

Bridging gender gaps?

The rise and deceleration of female labor
force participation in Latin America

**Leonardo Gasparini
& Mariana Marchionni**
EDITORS

C|E|D|L|A|S

Center for Distributive, Labor and Social Studies
Facultad de Ciencias Económicas | Universidad Nacional de La Plata

One of the most salient socioeconomic changes over the last half-century has been the strong rise in female labor force participation across the world. Latin America has not been an exception. However, since the early 2000s, there are signs of a widespread and significant deceleration in women's entry into labor markets in Latin America. The slowed increase of women in the workforce has delayed the closing of the gender gap in labor participation, and may also compromise poverty reduction targets.

This book, written at CEDLAS-Universidad Nacional de La Plata, documents the recent deceleration of female labor participation in Latin America, explores its causes, evaluates its implications, and discusses the limitations and challenges facing public policies that aim to empower women and foster gender equality.

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CEDLAS

Center for Distributive, Labor and Social Studies

Facultad de Ciencias Económicas

Universidad Nacional de La Plata

Calle 6 entre 47 y 48, 3er piso, oficina 322

[1900] La Plata, Argentina

Phone: [+54 221] 4229383

Fax: [+54 221] 4229383

E-mail: cedlas@depeco.econo.unlp.edu.ar

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List of authors

Leonardo Gasparini

CEDLAS (Facultad de Ciencias Económicas, Universidad Nacional de La Plata) and CONICET

Mariana Marchionni

CEDLAS (Facultad de Ciencias Económicas, Universidad Nacional de La Plata) and CONICET

Nicolás Badaracco

CEDLAS (Facultad de Ciencias Económicas, Universidad Nacional de La Plata)

Matías Busso

Inter-American Development Bank and visiting researcher CEDLAS

Pablo Gluzmann

CEDLAS (Facultad de Ciencias Económicas, Universidad Nacional de La Plata) and CONICET

Darío Romero Fonseca

Inter-American Development Bank

Joaquín Serrano

CEDLAS (Facultad de Ciencias Económicas, Universidad Nacional de La Plata) and CONICET

Evelyn Vezza

Visiting researcher CEDLAS (Facultad de Ciencias Económicas, Universidad Nacional de La Plata)

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List of acronyms

ALMP	Active labor market policy
CCT	Conditional cash transfer
CEDLAS	Centro de Estudios Distributivos, Laborales y Sociales - Universidad Nacional de La Plata, Argentina
CIEDUR	Centro Interdisciplinario de Estudios sobre el Desarrollo, Uruguay
ECLAC	Economic Commission for Latin America and the Caribbean
GDP	Gross domestic product
IDRC	International Development Research Centre
ILO	International Labor Organization
LABLAC	Labor Database for Latin America and the Caribbean (CEDLAS and the World Bank)
LFP	Labor force participation
MDG	Millennium Development Goals
OECD	Organisation for Economic Co-operation and Development
PPP	Purchasing power parity
SEDLAC	Socio-Economic Database for Latin America and the Caribbean (CEDLAS and the World Bank)
TFR	Total fertility rate
WDI	World Development Indicators

“Among the many useful indicators of women’s economic status, including women’s educational attainment, health, role in politics and legal rights, labor force participation is arguably the most fundamental to the evolution of gender roles.”

Olivetti, 2013

“Of the many advances in society and the economy in the last century, the converging roles of men and women are among the grandest.”

Goldin, 2014

Chapter 4

Characterizing female participation changes

Leonardo Gasparini, Mariana Marchionni,
Nicolás Badaracco and Joaquín Serrano

1. Introduction

Over the last decades the Latin American economies have experienced substantial changes in their labor markets. The steep increase in female labor force participation stands out as one of the main transformations. Latin American women have been increasingly taking part in the labor force: on average for the region, the share of adult women who are employed or looking for a job climbed from around 50% in the early 1990s to 65% two decades later. As documented in the previous chapter, this remarkable increase has not been smooth: while growth was steep in the 1990s, it significantly decelerated in the next decade.

Disentangling all the factors that may account for the observed pattern in female labor supply is not an easy task, since several potential driving factors were simultaneously at play during the period under study. Endogeneity issues and lack of data are among the serious obstacles for the empirical identification of the causal links between female participation and its covariates.

Since a comprehensive general equilibrium assessment of all of the driving factors is not feasible, we take a more modest approach in this book: we deploy several empirical strategies that contribute with pieces of evidence to the assessment of the relevance of different plausible factors behind the observed patterns in female labor supply. Although certainly imperfect and incomplete, we expect that this patchwork of evidence will shed some light on the processes that have shaped female LFP in Latin America.

This chapter makes a first step toward that goal by analyzing whether the patterns in female LFP are mainly accounted for by changes in the distribution

of some direct determinants of the labor supply decision, or if they are chiefly the consequence of some more profound transformation in behavior.

