</sup> Hoyos and Ñopo (2010) calculated the gender earnings gaps between 1992 and 2007, using a different decomposition method. During that 15-year span, the overall wage gap declined from 16.32%–8.85% of average female wages, which represented a significant decrease of about 7 percentage points. The unexplained component decreased about 3–4% (a statistically significant result), depending on the characteristics for which the authors conducted the statistical adjustment. They found important heterogeneities across countries; for instance, Brazil showed the widest gap but was also closing the gap the fastest.<sup>11</sup>

*Field Experiments.* There are substantial differences favoring men over women in pay and promotion. Even after controlling for demographic and socioeconomic characteristics, women earn significantly less and are less likely to be promoted to top-ranking positions. One potentially important reason for these differences is that men and women may respond differently to competitive environments. Antonovics et al. (2004) used data from a competitive television game show to mimic some competitive aspects between men and women in the labor force and assessed whether men and women of similar skill levels perform equally well in competitive environments. They found that in situations of direct competition, men outperformed their female opponents more than 72% of the time, and

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<sup>10</sup> The countries they examined were Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Paraguay, El Salvador, Uruguay, and Venezuela.

<sup>11</sup> Much of the relevant literature associates the unexplained portion of the wage gap with discrimination. However, some authors have pointed out that “residual discrimination” would only measure the extent to which the gap is caused by unobservable factors besides discrimination. Therefore, these measures of discrimination using these types of decompositions are biased because of the lack of relevant controls. The estimations of the gender gaps do not include many control variables that measure characteristics such as abilities, educational attainment, and family environments, or factors such as preferences for non-market activities, which could be a determinant unobservable factor of the female labor supply in Chile (Bravo et al., 2008).

ability explained no more than about 27% of this differential. Even after controlling for ability, the men outperformed the women in competitive settings.

Experiments have also been used to test for the presence of gender discrimination in hiring. The most popular experiments are the audit experiments, where resumés presenting equivalent qualifications but changed genders and names are used to apply for jobs. When the names alone are changed, the results provide an unbiased estimate of discrimination at the hiring stage (Booth and Leigh, 2010). In Latin America, Bravo et al. (2008) implemented an experiment to determine the presence of gender discrimination in hiring. The experiment used fictitious resumés to apply for real jobs. The resumés presented equivalent qualifications and job experience, but they differed in terms of the fictitious applicant's gender. The researchers found that men and women apparently have the same probability of being called for a job interview because the callback rates in response to the resumés were 14.9% for the male names and 14.6% for the female names, and the difference was not statistically significant. This lack of a significant difference in the callback rates differs from the findings of previous studies, perhaps because these findings are limited to the first step in the hiring process, the callback. Discrimination in hiring may occur at the second or third callback or when the final hiring decision is made.

### **3.6. Labor market returns: macroeconomic crises**

The two likely changes in the labor market during a macroeconomic crisis are an outward shift of the aggregate labor supply curve and an inward shift of the aggregate labor demand curve, which would result in a decline in real wages. However, the net effect on employment is theoretically ambiguous because it would depend on the relative size of the shifts and the elasticities of both curves.

Economic crises affect employment and labor market returns for both genders. Stotsky (2006) found evidence suggesting that women's employment is more resilient than men's during a recession in many countries. There could be many factors underlying this phenomenon. For example, male-dominated occupations, such as the construction industry, are more cyclical and more responsive to recessions. Furthermore, women are relatively more likely to work in fast-growing industries, such as the service sector, that may be relatively more resistant to recessions. Additionally, Stotsky (2006) pointed out that these differences might reflect differences in participation rates by gender, particularly if women are more likely than men to leave and re-enter the labor force as working conditions change.

What exactly is the influence of a crisis on labor force participation? Using a panel of 86 countries and data for the period 1980–2005, Signorelli, Choudhry, and Marelli (2012) found that financial crises are related to small but statistically significant reductions (0.829 percentage points) in female labor force participation. Analysis on a sample of 10 upper-

middle-income economies<sup>12</sup> that included 6 Latin American countries showed that financial crises led to a reduction of 2.5 percentage points in female labor force participation. In a sample of 20 lower-middle-income economies<sup>13</sup> that included 9 Latin American countries, they found no statistically significant effects of financial crises on female labor force participation.

An economic crisis causes a resulting reduction in household income. In response, households want to increase their labor force participation and hours worked despite the labor demand constraints induced by the crisis. For example, the 2002 Argentine financial crises primarily caused a considerable fall in real wages, which was accompanied by little increase in labor supply due to weak labor demands (McKenzie, 2003a). There was no statistically significant effect on female labor participation. Regarding the 1995 Mexican peso crisis, McKenzie (2003b) found that households used reductions in fertility and primary health care investments as financial coping mechanisms instead of adding workers to the labor force or increasing existing workers' hours because during this aggregate shock, there were labor demand constraints.

During a recession, if the husband is the primary earner and loses his job, the wife can enter the labor force and then later exit it when the primary earner is reemployed. This is referred to as the "added worker effect," and it can be interpreted as a household strategy against unemployment shocks during economic crises. Cerruti (2000) found evidence of the added worker effect in Argentina, where the increase in female labor force participation is not due to improvements in the conditions of the labor supply or the broadening of opportunities available to women. Instead, it is mostly a response to increasing instability and unemployment among male primary earners associated with the implementation of structural adjustment policies since 1991. Cerruti's (2000) main contention is that women decide to participate in the labor market to reduce the economic uncertainty of the household.

The global economic crisis of 2008 was similarly associated with an increase in female labor force participation and a decrease in male labor force participation. This crisis induced a negative income shock to households, and labor supply had to be adjusted accordingly, with the possibility of the emergence of the added worker effect. Khitarishvili's (2013) study of a sample of 28 Central and Eastern European and former Soviet Union countries provides evidence of the added-worker effect in 2010 because married women whose husbands lost their jobs increased their labor force participation by 10.5 percentage points.

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<sup>12</sup> The countries were Argentina, Chile, Costa Rica, Jamaica, Malaysia, Mexico, South Africa, Turkey, Uruguay, and Venezuela.

<sup>13</sup> The countries were Algeria, Bolivia, Cameroon, China, Colombia, the Dominican Republic, Ecuador, Egypt, El Salvador, Guatemala, India, Indonesia, Jordan, Morocco, Nicaragua, Paraguay, Peru, the Philippines, Sri Lanka, and Thailand.

### **3.7. Policies: labor market regulations and taxes**

When discussing the effects of labor market regulations, it is important to remember that most studies about labor laws are set in developed countries, which likely have higher enforcement powers than developing countries.

*Minimum Wage.* Governments mandate minimum wages, targeted at low-wage earners, to assure these workers a basic standard of living. A higher minimum wage potentially creates incentives for women to participate in the labor market because it could make working for a wage relatively more attractive than home production (Boeri et al., 2008). Since women tend to populate low-earning occupations, the regulations that affect minimum wages are particularly important to women. Moreover, minimum wage laws improve women's wages relative to those of men's because there are more women at the bottom of the wage distribution (Jaumotte, 2003).

The literature about minimum wage has focused on its effects on employment; scant attention has been paid to its impact on labor force participation (Boeri et al., 2008). Another limitation in the literature is that studies rarely consider employers' possible substitution of non-cash for cash compensation as a way of avoiding the minimum wage requirements (Boeri et al., 2008). Regarding the effects of minimum wage on employment, Neumark and Wascher (2007) reviewed more than 100 empirical studies. Focusing on the most methodologically robust studies (85% of the total), they found a small negative effect of minimum wage on employment level. These results suggest that minimum wage apparently has been set at a level modest enough to not have an important influence on female employment (Jaumotte, 2003).

*Parental Leave.* Maternity leave is a benefit provided by all the Latin American countries in our sample. In the majority of the countries, maternity leave benefits paid to the worker are financed mostly by governmental social security. In our sample, the countries that provided the longest maternity leave were Venezuela and Chile (18 weeks), while Honduras provided the shortest leave (10 weeks). In addition, paternity leave is provided by 8 of the 15 countries in our sample. Venezuela provides the longest paternity leave (14 days). Even when parental leave is funded by general tax revenue, the asymmetry between the lengths of paid maternity and paternity leaves generates a differential cost to employers when hiring men and women. This difference arises because with respect to the birth of a child, women are absent from their jobs longer than men, which means that the cost of hiring women is higher than the cost of hiring men.

A review of empirical studies about the effects of maternity leave in Europe, the US, and Canada found that, over time, there has been an increase in women's labor force participation before childbirth, an increase in the probability that a woman returns to the

same employer after maternity leave, and some negative effects on wages (Boeri et al., 2008).

Blau and Kahn (2013) found that so-called family-friendly policies in OECD countries (e.g., parental leave, part-time work entitlements, and child care policies) increase female labor force participation and reduce the gender gap in labor force participation. The expansion of these policies explained about 28% of the decrease in US women's labor force participation relative to the corresponding values in other OECD countries (Blau and Kahn, 2013). However, the types of jobs at which American women work differ from women's jobs in other OECD countries. Those policies seem to incentivize women to work part time and at lower level jobs compared to women in the US (Blau and Kahn, 2013).

*Taxes.* Scholars generally agree that payroll taxes reduce formal employment in developing countries. In theory, the extent to which employment is influenced depends on how much of the amount (or proportion) of payroll tax can be passed on to the workers in the form of lower wages (Kugler and Kugler, 2009). The bulk of the empirical evidence concerns the effects of taxes on employment and wages; studies about the effects on labor force participation are rare and mostly set in developed countries.

Heckman and Pagés (2003) found that payroll taxation in Latin America tended to reduce employment and increase unemployment rates. In Colombia, for instance, a 10% increase in payroll taxes in 1993 reduced formal employment by between 4% and 5% (Kugler and Kugler, 2009).

Some countries, such as the US, offer a lower effective income tax rate to married couples (compared to single individuals), which is linked to the joint taxation of the couple. However, most countries tax individuals' incomes. Guner et al. (2012) found through simulation exercises with US data that a reform that changes taxation from joint filing by married couples (the current system) to separate filing (individual taxation) influences the labor supply. A transition from the current system to separate filing would increase the labor force participation of married women by about 10.4%, and it would increase by 18.1% for married women with children. In the intensive margin, the aggregate hours worked by married women would increase by about 11.4%. The authors proposed that such a big change would occur because separate filing would greatly reduce the tax burden associated with female labor force participation (Guner et al., 2012).

Using US-based data, Eissa (2002) found that, after the Tax Reform Act of 1986, which reduced the marginal tax rate paid by high-income married women by about 40%, the labor supply of this category of women increased by about 90 hours per year. The hours worked elasticity of high-income women with respect to the after-tax wage was estimated to range from 0.6–0.8, with almost half the total elasticity attributed to labor force participation (Eissa, 2002).



Similarly, van Soest and Stancanelli (2010) found that a transition from joint to separate taxation for married couples would increase women's labor force participation by 0.20 percentage points and their hours worked by 3.21%.

### **3.8. Policies: Conditional Cash Transfer (CCT) Programs**

Conditional Cash Transfers (CCTs) are intended to help children build human capital through educational enrollment, consistent school attendance, and periodic health checkups. CCT programs target the poorest households, which are geographically located mostly in rural areas. The household member who receives the cash transfer tends to be the mother of the target child because policymakers generally believe that mothers are more likely than fathers to promote children's wellbeing based on their different preferences and priorities.

Mexico's *Progresa* (now *Oportunidades*) Program is one of the first CCT programs in the world. It was launched in the 1990s, and there is evidence of its success at reducing poverty and increasing children's schooling. Since then, many other Latin American countries, such as Brazil, Nicaragua, Honduras, Guatemala, the Dominican Republic, Peru, and others, have implemented CCTs as part of their poverty reduction strategies.

Economic theory does not predict an unequivocal effect of CCTs on labor force participation. On the one hand, there might be a negative effect on labor force participation, which can be explained by three reasons. First, when people receive unearned income, they have less incentive to work (due to disincentives to work through an income effect). Second, compliance with the conditionalities that require school attendance and periodic health examinations may be time-consuming, which may reduce the amount of time available for work or leisure, particularly for women. For example, Parker and Skoufias (2000) found that many women in the *Progresa* Program reported spending their time transporting children to schools and clinics. Third, there may be a price effect; the CCTs' beneficiaries may believe (correctly or incorrectly) that to remain eligible for a means-tested CCT program they need to work less to remain poor (Fiszbein et al., 2009). On the other hand, CCTs can have a positive impact on labor force participation. First, because the CCTs' conditionalities require children to attend school, time that their mothers had previously allocated to child care becomes available for work outside the home. Second, when children attend school, they cannot work as much, which decreases household income and increases the demand for income (generated by work) from adult household members. However, the strength of this relationship depends on the amount of the children's unearned income relative to total household income.

This review focuses on the adult female labor supply, but it is important to describe the ways in which CCTs influence child labor because they have implications for human capital accumulation, and thus, future labor market outcomes. The condition of the CCT mandating school attendance reduces households' costs of schooling, which tends to

increase the likelihood of schooling and the reduction of child labor (Parker and Skoufias, 2000). Moreover, mandating schooling as a condition may encourage parents to assign more value to education, and hence, decrease their children's labor. The fact that the CCT increases households' incomes necessarily lessens households' dependence on children's income from work and decreases the children's labor (Fiszbein et al., 2009).

Empirically, most studies have found a reduction of child labor caused by CCT payments. Edmonds and Schady (2012) found that, in Ecuador's *Bono de Desarrollo Humano* Program, a cash transfer less than 20% of the median child labor earnings significantly reduced child labor activities. The children in households that were induced to participate in the Program experienced reduced paid employment by about 78% and unpaid economic activities inside their home by about 32%.

Parker and Skoufias (2000) found that Mexico's *Progresa* Program reduced child labor among older children, particularly boys. Overall work participation, including household work (chores), farm activities, and market activities, among boys aged 12–17 years significantly decreased by 4 percentage points from a pre-Program level of 55%. This reduction in work participation correlates with the increase in school participation, providing positive evidence of the substitution of school for work in this setting. The *Progresa* Program reduced 8–17-year-old girls' labor force participation by 1.3 percentage points from a pre-treatment level of 8.6% and reduced boys' labor force participation by 3.1 percentage points from a pre-treatment level of 22.4%. The largest reduction in girls' labor activities was in the extent of their domestic work, which was about a 10% reduction in participation, although there was no a significant reduction in the number of hours spent doing domestic work. Similarly, an evaluation of the *Progresa* Program conducted by Sadoulet et al. (2004)<sup>14</sup> found that, for children aged 12–14 years, participation in *Progresa* reduced the probability that boys worked by 7 percentage points on average, which represents a 23% decrease. For girls, the reduction was 6 percentage points, on average, which represented a 50% decrease.

Skoufias and Parker (2001) presented interesting findings about girls' schooling: The increase in school attendance due to participation in the *Progresa* program was much larger for girls than boys, which is similar to the findings of other studies (e.g., Sadoulet et al., 2004). For 8–17-year-olds, the average effect of participation in the *Progresa* Program on school attendance for girls was almost twice that of boys (a 4 percentage point increase for girls versus a 2.2 percentage point increase for boys). For the girls aged 12–17, the *Progresa* Program increased school attendance by 7 percentage points (about a 14% increase), up from the pre-program level of 51%.

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<sup>14</sup> Sadoulet et al. (2004) pointed out that their coefficients are consistent with the findings of Skoufias and Parker (2001), although they are slightly larger. The reasons for the difference are that Sadoulet et al.'s (2004) analysis controlled for child fixed-effects, estimated *Progresa*'s impact in each round instead of for each year, and estimated the impact on the round in 2000 after the control group was incorporated.

### **3.9. Policies: subsidies to child care**

Many countries around the world, including those in Latin America, have increased the provision of subsidized child care. The evidence regarding the effects of these programs on labor supply is usually positive but heterogeneous. Child care facilities can be provided through child care subsidies, as in Sweden (Lundin, Mörk, and Öckert, 2008) and Norway (Havnes and Mogstad, 2011); by building new child care centers, such as in Argentina (Berlinski and Galiani, 2007) and Chile (Medrano, 2009); or by providing after-school care, as in Switzerland (Felfe, Lecher, and Thielman, 2013).

Subsidized child care services have positive effects on labor supply, but these results are difficult to generalize. Akgunduz and Plantenga (2011) argued that the elasticity of child care prices has an inverted U-shape that depends on the initial characteristics of each country. They theorized that a reduction in child care costs might not have significant effects in countries with low female labor force participation or in countries already having high female labor force participation rates. Countries having high rates of female labor force participation before implementation of a child care program do not have much room for improvement. Lundin et al. (2008) found that, in Sweden, a considerable reduction in public child care prices did not translate into an increase in female paid labor, mainly because Sweden has been a frontrunner in providing public child care since the 1960s and has consistently had high levels of mothers' labor supply. However, countries with low labor force participation may have some characteristics that prevent significant changes related to these policies. These countries tend to have traditional norms and/or rigid institutions that would prevent a large effect of the program. Del Boca and Vuri (2006) emphasized that, in Italy, the presence of a high-quality child care system did not translate into a higher probability of employment. They argued that Italy's rigid labor market, with most of its employment being full-time, is incompatible with a child care system that offers partial coverage during the day.

Child care programs should have a greater effect in countries with relatively low labor force participation and with labor markets that are somewhat flexible. Subsidies for child care can free up mothers to enter the labor market. The provision of less expensive child care has been found to positively influence female labor force participation in Canada (Lefebvre, Merrigan, and Verstraete 2009), France (Goux and Maurin, 2010), Argentina (Berlinski and Galiani, 2007; Berlinski, Galiani, and McEwan, 2011), and Germany (Bauernschuster and Schilotter, 2013). Child care policies also are associated with long-term effects in countries such as Canada (Lefebvre et al., 2009) and Spain (Nollemberg and Rodrigues-Planas, 2011). The reduction of time spent outside the labor force leads to better opportunities to find a job and better long-term prospects for the mother.

Scholars believe that the main driver of these positive results is the behavior of some subgroups of women, particularly women with children, who, in the absence of the program, would face a much higher cost of child care. Cascio (2006) found a positive effect of public schooling on maternal labor supply among single mothers with young children but not on married mothers. In general, studies on countries such as Canada (Lefebvre et al., 2009) and France (Goux and Maurin, 2010) have found that the particular targets of child care subsidies are the vulnerable population groups of single mothers and relatively less-educated mothers.

### **3.10. Preferences: culture and religion**

A society's prevailing values and its ideas about women's roles are influenced by culture (and sometimes, by religion). These factors can shape women's preferences and aspirations, thereby influencing their decisions regarding labor force participation.

*Culture.* Culture can be defined as a set of preferences and beliefs. Economists have worked to rationalize the ways that culture and gender roles influence women's labor force participation. The economics of identity aim to study culture and preferences in an economic theory framework, specifically the ways that identity, or a person's sense of self, influences economic outcomes. For example, Akerlof and Kranton (2000) argued that women tend to dominate jobs that match female gender characteristics, and they avoid male professions because of male gender associations. Similarly, men tend to avoid so-called women's professions. These scholars proposed that the US women's movement of the 1960s and 1970s included goals to deconstruct societal notions of femininity and disengage gender from tasks, both in the home and the workplace. The social changes resulting from that movement lessened women's gains in identity from homemaking and lessened their identity loss from working at a so-called man's job, both of which increased female labor force participation and decreased occupational gender segregation. In this identity theory of gender in the workplace, decreased occupational gender segregation between 1970 and 1990 in the US can be interpreted as primarily having been caused by the widespread changes in social norms related to gender.

Social attitudes toward working women influence married women's labor force participation. Fernandez (2013) studied the function of cultural changes generating the sharp increase in married women's labor force participation in the US during the twentieth century. She modeled the changes in culture as emerging from a learning process, in which married women compared the benefits of increased consumption from labor earnings with the anticipated utility cost of working. Her model generated a time-based trend of married women's labor force participation that correlates with the historical path observed in the US over the past 120 years.

Studying the descendants of immigrants helps isolate the effects of other factors while examining culture's particular role in decisions about participation in the labor market. For example, second-generation Americans share economic and institutional characteristics with their fellow Americans; however, they do not necessarily share the mainstream culture because they likely are influenced by their parents' cultural preferences and beliefs from the country of origin. Fernández and Fogli (2009) exploited this idea by exploring culture's role in determining the work outcomes of second-generation American women. The authors employed the 1970 US census and used the female labor force participation rates for 1950 and the total fertility rates of the parents' countries as proxy measures of cultural preferences and beliefs about women's roles. The results indicated that women whose parents were born in countries where women participated relatively more in the workforce tended to work relatively more. A one standard deviation increase in labor force participation in 1950 was associated with about a 7.5% increase in the women's numbers of hours worked per week in 1970.

A married woman's decision to work may be influenced by her husband's preferences and beliefs about gender roles. Fernández et al. (2004) found that the probability that a man's wife was in the labor force was correlated with whether his mother had worked, controlling for background characteristics. They further found that the probability that a married woman was in the labor force full-time was about 24–32 percentage points higher when her husband's mother had worked for at least one year when he was a child. In addition, they found an intergenerational channel such that a one-week increase in the average female labor supply led to an increase of 1.67 weeks worked by females in the next generation. Similarly, Del Boca et al. (2000) found that when the husband became unemployed, the wife's employment response was mediated by her attitudes toward work, which were proxied by whether the wife's mother had worked or her mother-in-law had worked at her age. From this perspective, cultural norms present an obstacle to overcoming poverty. If the cultural beliefs that women should not work outside the home are strong and the household is poor, their effects are likely to make it difficult for the household to overcome poverty. Notwithstanding the type of economic shock that may hit a poor household, the wife would remain unlikely to enter the labor force.

*Religion.* Religion carries its own set of preferences and beliefs that potentially influence women's decisions about participation in the labor force. Religion is of particular interest in Latin America because it is a traditionally Catholic region where the church has an important and strong influence on daily life. Considering the 15 countries in our sample, on average, about 72% of the population of each country is reportedly Catholic. Guiso et al. (2003) analyzed data from 66 countries and found that religious people tended to have less favorable attitudes toward working women. In Latin America, there is a slightly negative relationship between labor force participation and the size of the practicing Catholic

proportion of the population. Indeed, the highest rate of female labor force participation exists in the country with the lowest proportion of practicing Catholics.

Studies have found that Protestants tend to work more hours, on average, than people of other religions. Pastore and Tenaglia (2013) used data from European countries and found that active Catholic women tended to work fewer hours than average, and non-active Protestant women tend to work more hours than average. They further found a strong negative association between the proportion of individuals belonging to the Catholic Church and the proportion of women participating in the labor force.

Feldmann (2007) examined data from 80 countries to investigate whether the Protestant religion influenced labor market outcomes and found that the countries in which the majority of the population practiced Protestantism had significantly higher labor force participation rates, particularly among women. Compared to countries dominated by other religions, labor participation rates in Protestant-dominated countries were between 11 and 12.8 percentage points higher, adjusting for other factors that influence labor market outcomes, such as labor laws, GDP growth, and so on. The Protestant virtue of hard and diligent work seems to have become part of the national culture where Protestantism dominates (Feldman, 2007).

Ultimately, the decision to participate in the labor market is influenced by both culture and religion, among other factors in the social environment. It is challenging to disentangle the effects of one from the others because they are deeply interrelated in people's lives. The dominant religion of a country, particularly religions with historical traditions, shapes the national culture and influences even the people who practice minority religions. Religious values are transmitted from generation to generation, although not always as much from deep convictions as from force of habit (Guiso et al., 2003).

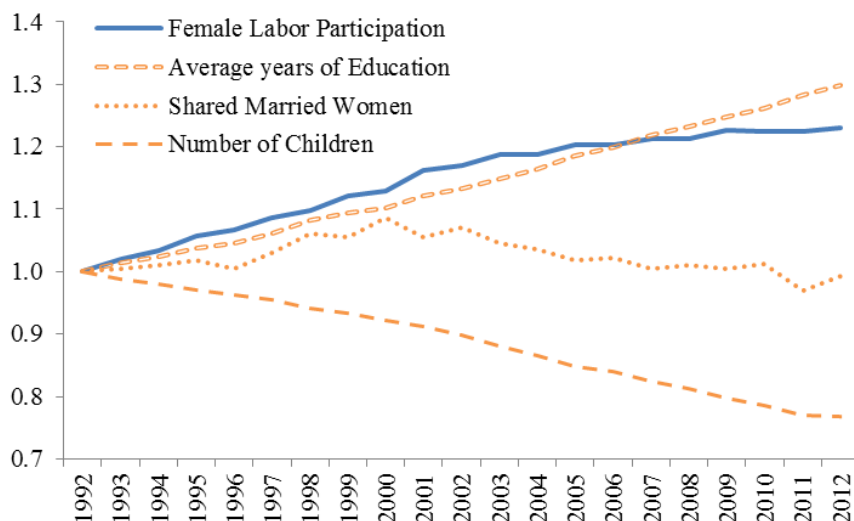
#### **4. An assessment of the relative importance of the determinants**

To assess the relative merits of the various explanations for female labor force participation, two independent strategies were undertaken. First, portions of the literature were summarized and analyzed with measures of changes in some determinants of the labor supply. Second, household data were analyzed with policy variables to reveal correlates between the determinants of these explanatory variables.

#### 4.1. Effect Sizes in the Literature

A literature search was conducted between September 2014 and March 2015. To avoid publication bias, published and unpublished papers were searched in several databases<sup>15</sup> using a predefined set of keywords.<sup>16</sup> The criteria that determined study inclusion were as follows: (1) Papers that provided estimations of causal effects of a given determinant on the extensive or intensive margins of labor supply were included, and (2) the chosen studies were required to provide sufficient information to compute effect sizes. Studies were excluded when (1) they were unrelated to labor force participation and instead examined employment or unemployment status outcomes, (2) they were theoretical papers, (3) the estimation methods employed therein did not distinguish among the effects of the covariates on the outcome, (4) they were book reviews, policy recommendation reports, or strictly descriptive analyses, and (5) they were nonquantitative research reports. These restrictions meant that some topics were excluded from the analysis (such as education, discrimination, and preferences), and some of the papers discussed in the previous section were excluded.<sup>17</sup>

Figure 6: Labor supply and joint decisions variables Latin America



Source: own calculations based on microdata from national household surveys. All index series are normalized in terms of the first year (1992)

<sup>15</sup> These included Econlit, JStor, Repec, SSRN, NBER, AEA, Google Scholar, the Inter-American Development Bank working papers series, and the World Bank databases.

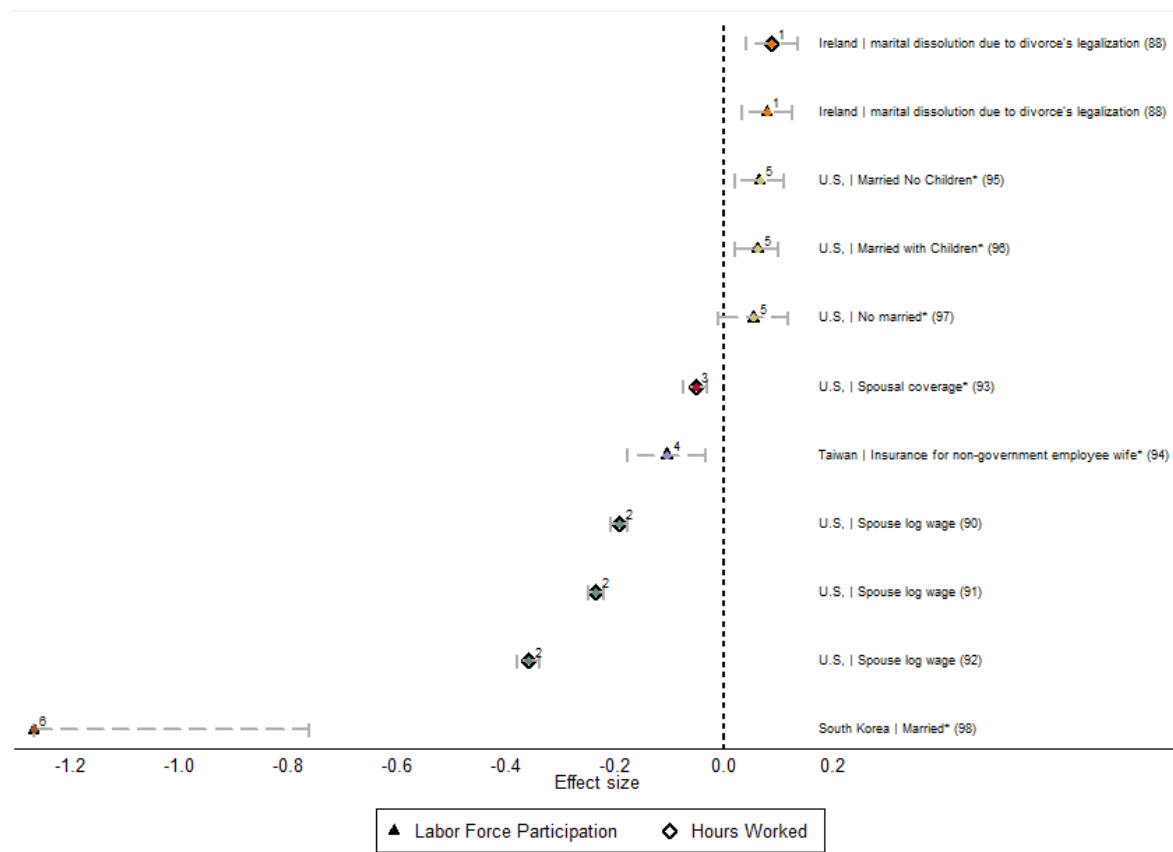
<sup>16</sup> The keywords included “female” (“labor supply,” “labor force participation,” or “hours worked”) and a set of words (listed in Figure 1) related to the determinants of labor supply.

<sup>17</sup> These include, for example, Agüero and Marks (2011), Berlinski and Galiani (2007), Cristia (2008), Cruces and Galiani (2007), Del Boca (2015), Dinkelman (2011), Galiani and McEwan (2013), Grogan and Sadanand (2012), Klonner and Nolen (2010), and Lehman (2014).

Figure 6 shows the evolution between 1992 and 2012 of the average female labor force participation in Latin America, educational attainment (years of education), marriage rates (the proportion of women living with a spouse or partner in the total population), and fertility (total number of children). All the series are normalized to one in 1992. Education increased in tandem with labor force participation, marriage generally remained constant, and fertility declined. Tables 6.2a and 6.2b in the Appendix provides a set of disaggregated statistics on these possible determinants of labor force participation.

The analysis did not estimate causal effects of educational attainment on labor supply. However, it should be noted that, in Latin America, countries have continually and substantially expanded access to basic education since the beginning of the twentieth century. A large part of that expansion has been driven by policies related to education per se and not the female labor supply (Bassi, Busso, and Muñoz, 2015). Accordingly, it is likely that improved access to education is one of the drivers of higher rates of female labor force participation.

Figure 7: Effect sizes of marriage on female labor supply



\* Semi-elasticity, \*\* Because of scale the lower IC of paper number 98 is not shown. Source: own calculations based literature analysis.

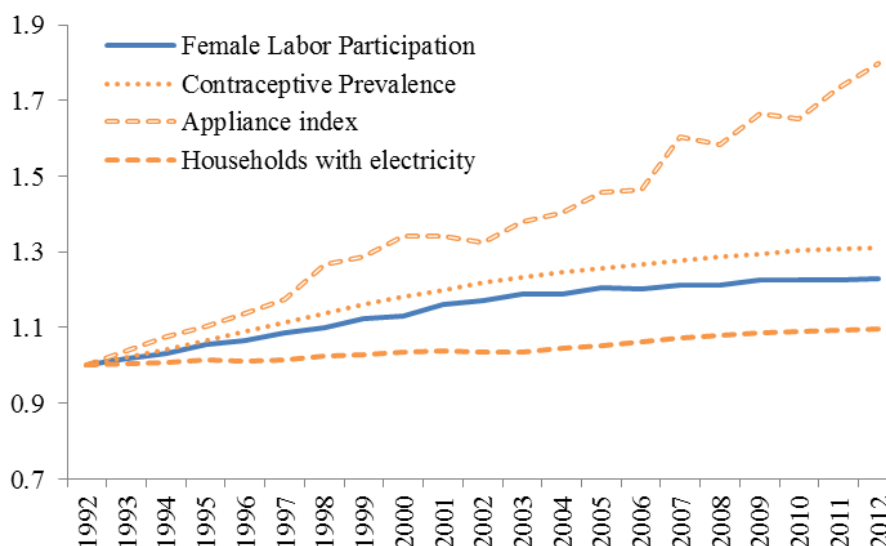
Figure 7 presents the effect sizes of the marriage-related variables on labor supply. Each data point (the diamond shapes within the figure) shows an effect size; that is, it illustrates



the percentage change in labor supply divided by the percentage change in the dependent variable. Figure 7 shows a 95% confidence interval for each effect size. The legend on the right-hand side of the graph in Figure 7 provides information about the country in which the study was conducted, the identity of the independent or dependent variable that underwent a change, and a number within parentheses associated with Table 3 in the Appendix, indicating details of additional studies as references.

Spousal wages and healthcare coverage were negatively related to labor outcomes, and increase in the risk of divorce was associated with an increase in female labor force participation. Those results are consistent with the analyses of the mechanisms described in Section 3, where we noted that the research literature tends to find small or weak effects of changes in marriage rates on female labor supply and positive associations of divorce on female labor force participation. These facts, together with the observation that marriage rates have changed little in the region, suggest that marriage-related variables cannot completely explain the long-term observed trends in female labor supply in Latin America.

Figure 8: Labor supply and technology variables Latin America



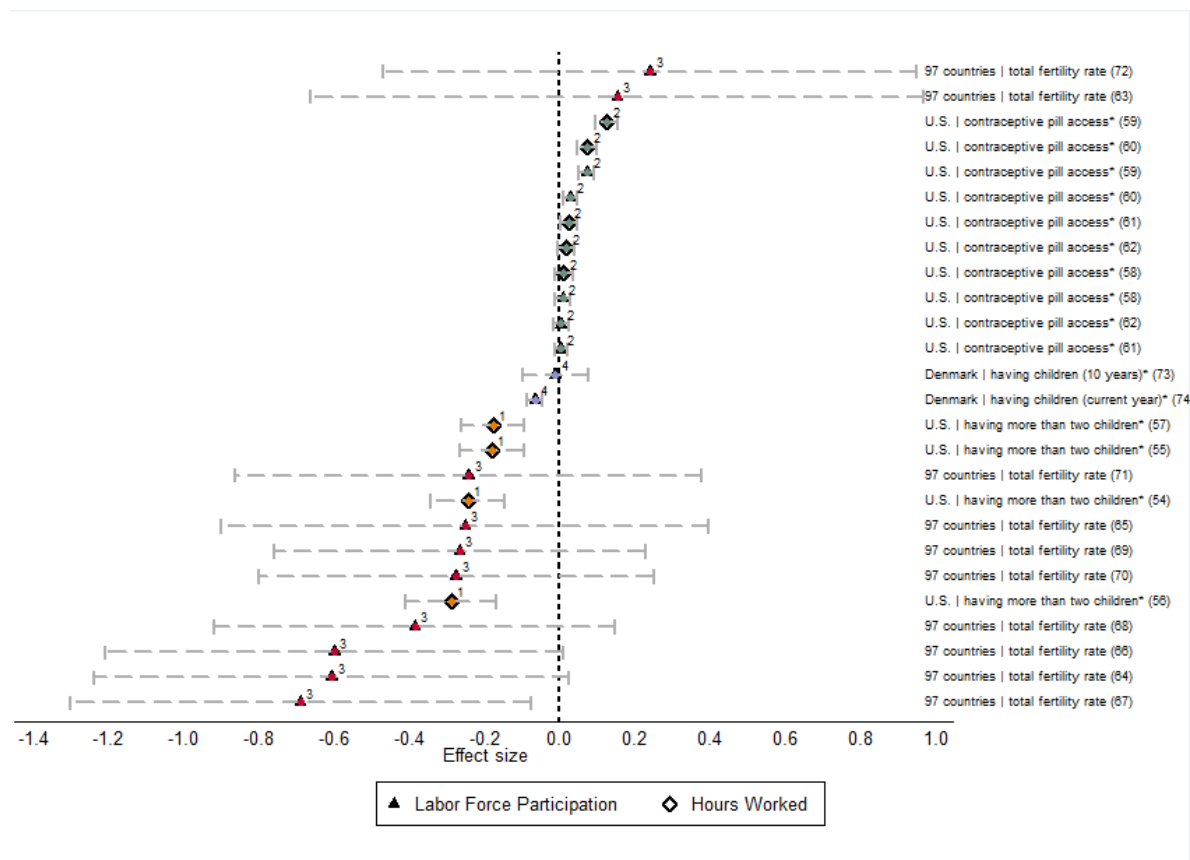
Source: own calculations based on microdata from national household surveys. All index series are normalized in terms of the first year (1992)

Figure 8 presents the evolution of female labor force participation with three selected technology variables: prevalence of contraception (health technology), use of appliances in the home (home technology), and availability of electricity (home technologies). Access to health and home technologies has increased in Latin America. The reasons previous studies found a negative effect of childbearing and a positive effect of delaying childbearing on the female labor supply were discussed in the literature review (see Section 3.4). It was concluded that the studies found significant effects of health technologies on the labor

supply. In particular, access to and use of contraceptive methods (i.e., the pill) has likely had a positive effect; access to technologies that save time during a child's infancy (i.e., formula) has also likely had a positive effect on the labor supply. Access to abortion, however, is an unlikely explanation in the Latin American context because it is illegal in most Latin American countries.

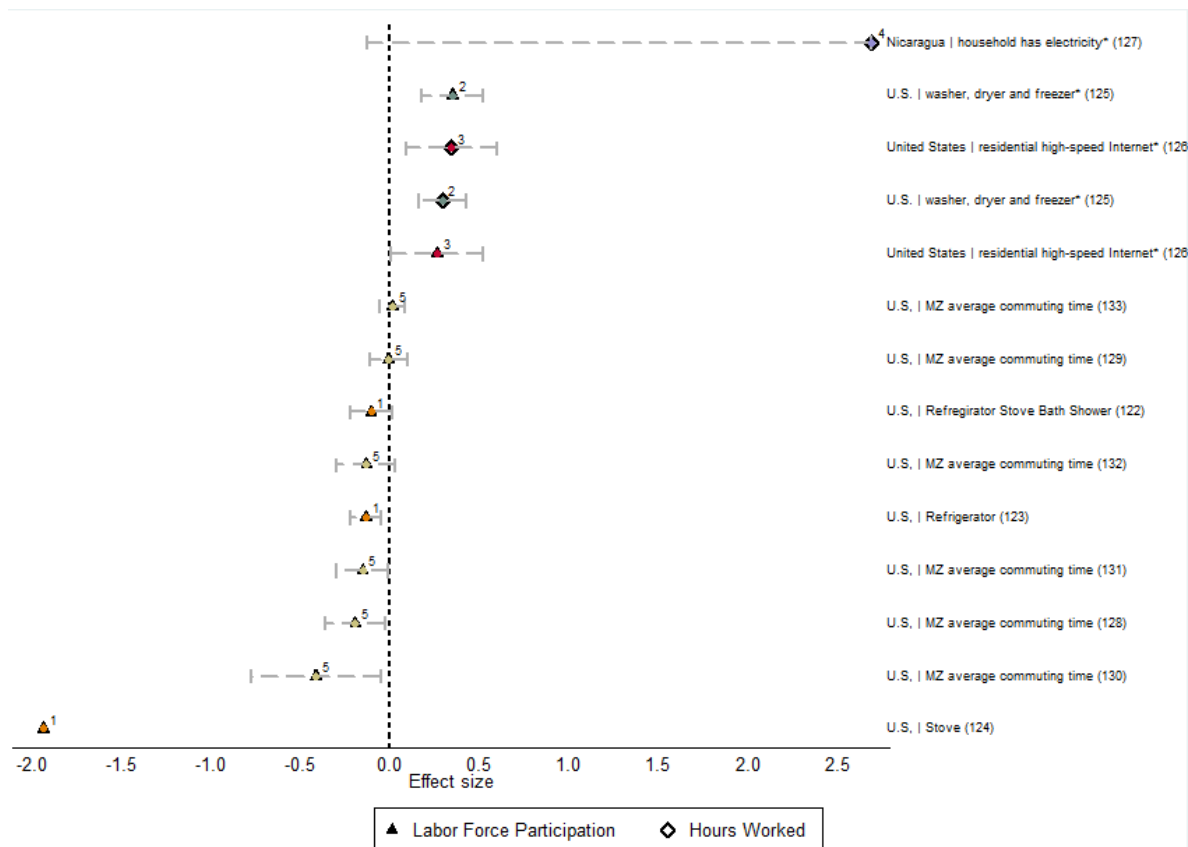
Figure 9 presents the effect sizes of changes in fertility and health technology variables on the female labor supply. The figure illustrates that, generally, there apparently is a negative relationship between the total fertility rate and the female labor supply with, sometimes, very large effect sizes. Additionally, access to health technology apparently has a positive effect on labor outcomes. These findings, together with the observations that fertility rates have declined and access to health technology has increased in Latin America, suggest that these two causal variables might explain an important part of the increase in labor supply.

Figure 9: Effect sizes of fertility and health technologies



\* Semi-elasticity. Source: own calculations based literature analysis.

Figure 10: Effect sizes of home and work technology

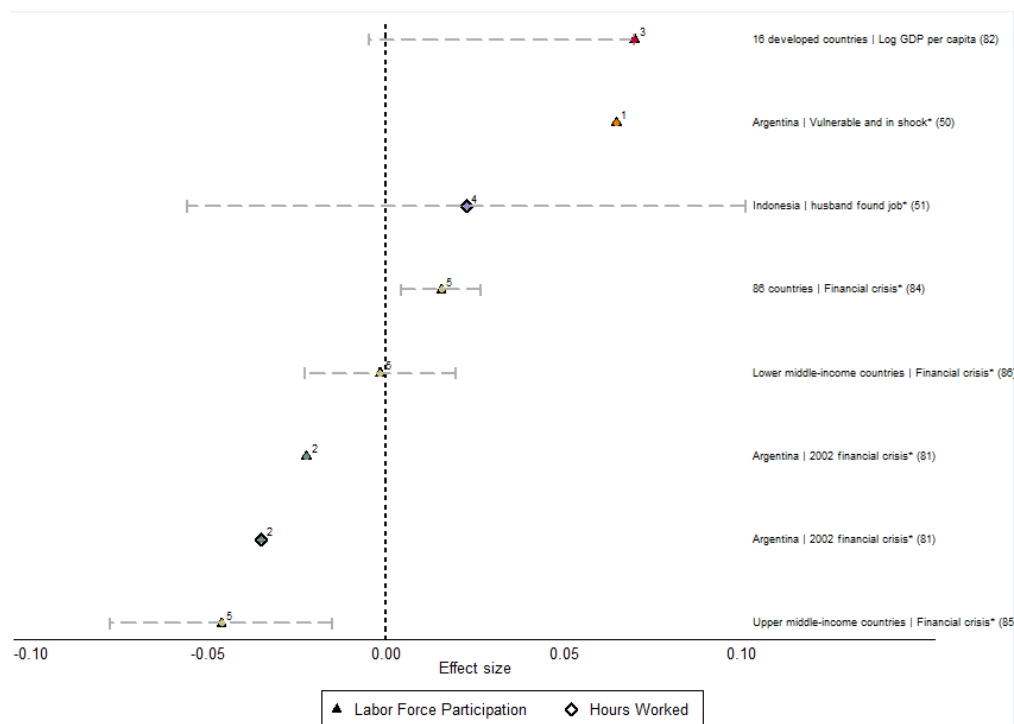


\* Semi-elasticity, \*\* Because of scale the upper IC of paper number 127 is not shown. Source: own calculations based literature analysis.

Figure 10 presents the effect sizes of changes in home and work technology variables on the female labor supply. Generally, the effects are small and vary in direction. As pointed out by Goldin (2014), work technologies that allow for flexible working hours have not yet changed significantly in developed countries, and it is very likely that they have not changed in Latin America. Thus, we give little credibility to that explanation. However, the use of home technologies has dramatically changed. Even so, the effect sizes appear to be on the lower side of the distribution. Therefore, these factors probably do not explain much of the increase in the female labor supply since 1990. Some studies have found positive changes in women's labor activities after increased access to specific time-saving home appliances (washer, dryer, and freezer). Access to public services, such as electricity and in-home high-speed Internet, has been associated with increases in women's labor force participation. Similarly, Black, Kolesnikova, and Taylor (2007) found a negative relationship between commuting time in US metropolitan areas and women's labor force participation. Despite the small effect sizes, it is reasonable that access to home technologies might explain some portion of the increases in female labor force participation before the 1990s, when most of the innovations and expansions in electricity occurred in Latin America. It might also explain why the labor supply gap between poorer and richer

households shrunk since the former are usually the last to incorporate technological advancements in their households.

Figure 11: Effect size of changes in labor returns (macroeconomic conditions)



\* Semi-

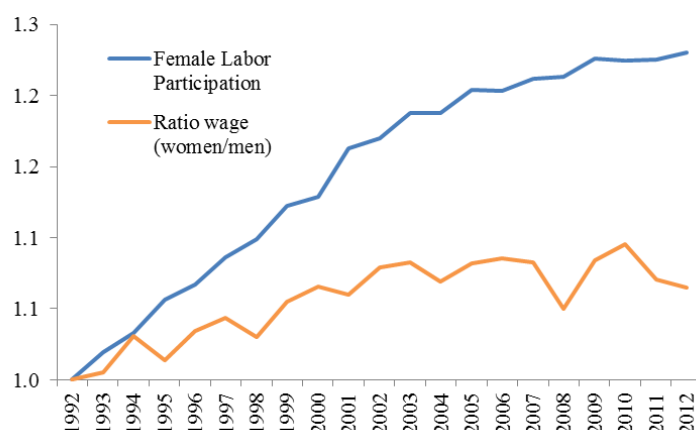
elasticity, \*\* Because of scale the upper IC of paper number 82 is not shown. Source: own calculations based literature analysis.

Figure 11 shows the effect sizes of changes in macroeconomic conditions on the labor supply. The effects are generally small, and as the literature review revealed, macroeconomic conditions vary in the short term and are more likely explanations of cyclical changes than of long-term trends in the female labor supply. However, macroeconomic variables are positively related with female labor force outcomes. Olivetty (2013) found a positive relationship between GDP and labor force participation. Being in a financial crisis was associated with a decrease in women's labor force participation, and in developed countries, recovery from macroeconomic shocks was associated with an increase of female work hours.

Figure 12 describes the evolution of the female labor supply compared to the ratio of female to male wages (a crude measure of labor market discrimination). During the past 20 years, this type of discrimination has decreased, although the decline has stagnated recently. There are no studies estimating the extent to which a decrease in the wage gap influences the female labor supply. As the literature review suggested, the effects of discrimination on the female labor supply operate via a number of channels. The most obvious one is that discrimination changes the comparative advantage of men and women

to work outside the home. Therefore, it is expected that changes in discrimination would increase female labor force participation.

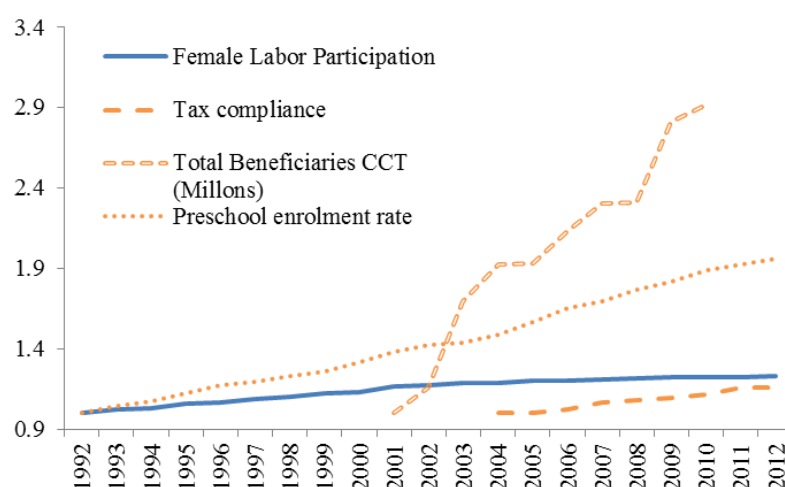
Figure 12: Labor supply and labor returns (discrimination) Latin America



Source: own calculations based on microdata from national household surveys. All index series are normalized in terms of the first year (1992)

Figure 13 describes the evolution of the female labor supply in contrast to a set of policy variables. Preschool enrollment has dramatically increased in the region. In addition, the number of CCT beneficiaries has tripled since the early 2000s, and tax compliance has increased in the past decade.

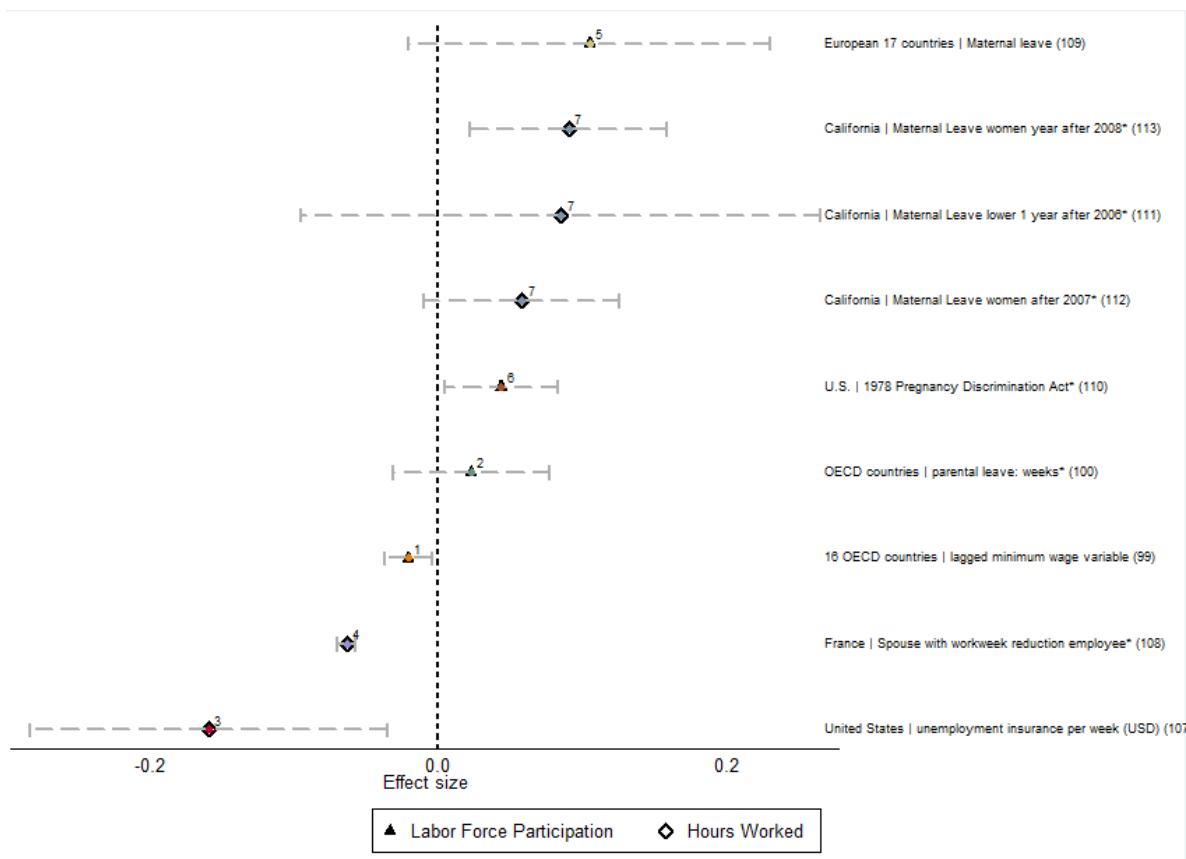
Figure 13: Labor supply and policy variables. Latin America



Source: own calculations based on microdata from national household surveys. All index series are normalized in terms of the first year. 1992 for Female Labor Participation and preschool enrolment rate, 2001 for CCT beneficiaries and 2004 for tax compliance.

Figure 14 shows the effect sizes of changes in labor laws on the female labor supply. The results of empirical studies suggest that the effects of labor laws are mixed, with some finding that maternal leave is associated with an increase in women's labor force participation, and others finding that other policies, such as unemployment insurance or minimum wage, are negatively associated with women's labor force participation (see Section 3.7). Regardless, the effects appear to be small.

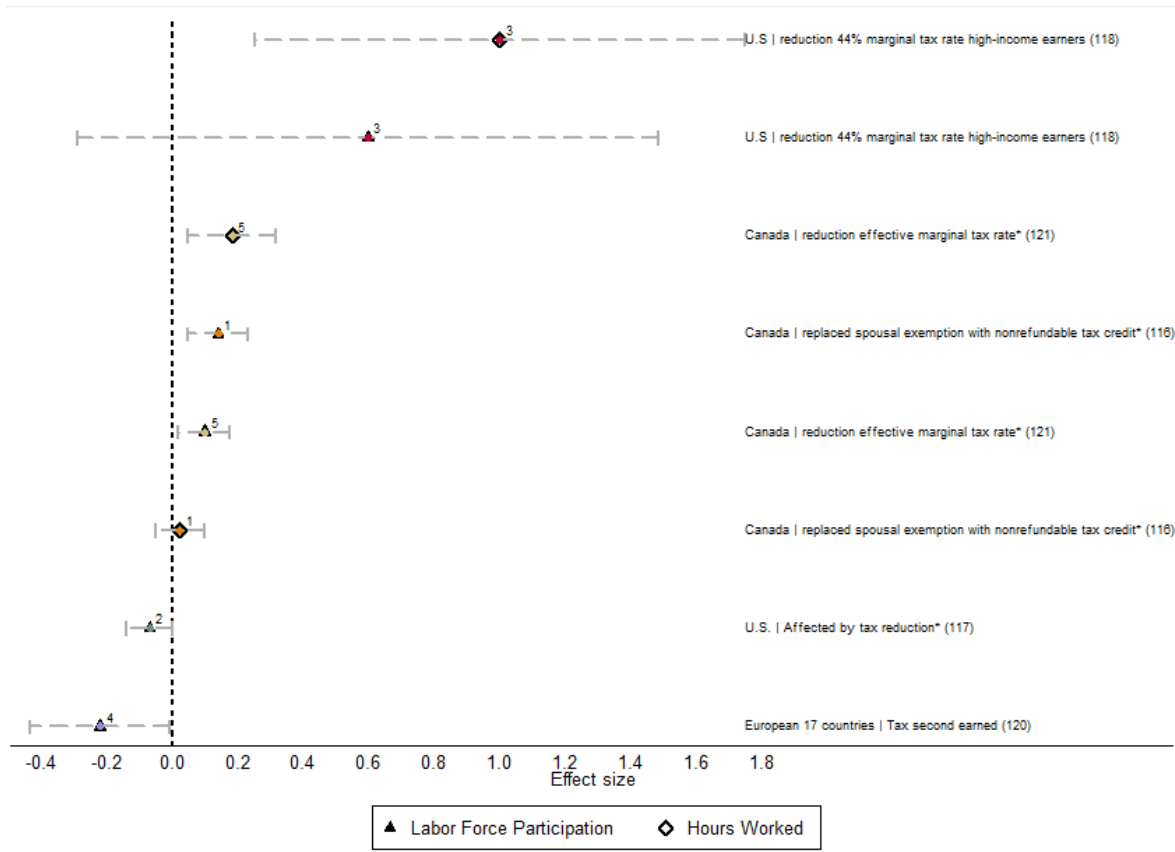
Figure 14: Effect size of labor regulations on female labor supply



\* Semi-elasticity. Source: own calculations based literature analysis.

Figure 15 shows the effect sizes of changes in taxation on the female labor supply. There is a positive relationship between tax reduction and female labor supply across a wide range of studies. Countries where these changes have been implemented (e.g., the US and Canada) have experienced an increase in female labor force participation (see Section 3.7).

Figure 15: Effect size of taxes on female labor supply



\* Semi-elasticity. Source: own calculations based literature analysis.

As Figure 13 illustrates, CCTs have become very popular in Latin America. Figure 16 summarizes the effect sizes of CCTs on the female labor supply. The analysis of the literature on the effects of the programs showed that the actual effect of CCTs on labor force participation must be empirically tested. In the US, the potential disincentives were the main reasons for the so-called welfare reform (Fiszbein et al., 2009). In Latin America, one set of impact evaluations of CCTs on the female labor supply mostly found small and insignificant effects. Regarding Mexico's *Progresa* Program, there were no statistically significant effects on women's labor force participation and hours worked (Alzúa et al., 2012; Parker and Skoufias, 2000; Skoufias and di Maro, 2006). Nicaragua's CCT program, *Red de Protección Social*, also had no effect on female labor force participation or number of hours worked (Maluccio and Flores, 2005). Another set of more recent evaluations found small negative effects. In Honduras, Novella et al. (2012) found a very small decrease in maternal labor participation (about 3 percentage points). Fernandez and Saldarriaga (2014) found a negative effect on female labor force participation in Peru. Similarly, three studies on Nicaragua found negative impacts of CCTs on the number of hours worked. A similar negative effect was found in Uruguay. Gasparini et al. (2015) found that an income transfer program in Argentina created a small disincentive to female labor force participation.

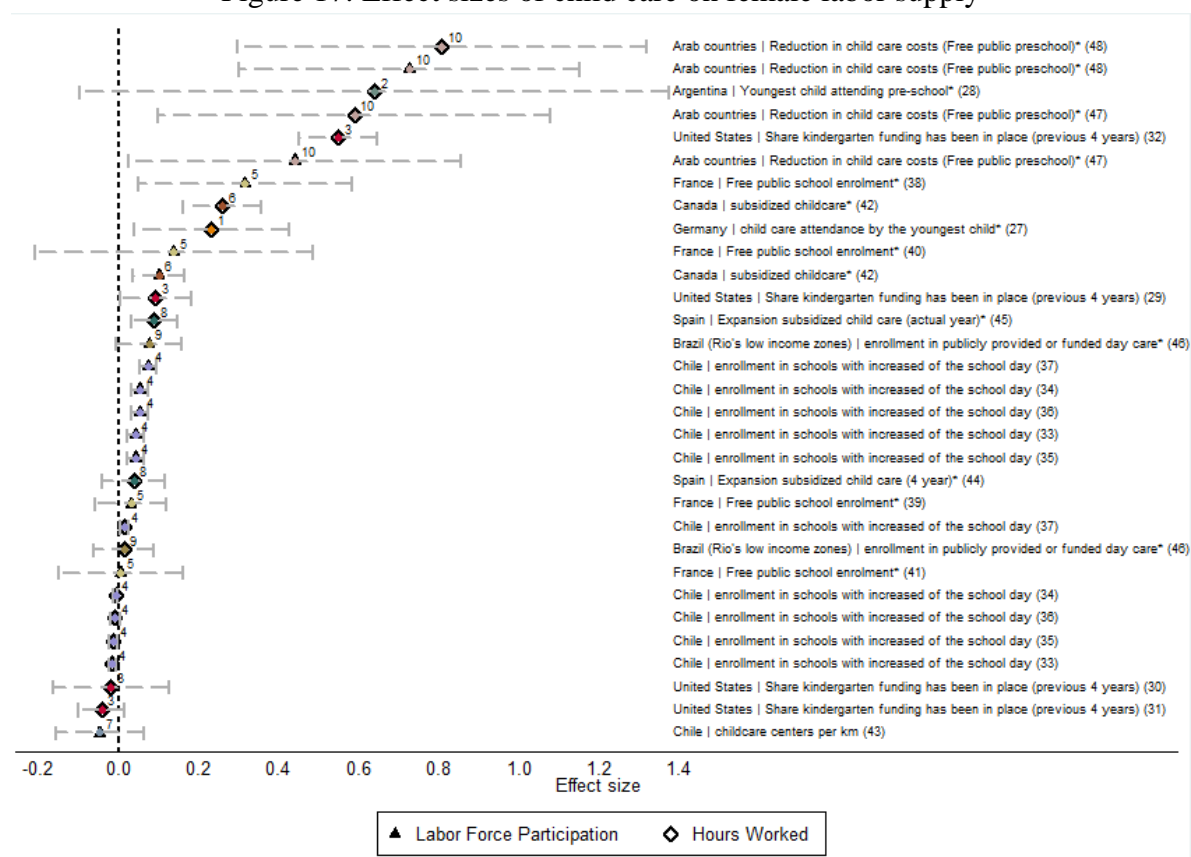




reacted positively. CCT programs typically start in rural areas and later expand into urban areas; with time, the negative effect on labor supply should dominate. In sum, it is likely that the expansion of CCTs in the region did not cause a decrease in labor force participation when the programs were launched; however, the expansion seems to have halted the positive trend in female labor force participation in Latin America.

On the other hand, preschool expansion is likely to have increased women's participation in the labor force. Figure 17 summarizes the effect sizes of access to child care on the female labor supply.

Figure 17: Effect sizes of child care on female labor supply



\* Semi-elasticity. Source: own calculations based literature analysis.

The empirical studies tend to find a positive and relatively large effect on labor force participation or the number of weekly hours worked.<sup>18</sup> Considering these results together with the expansion of child care provision in Latin America, it is reasonable to conclude that the expansion of these services has likely encouraged women to enter the labor force.

<sup>18</sup> However, there are some exceptions. Contreras et al. (2010) found that extending the length of the school day reduced the number of hours worked by women in Chile. Using data for the US, Cascio (2006) found that public preschools for 5–6-year-old children did not affect the labor supply mothers with eligible children. The only effect is on more vulnerable populations.

## 4.2. Correlates of female labor supply

Examining correlations in the data is an alternative method for studying the relative importance of the determinants of female labor supply. To do so, a panel dataset of 15 countries was built for the period 1990–2010 and correlations were estimated using Ordinary Least Squares in the following model:

$$\Delta Y_{ct} = \theta \Delta Z_{ct} + \beta X_{ct} + \eta_c + \varepsilon_{ct}$$

where  $\Delta Y_{ct}$  is the annual change in the outcome  $Y_{ct}$  of country  $c$  in year  $t$ ,  $\Delta Z_{ct}$  is the change in a plausible determinant of the female labor supply,  $X_{ct}$  is a vector that includes indicator variables for extrapolation and methodological changes in the surveys, and  $\varepsilon_{ct}$  is the error term. Two outcomes of  $Y_{ct}$  were examined: female labor force participation and average total numbers of hours worked by women. In addition, these measures were disaggregated by different characteristics (income, education, children in the household, and household structure).

The vector  $Z_{ct}$  includes: (1) the log of the average number of years of education, (2) the proportion of married women (or women living with a partner) aged between 18 and 55 years, (3) the log of the women's average number of children, (4) the log of fulltime wages, (5) the ratio of female to male wages, (6) the average age of children in the household, (7) the percentage of women responsible for an elderly person, (8) an index of children attending school,<sup>19</sup> (9) an index of appliances in the household,<sup>20</sup> (10) the percentage of married women that use contraception, (11) the percentage of non-practicing Catholics in the country, (12) GDP growth, and (13) an indicator variable of the presence of any CCT program in the country. Table 4 of the Appendix provides full details about the loading factors of the variables that were built using factor models. The standard errors were clustered at the country level. Table 5 shows the results.

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<sup>19</sup> This index is based on a factor model that included the percentage of households with children enrolled at school, the net enrollment rates at preprimary and primary schools, and the gross enrollment rate at secondary schools. Table 6.4 of the Appendix provides details on the estimations and properties of these indices.

<sup>20</sup> This index was created using a factor model that includes the percentage of households with various appliances (e.g., washing machine, car, motorcycle, and electricity).

Table 5: Correlates of the change in female labor force participation  
Panel dataset: 15 Latin American countries, 1990 -2010. Women aged 18-55

Covariates	Labor Force Participation	LFP by Income		LFP by Women Education			LFP by Women with children			LFP by Household structure		
		Quintil 1	Quintil 5	Less than complete secondary	Secondary complete	Tertiary Complete	At least 1 child age 0	At least 1 child age CSA to CFA	No children or children older than CFA	Nuclear Household	Single headed Household	Total Worked Hours
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
<b>Education</b>												
Ln (Years of Education)	12.597* (7.127)	-7.149 (12.890)	21.333* (11.826)	--	--	--	16.104* (9.273)	8.554 (7.285)	5.978 (7.853)	8.994 (7.547)	15.865** (7.775)	-1.886 (8.769)
<b>Marriage &amp; Fertility</b>												
Shared married women 18-55	-0.011 (0.015)	0.010 (0.035)	-0.038 (0.028)	0.006 (0.018)	-0.017 (0.020)	0.024 (0.025)	-0.041* (0.024)	-0.012 (0.020)	0.008 (0.020)	-0.018 (0.017)	0.024 (0.016)	0.035 (0.038)
Ln (Number of children)	-20.599*** (6.523)	25.513* (14.703)	-37.742*** (9.751)	-9.834 (8.445)	-13.370 (8.551)	-6.938 (7.951)	-21.159** (9.662)	-16.530** (8.098)	-21.637*** (7.364)	-15.178** (7.507)	-21.512*** (7.104)	7.046 (9.693)
<b>Labor Market Returns</b>												
Ln (Wages full time)	1.568 (1.875)	-2.381 (3.618)	7.299*** (2.596)	-0.617 (2.369)	0.661 (2.330)	3.021 (2.813)	1.453 (2.755)	0.473 (2.441)	2.320 (1.899)	1.315 (2.194)	1.306 (1.663)	-2.942 (2.431)
Ratio wage women/men	2.608 (2.942)	5.983 (4.258)	4.722 (4.034)	2.264 (3.336)	-0.218 (3.678)	4.494 (3.900)	6.558* (3.498)	3.780 (3.276)	3.493 (3.254)	2.649 (2.887)	1.209 (3.050)	-2.833 (2.839)
<b>Home Returns</b>												
Children in the school (Factor)	1.149 (0.785)	2.441 (1.573)	1.374 (1.050)	1.436 (0.938)	0.765 (0.977)	0.402 (1.168)	1.884* (1.074)	1.597* (0.935)	1.122 (0.909)	1.322 (0.837)	0.041 (0.860)	0.242 (1.147)
% women in charge of old person	-0.272 (0.194)	-0.217 (0.326)	-0.332 (0.278)	-0.388* (0.231)	-0.267 (0.207)	-0.226 (0.257)	-0.279 (0.261)	-0.393** (0.187)	-0.488** (0.190)	-0.228 (0.209)	-0.418** (0.193)	-0.076 (0.300)
Average age children at households	2.502* (1.369)	-3.364 (2.583)	4.798** (2.068)	1.316 (1.687)	4.324** (1.703)	0.526 (1.438)	2.303 (1.651)	1.953 (1.387)	2.522* (1.488)	1.457 (1.495)	2.416** (1.172)	-0.615 (1.444)
<b>Household Technology</b>												
Appliances in the household (Factor)	1.294* (0.751)	-0.969 (1.175)	2.873 (1.869)	0.378 (0.736)	0.909 (0.999)	0.938 (1.396)	1.703 (1.115)	0.922 (0.815)	0.641 (0.932)	1.220* (0.720)	0.293 (1.144)	1.546 (0.965)
<b>Health Technologies</b>												
% women married/union using modern contraceptive methods	0.382** (0.162)	1.007** (0.402)	-0.073 (0.310)	0.488** (0.201)	0.320 (0.231)	0.086 (0.246)	0.369 (0.246)	0.618*** (0.195)	0.508*** (0.186)	0.474** (0.186)	0.064 (0.215)	0.283 (0.186)
<b>Culture</b>												
Percent non-practising catholic	0.029 (0.028)	0.066 (0.054)	0.012 (0.043)	0.035 (0.033)	0.062** (0.029)	-0.004 (0.028)	0.036 (0.038)	0.028 (0.031)	0.044 (0.032)	0.024 (0.030)	0.047 (0.029)	-0.001 (0.037)
<b>Macro</b>												
GDP growth (annual %)	-0.033* (0.019)	-0.128*** (0.044)	0.022 (0.039)	-0.043* (0.024)	-0.012 (0.022)	-0.034 (0.023)	-0.064** (0.027)	-0.024 (0.024)	-0.021 (0.022)	-0.044** (0.021)	0.008 (0.026)	0.007 (0.022)
<b>Policy</b>												
=1 with CCT program	-0.609 (0.553)	0.094 (0.967)	-0.420 (0.819)	-0.353 (0.665)	-0.834 (0.557)	-0.223 (0.568)	-0.726 (0.836)	-0.571 (0.763)	-0.494 (0.546)	-0.496 (0.592)	-0.864 (0.642)	-1.562 (1.429)

Notes: Each entry shows an estimate of the regression coefficient of a model of the annual change in female labor participation on each individual covariate. The table presents three main female participation measures: Rate of women's labor participation, average total worked hours by women and percent women in part-time jobs. The table shows disaggregation of rate of female participation in population groups such as: quintile of income, education, number of children and household structure. Differences model includes fixed effects by country. CSA refers children's legal starting school age and CFA refers legal children's finishing school age, for more details look Bassi, Busso, and Muñoz (2015). Source: own calculations based on microdata from national household surveys. Robust standard errors clustered by country are reported in parenthesis. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Education is positively related to female labor force participation, particularly for women in higher income households, single women, and women with young children. Marriage is not significantly correlated with participation. An increase in fertility tends to reduce participation, on average. This negative effect is present in all groups of women, except those in the first quintile of the income distribution. An increase in wages and a reduction in discrimination apparently induce women to be in the labor force, although the effects are not statistically significant. When children attend school, women tend to work more than

when children are not attending school, suggesting that the expansion of preschools and schools in Latin America may have played an important part in the increase of the female labor supply. Moreover, a higher prevalence of home appliances in the household is associated with higher participation rates. Similarly, a higher prevalence of using modern contraceptive methods is positively correlated with the female labor supply. Culture is not correlated with the labor supply nor is the presence of a CCT program in the country. Finally, the effect of GDP is particularly important given how high GDP growth has been in the region since 2003. There is an overall negative and significant correlation between GDP growth and female labor force participation. Moreover, this negative correlation is much stronger for women in the lower quintile of the income distribution (of their husbands) and for less educated women. It is, thus, very likely that the recent stagnation in the increase of female labor force participation in the Latin America and the slower convergence between the participation of women in different groups can be partly explained by the higher rates of economic growth experienced in the region.

## **5. Discussion and conclusion**

Four major stylized facts of female labor supply were examined. First, there has been a long-term positive trend in female labor force participation. Second, there was virtually no change in the intensive margin (hours worked). Third, the region recently experienced stagnation in female labor force participation, and fourth, there has been some convergence between the disadvantaged (poor, less educated, and rural) and the advantaged (rich, more educated, and urban) groups within countries. However, this convergence also seems to have stopped in recent years.

Using a general conceptual framework, a set of determinants was extracted that might influence female labor force participation, and the mechanisms that might explain those effects were analyzed. Some of these determinants are individual behaviors that are jointly determined (by the individuals) with labor supply, such as education, marriage, and fertility choices. Other determinants are outside the control of the individual, such as returns to work at home, returns to work outside the home for a wage, technologies (health, home, and work), preferences, and decision-making structures. Considering this framework, a review of the literature and cross-country regression analysis were performed to assess each determinant's relative importance to explaining the factors.

Table 6 summarizes the results. The positive long-term trends that began in the 1950s were likely driven by the expansion of health and home technologies and by cultural changes that operate over a long period. These two social changes, together with policies that expanded educational opportunities, increased educational attainment and reduced fertility, which had a positive feedback effect on female labor force participation.

Table 6: Summary of importance of determinants

Determinants	Change in Latin America between 1990 and 2010	Contributor to long-term (1950-2010) female labor supply increase	Contributor to long-term (1990-2010) female labor supply increase	Contributor to convergence between advantage and disadvantaged group	Contributor to recent stagnation
Education	Increased	<b>Likely</b>	<b>Likely</b>	<b>Likely</b>	Unlikely
Marriage	Stable	Unlikely	Unlikely	Unlikely	Unlikely
Fertility	Decrease	<b>Likely</b>	<b>Likely</b>	<b>Likely</b>	Unlikely
Technology					
Health (Contraceptives, Formula)	Increase	<b>Likely</b>	<b>Likely</b>	Unknown	Unlikely
Home (Appliances, electricity)	Increase	<b>Likely</b>	Unlikely	Likely	Unlikely
Work (telework)	Probably stable	Unlikely	Unlikely	Unlikely	Unlikely
Labor Returns					
Gender Discrimination	Slight decrease, stagnated in 2000s	Unlikely	Likely	Likely	<b>Likely</b>
Macroeconomic conditions	--	Unlikely	Unlikely	Unlikely	<b>Likely</b>
Policies					
Labor Regulations	Stable	Unlikely	Unlikely	Unlikely	Unlikely
Taxation	Stable (slight improvement in 2000s)	Unlikely	Unlikely	Unlikely	Unlikely
CCTs	Large increase since mid 1990s	Unlikely	Unlikely	Unlikely	<b>Likely</b>
Childcare	Large increase	<b>Likely</b>	<b>Likely</b>	<b>Likely</b>	Unlikely
Culture	Better for women	<b>Likely</b>	<b>Likely</b>	<b>Likely</b>	Unlikely

Source: own calculations based on microdata from national household surveys and literature analysis.

Generally, these long-term trends continued through the 1990s. However, in the past three decades, there have been significant increases in the provision of subsidized child care, which likely explain the increase in female labor force participation over that period and the convergence between the female labor supply of poor and/or rural households with that of richer and/or urban households. The recent stagnation is likely caused in part by the higher rates of economic growth experienced in the region, the expansion of CCT programs and continuing gender discrimination in the region.

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# Appendix

Table 1: Female labor force participation statistics

	LFP by Husband's Income			LFP by Education			LFP by Fertility			LFP by Household structure		Total Worked Hours
	Labor Force Participation	2nd Decile	9th Decile	Less than complete secondary	Secondary complete	Tertiary Complete	At least 1 child age 0	At least 1 child age CSA to CFA	No children or children older than CFA	Nuclear Household	Single headed Household	
Early 1990s												
Argentina	57.52	44.86	55.95	48.25	60.08	83.01	42.09	49.81	58.97	51.72	80.70	18.42
Bolivia	66.53	76.48	49.54	65.71	55.96	85.91	63.55	65.07	64.68	62.92	88.80	40.75
Brazil	61.65	57.57	52.78	57.14	72.34	86.04	56.93	60.60	59.79	57.73	76.69	20.94
Chile	45.29	24.99	44.14	35.72	50.64	76.23	32.08	37.24	41.76	39.74	70.88	46.00
Costa Rica	40.80	21.13	39.95	32.06	55.95	74.86	30.38	35.53	36.94	33.92	68.58	40.69
Ecuador	59.39	40.82	60.79	53.22	65.51	87.29	56.56	57.55	55.45	55.72	78.96	40.44
El Salvador	53.12	32.19	55.20	48.70	77.07	89.02	42.67	49.42	50.40	46.86	69.89	24.01
Honduras	41.08	27.24	40.92	34.75	67.76	78.79	33.60	36.72	39.71	35.01	61.26	45.78
Mexico	42.61	31.65	38.18	36.72	58.09	76.81	34.50	37.63	39.47	36.96	68.78	37.86
Nicaragua	55.71	32.85	51.06	51.93	73.09	89.98	48.54	51.80	54.02	48.59	78.58	48.12
Panama	49.54	26.46	55.31	34.87	65.89	87.42	38.96	44.46	47.52	43.22	70.70	40.44
Paraguay	58.06	36.16	57.22	52.73	70.84	87.61	49.96	53.49	54.30	53.05	79.25	25.00
Peru	71.42	66.33	67.58	69.70	67.77	84.47	67.40	70.61	70.56	68.91	88.22	41.21
Uruguay	68.20	57.07	63.91	62.43	79.85	94.28	61.73	64.18	64.31	64.83	86.15	39.67
Venezuela	52.61	33.65	50.33	43.85	65.88	87.12	43.50	47.35	47.93	45.86	73.77	39.08
LAC Average	54.90	40.63	52.19	48.52	65.78	84.59	46.83	50.76	52.39	49.67	76.08	36.56
Early 2010s												
Argentina	68.10	50.98	70.07	55.17	67.54	88.85	57.26	62.00	70.56	62.88	85.97	21.73
Bolivia	74.73	73.27	63.71	74.29	68.61	86.29	66.59	73.51	77.21	70.65	90.22	45.03
Brazil	70.12	59.68	69.31	61.24	76.57	86.80	65.30	69.41	68.82	67.25	79.24	24.18
Chile	60.54	45.09	55.54	47.24	62.39	84.02	51.60	56.01	57.78	54.31	80.72	40.94
Costa Rica	58.61	39.68	58.34	48.14	68.32	86.78	47.30	52.25	56.43	51.92	77.24	40.00
Ecuador	63.01	47.57	57.22	55.30	65.74	88.20	54.14	59.41	60.90	57.18	85.26	39.35
El Salvador	60.94	41.14	57.70	54.99	72.33	88.73	48.86	58.48	60.47	55.17	74.95	43.01
Honduras	52.17	33.72	52.32	46.61	67.86	88.02	42.17	48.90	51.49	46.39	68.58	38.16
Mexico	55.67	41.72	49.63	49.43	62.14	79.22	42.97	50.92	54.63	50.33	76.68	39.87
Nicaragua	57.46	47.42	48.48	50.82	69.36	86.41	51.50	55.26	58.45	51.32	78.54	44.47
Panama	63.08	41.79	66.54	49.30	69.61	89.46	53.38	57.92	62.97	57.27	79.40	38.86
Paraguay	66.37	57.56	62.22	59.41	73.19	91.86	58.16	63.66	64.98	63.28	77.40	28.02
Peru	77.11	80.99	69.65	76.55	72.95	83.75	71.37	77.83	78.77	74.98	88.72	41.30
Uruguay	78.44	68.30	79.06	71.98	86.70	95.57	72.51	75.70	79.54	75.04	90.35	37.82
Venezuela	67.49	54.14	63.56	56.69	66.25	88.87	58.59	65.02	66.03	62.54	81.64	37.88
LAC Average	64.92	52.20	61.56	57.14	69.97	87.52	56.11	61.75	64.60	60.03	80.99	37.38

Notes: CSA refers children's legal starting school age and CFA refers legal children's finishing school age, for more details look Bassi, Busso, and Muñoz (2015). Source: own calculations based on microdata from national household surveys

**Table 2.a:: Possible determinants**

	Average years of Education	Number of Children	Shared Married Women	Contraceptive Prevalence	Households with electricity	Ratio wage (women/men)	Preschool enrolment rate	Catholic non- practicing
<i>Early 1990s</i>								
Argentina	10.70	1.89	93.08	52.06	99.61	0.99	48.82	57.66
Bolivia	6.60	2.91	73.25	19.30	71.86	0.78	34.23	56.52
Brazil	5.93	2.22	--	67.48	92.13	0.77	54.61	47.35
Chile	9.40	2.05	63.54	51.82	96.17	0.77	89.75	49.62
Costa Rica	7.65	2.48	57.13	66.94	96.97	0.97	33.59	49.80
Ecuador	7.63	2.90	64.30	46.30	91.03	0.80	47.36	38.10
El Salvador	5.24	2.66	34.30	48.36	76.75	0.76	26.06	43.15
Honduras	5.45	3.19	57.40	38.78	70.09	0.91	13.75	37.33
Mexico	6.70	2.81	74.77	56.76	95.85	0.80	65.15	13.17
Nicaragua	4.96	3.31	60.35	50.26	76.21	0.86	16.45	34.02
Panama	9.36	2.33	39.22	52.44	--	0.91	63.15	35.00
Paraguay	7.67	2.71	72.53	40.38	92.74	0.79	14.33	56.23
Peru	7.11	2.85	49.41	37.92	73.66	0.81	33.74	52.02
Uruguay	8.93	1.93	64.89	74.12	98.58	0.80	42.32	38.82
Venezuela	8.11	2.66	63.89	56.26	99.04	0.86	42.15	42.95
LAC Average	7.43	2.59	62.00	50.61	87.91	0.84	41.70	43.45
<i>Early 2010s</i>								
Argentina	11.64	1.84	60.78	63.28	99.67	0.99	73.85	54.69
Bolivia	8.79	2.45	68.61	36.08	90.27	0.82	48.62	46.68
Brazil	8.63	1.54	78.62	75.78	99.35	0.84	64.01	36.90
Chile	11.19	1.77	52.69	60.52	99.76	0.81	99.34	42.35
Costa Rica	9.01	1.91	52.41	77.04	99.53	0.99	71.69	33.66
Ecuador	9.45	2.13	64.16	59.88	97.87	0.89	128.95	41.36
El Salvador	7.37	2.11	58.61	63.88	93.65	0.97	61.33	17.42
Honduras	6.44	2.59	55.72	61.70	82.07	0.87	42.35	25.62
Mexico	8.89	2.09	66.36	67.12	99.44	0.89	99.22	47.63
Nicaragua	6.66	2.50	57.95	74.12	79.76	0.90	54.97	26.61
Panama	10.75	1.98	66.83	50.02	--	1.02	63.62	38.55
Paraguay	8.73	2.36	64.48	67.90	98.49	0.83	35.02	40.63
Peru	9.22	2.27	63.21	50.64	90.63	0.76	76.54	47.35
Uruguay	10.21	1.62	63.21	73.96	99.50	0.87	88.08	33.19
Venezuela	10.61	2.04	61.50	63.34	99.64	0.91	73.04	50.01
LAC Average	9.17	2.08	61.43	63.02	94.97	0.89	72.04	38.84

Notes: Interpolated variables. Appliances index includes data of wash machine, car, motorcycle and electricity.

Source: own calculations based on microdata from national household surveys

**Table 2.b: Possible determinants**

	Maximum permitted work hours per week	Paternity leave (days)	Maternity leave (weeks)	Abortion law	Minimum percent overtime remuneration	Index hiring and wage regulation s	CCT beneficiari es (Millions)
<i>Year 2012</i>							
Argentina	52	2	13	To protect mother's life, health & others	50	3.9	11.79
Bolivia	60	0	9	To protect mother's life, health & others	100	2.23	5.69
Brazil	46	5	17	Just to save mother's life	50	2.23	52.39
Chile	57	5	18	Not permitted	50	6.67	1.3
Costa Rica	72	0	17	To protect mother's life, health & others	50	2.23	0.19
Ecuador	52	10	12	To protect mother's life, health & others	50	5.57	6.13
El Salvador	No universal national limit	0	12	Not permitted	100	6.67	0.57
Honduras	60	0	10	Not permitted	25	0	1.07
Mexico	57	0	12	Just to save mother's life	100	6.67	27.25
Nicaragua	57	0	12	Not permitted	100	6.67	--
Panama	57	0	14	Just to save mother's life	25	2.23	0.36
Paraguay	57	2	12	Just to save mother's life	50	5.57	0.55
Peru	No universal national limit	4	13	To protect mother's life, health & others	25	3.9	2.59
Uruguay	56	3	12	To protect mother's life, health & others	100	6.67	0.76
Venezuela	46	14	18	Just to save mother's life	50	3.33	--

Notes: CCT beneficiaries for 2010.

Source: own calculations based on microdata from national household surveys.



**Table 3: Literature review (effect sizes)**

ID	Topic	Subtopic	Period	Authors	Sample
1	CCT	Programa de Asignación Familiar (PRAF)	2000-2002	Alzúa, Cruces and Ripani (2012)	Females (adult)
2	CCT	PROGRESA	1997-1999	Alzúa, Cruces and Ripani (2012)	Females (adult). Rural. Round: 1998
3	CCT	PROGRESA	1997-1999	Alzúa, Cruces and Ripani (2012)	Females (adult). Rural. Round: 1999
4	CCT	Red de Protección Social (RPS)	2000-2002	Alzúa, Cruces and Ripani (2012)	Females (adult). Rural. Round: 2001
5	CCT	Red de Protección Social (RPS)	2000-2002	Alzúa, Cruces and Ripani (2012)	Females (adult). Rural. Round: 2002
6	CCT	Elderly transfers	1993	Bertrand et al (2003)	Females relatives in three generation households with elderly 16-50 years old
7	CCT	Ingreso Ciudadano	2006-2007	Borraz and Gonzales (2009)	Females (22-55) w/children aged 6-14
8	CCT	Ingreso Ciudadano	2006-2007	Borraz and Gonzales (2009)	Females (22-55) w/children aged 6-14
9	CCT	Juntos	2009	Fernandez and Saldarriaga (2014)	All Females recipient of CCT
10	CCT	Juntos	2009	Fernandez and Saldarriaga (2014)	Married females recipient of CCT
11	CCT	Juntos	2009	Fernandez and Saldarriaga (2014)	Mothers recipient of CCT with children aged <5
12	CCT	Red de Protección Social (RPS)	2000-2002	Maluccio and Flores (2005)	Females (15+)
13	CCT	Programa de Asignación Familiar (PRAF)	2000-2002	Novella, Ripani, Cruces and Alzúa (2012)	Mother's in intact households
14	CCT	PROGRESA	1997-1999	Novella, Ripani, Cruces and Alzúa (2012)	Mother's in intact households. Rural
15	CCT	Red de Protección Social	2000-2001	Novella, Ripani, Cruces and Alzúa (2012)	Mother's in intact households. Rural
16	CCT	PROGRESA	1997-1999	Parker and Skoufias (2000)	Females (18-24)
17	CCT	PROGRESA	1997-1999	Parker and Skoufias (2000)	Females (25-34)
18	CCT	PROGRESA	1997-1999	Parker and Skoufias (2000)	Females (35-44)
19	CCT	PROGRESA	1997-1999	Parker and Skoufias (2000)	Females (45-54)
20	CCT	PROGRESA	1997-1999	Parker and Skoufias (2000)	Females (55+)
21	CCT	Bolsa Familia	2001-2006	Ribas and Veras (2011)	Females. Round=2004
22	CCT	Bolsa Familia	2001-2006	Ribas and Veras (2011)	Females. Round=2004
23	CCT	Bolsa Familia	2001-2006	Ribas and Veras (2011)	Females. Round=2004
24	CCT	Bolsa Familia	2001-2006	Ribas and Veras (2011)	Females. Round=2006
25	CCT	Bolsa Familia	2001-2006	Ribas and Veras (2011)	Females. Round=2006
26	CCT	Bolsa Familia	2001-2006	Ribas and Veras (2011)	Females. Round=2006
27	Child care	Public child care provision	1991-2005	Bauernschuster and Schlotter (2013)	Mothers, youngest child born 1992-2000
28	Child care	Preschool entrance age	1995-2001	Berlinski, Galiani and McEwan (2011)	Mothers
29	Child care	Public Preschool	1950-1990	Cascio (2006)	Single mother 5 or 6 years old , no younger children
30	Child care	Public Preschool	1950-1990	Cascio (2006)	Single mother 5 or 6 years old , old and younger children
31	Child care	Public Preschool	1950-1990	Cascio (2006)	married mother 5 or 6 years old , no younger children
32	Child care	Public Preschool	1950-1990	Cascio (2006)	married mother 5 or 6 years old , old and younger children
33	Child care	longer school day	1990-2006	Contreras, Sepúlveda and Cabrera (2010)	Females (20-29)
34	Child care	longer school day	1990-2006	Contreras, Sepúlveda and Cabrera (2010)	Females (20-65)
35	Child care	longer school day	1990-2006	Contreras, Sepúlveda and Cabrera (2010)	Females (30-39)
36	Child care	longer school day	1990-2006	Contreras, Sepúlveda and Cabrera (2010)	Females (40-49)
37	Child care	longer school day	1990-2006	Contreras, Sepúlveda and Cabrera (2010)	Females (50-65)
38	Child care	Preschool enrolment	1999	Gaux and Maurin (2010)	Mother youngest child born Dec95-Jan96 (Single mother families)
39	Child care	Preschool enrolment	1999	Gaux and Maurin (2010)	Mother youngest child born Dec95-Jan96 (two -parent families)
40	Child care	Preschool enrolment	1999	Gaux and Maurin (2010)	Mother youngest child born or Dec96-Jan97 (Single mother families)
41	Child care	Preschool enrolment	1999	Gaux and Maurin (2010)	Mother youngest child born or Dec96-Jan97 (two -parent families)
42	Child care	subsidized childcare	1997–2004	Lefebvre, Merrigan and Verstraete (2009)	Mothers with at least one child 6–11 and no children < 6
43	Child care	public day care supply	2003-2008	Medrano (2009)	Poor females (15-45) with children at most two years old
44	Child care	free publicly provided child care	1987-1997	Nollenberger and Rodriguez-Planas (2011)	Mothers between 18 and 45 years. Excluded Pais Vasco and Navarra
45	Child care	free publicly provided child care	1987-1997	Nollenberger and Rodriguez-Planas (2011)	Mothers between 18 and 45 years. Excluded Pais Vasco and Navarra
46	Child care	free publicly provided child care	2007-2008	Paes de Barros, Olinto, Lunde and Carvalho (2011)	Mothers with children 0-3
47	Child care	Public Preschool	1998-2003	Schlosser (2011)	Mothers of children aged 2-4
48	Child care	Public Preschool	1998-2003	Schlosser (2011)	Mothers whose youngest child is aged 2-4

ID	Topic	Subtopic	Period	Authors	Sample
50	Crisis	Added worker effect	1998-2002	Martinoty (2013)	Married women on working age
51	Crisis	Added worker effect	1993,1997,2000-2007	Posadas and Sinha (2010)	Female spouse, both couple members below 95 years of age. No split 1997-2007. Women working because husband lost his job
52	Culture	Second-generation Americans	1970	Fernandez (2006)	Second-generation married females, 30-40 years old
53	Culture	Second-generation Americans	1970	Fernández and Fogli (2009)	Married females, ages 30–40
54	Fertility	More than 2 children	1990	Angrist and Evans (1998)	All mothers (21-35) with at least 2 children
55	Fertility	More than 2 children	1980	Angrist and Evans (1998)	All mothers (21-35) with at least 2 children
56	Fertility	More than 2 children	1980	Angrist and Evans (1998)	Married mothers (21-35) with at least 2 children
57	Fertility	More than 2 children	1990	Angrist and Evans (1998)	Married mothers (21-35) with at least 2 children
58	Fertility	Early access to the pill	1970-1990	Bailey (2006)	Females (21-25)
59	Fertility	Early access to the pill	1970-1990	Bailey (2006)	Females (26-30)
60	Fertility	Early access to the pill	1970-1990	Bailey (2006)	Females (31-35)
61	Fertility	Early access to the pill	1970-1990	Bailey (2006)	Females (36-40)
62	Fertility	Early access to the pill	1970-1990	Bailey (2006)	Females (41-44)
63	Fertility	Abortion laws	1960-2000 (5 Years)	Bloom, Canning, Fink and Finlay (2007)	Females (15-19)
64	Fertility	Abortion laws	1960-2000 (5 Years)	Bloom, Canning, Fink and Finlay (2007)	Females (20-24)
65	Fertility	Abortion laws	1960-2000 (5 Years)	Bloom, Canning, Fink and Finlay (2007)	Females (25-29)
66	Fertility	Abortion laws	1960-2000 (5 Years)	Bloom, Canning, Fink and Finlay (2007)	Females (30-34)
67	Fertility	Abortion laws	1960-2000 (5 Years)	Bloom, Canning, Fink and Finlay (2007)	Females (35-39)
68	Fertility	Abortion laws	1960-2000 (5 Years)	Bloom, Canning, Fink and Finlay (2007)	Females (40-44)
69	Fertility	Abortion laws	1960-2000 (5 Years)	Bloom, Canning, Fink and Finlay (2007)	Females (45-49)
70	Fertility	Abortion laws	1960-2000 (5 Years)	Bloom, Canning, Fink and Finlay (2007)	Females (50-54)
71	Fertility	Abortion laws	1960-2000 (5 Years)	Bloom, Canning, Fink and Finlay (2007)	Females (55-59)
72	Fertility	Abortion laws	1960-2000 (5 Years)	Bloom, Canning, Fink and Finlay (2007)	Females (60-64)
73	Fertility	In vitro fertilization (IVF) treatment	1994-2005	Lundborg, Plug and Würtz Rasmussen (2014)	All Females who received at least one IVF treatment
74	Fertility	In vitro fertilization (IVF) treatment	1994-2005	Lundborg, Plug and Würtz Rasmussen (2014)	All Females who received at least one IVF treatment
81	Macro	Financial crisis	2001-2002	McKenzie (2003a)	Female (25-60) Participation Female (25-55) Hours
82	Macro	Development/GDP	1890-2005	Olivety (2013)	Female
84	Macro	Financial crisis	1980–2005	Signorelli,Choudhry and Marelli (2012)	Female
85	Macro	Financial crisis	1980–2005	Signorelli,Choudhry and Marelli (2012)	Female
86	Macro	Financial crisis	1980–2005	Signorelli,Choudhry and Marelli (2012)	Female
88	Marriage	Divorce laws	1994-2001	Bargain (2012)	Married females
90	Marriage	Added worker effect	1979-1981	Blau and Kahn (2004)	Married females age 24-54 with spouse with age 24 - 54
91	Marriage	Added worker effect	1999-2001	Blau and Kahn (2004)	Married females age 24-54 with spouse with age 24 - 54
92	Marriage	Added worker effect	1989-1991	Blau and Kahn (2004)	Married females age 24-54 with spouse with age 24 - 54
93	Marriage	Spouse health coverage	1989-2000	Cebi (2013)	Married women with intact marriage 1989-2000 her age and her husband age 25-64, health insurance info available not covered public health insurance
94	Marriage	Health Insurance	1979-1985	Chou and Szaiger (2001)	Married women ages 20-65 whose husbands are paid employees
95	Marriage	Increase demand women work	1950	Goldin and Olilveti (2013)	White women 25-34 with 12 or more years education, in their first marriage, no farming
96	Marriage	Increase demand women work	1950	Goldin and Olilveti (2013)	White women 25-34 with 12 or more years education, in their first marriage, no farming
97	Marriage	Increase demand women work	1950	Goldin and Olilveti (2013)	White women 25-34 with 12 or more years education, in their first marriage, no farming
98	Marriage		1998-2002	Lee (2008)	Women between 19 and 32
99	Policies	minimum wage regulation	1970-2008	Addisson and Ozturk (2012)	Females (25-54)
100	Policies	Parental leave	1990-2010	Blau and Kahn (2013)	Females (25-54)
107	Policies	Unemployment insurance during husband's unemployment spell	1984-1992	Cullen and Gruber (2000)	Married females with unemployed husbands
108	Policies	Added worker effect	1994-2009	Gaux (2014)	Married or cohabiting individual aged 18-65, spouse wage earner
109	Policies	Maternal Leave	1985-1999	Jaumotte (2003)	Women 25-54 years
110	Policies	Tax reduction	1985-1999	Jaumotte (2003)	Women 25-54 years
111	Policies	Anti-discrimination law	1968-1979	Mukhopadhyay (2012)	Pregnant women
112	Policies	Maternal Leave	1999-2010	Rossin-Slater et al (2011)	Women with a youngest children in the households
113	Policies	Maternal Leave	1999-2010	Rossin-Slater et al (2011)	Women with a youngest children in the households

ID	Topic	Subtopic	Period	Authors	Sample
114	Policies	Maternal Leave	1999-2010	Rossin-Slater et al (2011)	Women with a youngest children in the households
117	Taxes	Reform replaced a spousal tax exemption with a nonrefundable tax credit	1986-1991	Crossley and Jeon (2006)	Females married to higher income husbands
118	Taxes	Tax reduction / Transfer	1985-1997	Eissa & Hoynes (2004)	Married wives couples residing in the same household 25-54 years old
119	Taxes	Tax reduction	1984-1992	Eissa (2002)	Married females, high-income
121	Taxes	reduction in effective marginal tax rate	1986-1991	Jeon (2004)	Females married to higher income husbands
122	Technology and Infrastructure	household appliances	1940-1950	Cardia (2010)	Females
123	Technology and Infrastructure	household appliances	1940-1950	Cardia (2010)	Females
124	Technology and Infrastructure	household appliances	1940-1950	Cardia (2010)	Females
125	Technology and Infrastructure	household appliances	1960-1970	Coen-Priani et al (2010)	Married females (18-55), white
126	Technology and Infrastructure	Internet	2000-2009	Dettling (2014)	Married females (18-59)
127	Technology and Infrastructure	rural electrification	1998-2005	Grogan and Sadanand (2012)	Female (20-55)
128	Technology and Infrastructure	Commuting time	1980-1990-2000	Kalesnikova (2007)	White married women with children none under 5 H School
129	Technology and Infrastructure	Commuting time	1980-1990-2000	Kalesnikova (2007)	White married women with children none under 5 H collage
130	Technology and Infrastructure	Commuting time	1980-1990-2000	Kalesnikova (2007)	White married women with children under 5 High School
131	Technology and Infrastructure	Commuting time	1980-1990-2000	Kalesnikova (2007)	White married women with children under 5 High collage
132	Technology and Infrastructure	Commuting time	1980-1990-2000	Kalesnikova (2007)	White married women, No children High School
133	Technology and Infrastructure	Commuting time	1980-1990-2000	Kalesnikova (2007)	White married women, No children collage

Source: own calculations based literature analysis.

**Table 4: Factor analysis**

Variable	Component	Factor Loadings
<b>Appliances in the household</b>	% women households with washing machine	0.891
	% women households with car	0.978
Eigenvalue: 2.91390	% women households with motorcycle	0.650
Alpha: 0.7954	% women households with electricity	0.861
<b>Children in the school</b>	% household children enrolled at school	0.934
	Net enrolment rate. Pre-primary. Total	0.828
Eigenvalue: 3.28206	Net enrolment rate. Primary. Total	0.880
Alpha: 0.6576	Gross enrolment ratio. Secondary. Total	0.974
<b>Constraints open business (Factor)</b>	Administrative requirements	0.832
	Starting a business	0.785
Eigenvalue: 2.81410	Licensing restrictions	0.733
Alpha: 0.7206	Business regulations	0.984

Source: own calculations based on microdata from national household surveys.