To illustrate this point, assume that individuals can have either high or low education, and that they can work in one of two sectors, white or blue-collar. There are theoretical reasons and empirical evidence supporting the fact that high-educated people tend to participate more in the labor market, while white-collar jobs tend to have a larger than average female-to-male employment ratio. In this framework, an exogenous increase in women's education and a change in the productive structure of the economy toward white-collar jobs may foster female labor force participation. Notice that this would be the case even with no changes in the individual propensity to participate in the labor market conditional on education, and with no changes in the propensity to employ female workers in each sector. The increase in female LFP would be the "natural" consequence of a change in the distribution of two of its main determinants.

In this chapter we carry out a set of decompositions that try to isolate the direct effect of some of these changes on female labor force participation. The methodology is applied to household survey microdata for the Latin American countries during the period 1992-2012, exploiting a dataset that includes homogeneous definitions for the education, demographic and labor variables involved in the analysis.

The results of the decompositions suggest that changes in education, marriage, fertility, and location all favored a more intense labor market involvement among women. Adult females are now more educated, have fewer children and are more likely to be single than they were two decades ago. In this scenario, even with the same conditional propensity to participate, the overall female LFP should increase.

The contribution of this *composition effect* to the observed increase in female LFP was significant, and remained roughly of the same size over the last two decades. However, the relative impact was higher in the 2000s: without the observed educational and demographic changes in the female population, the deceleration in the growth of female LFP in Latin America in the 2000s (documented in the last chapter) would have been even more marked.

The chapter provides some evidence that suggests that changes in the structure of employment toward tasks more frequently performed by women may have also contributed to an increase in female LFP in the region. By contrast, changes in the sectoral structure of the economy may have operated in direction of the observed deceleration in female LFP, although that impact was probably rather small.

The rest of this chapter is organized as follows. In section 2 we explain the methodology and introduce the data, whereas in section 3 we present and discuss the main results. Section 4 is devoted to the assessment of the impact of changes in the sectoral structure of the economy on female employment. Section 5 closes with some concluding remarks.

2. Data and methodology

In order to assess the impact of changes in the distribution of some variables on the aggregate rate of female labor force participation, we implement a decomposition in which the population of potential female workers (in our case, those aged 25 to 54) are divided according to some potential covariate of labor participation, like educational levels. The change in the aggregate rate of female LFP over time could be decomposed into two terms: a weighted average of the changes in LFP within groups (the *within* effect) and a weighted average of the changes in the share of women in each group (the *composition* effect).¹ If changes in the distribution of the variable used to define the groups are the main drivers of changes in LFP, the second term will be relatively large.

Analytically, the overall rate of female labor force participation P_t can be expressed as a weighted average of the LFP rates of all the groups k

$$P_t = \sum_k P_{kt} \cdot \omega_{kt}$$

where P_{kt} is the participation rate for group k at time t and ω_{kt} is the fraction of women in group k at time t . The change in female LFP over time can then be decomposed into a change in participation rates within groups, and changes in the structure of the female population across groups.

$$P_{t+1} - P_t = \frac{1}{2} \left[\sum_k \omega_{kt} (P_{kt+1} - P_{kt}) + \sum_k \omega_{kt+1} (P_{kt+1} - P_{kt}) \right] \\ + \frac{1}{2} \left[\sum_k P_{kt} (\omega_{kt+1} - \omega_{kt}) + \sum_k P_{kt+1} (\omega_{kt+1} - \omega_{kt}) \right]$$

Rearranging,

$$\Delta P_t = \underbrace{\sum_k \bar{w}_k \Delta P_k}_{\text{Within}} + \underbrace{\sum_k \bar{P}_k \Delta w_k}_{\text{Composition}}$$

1 See Elías and Ñopo (2010) and Amador *et al.* (2013), among others who implement this decomposition.

where $\bar{w}_k = (w_{kt} + w_{kt+1})/2$ and $\bar{P}_k = (P_{kt} + P_{kt+1})/2$, and Δ stands for changes between time t and $t+1$. We implement this methodology dividing the population alternatively by education, age, marital status, number/age of children, and area of residence (urban-rural).

Identifying all the causal links between labor participation and its covariates is extremely difficult and typically requires a structural general equilibrium model. Carrying out this analysis for one country would be extremely arduous; it would be impossible for the whole region. Here, we take a more modest approach by performing a set of simple decompositions, which implies assuming that the main determinants of the changes in education (or other covariates) are mostly determined by factors that are not affected by LFP issues, and that the propensity to participate in the margin will be similar than that of the mean. At least for education, we believe that these are not very strong assumptions.

As in the rest of the study, the main source of data for this chapter is the Socio-Economic Database for Latin America and the Caribbean (SEDLAC), jointly developed by the CEDLAS and the World Bank. This database contains information on more than 300 national household surveys conducted in all Latin American countries. All variables in SEDLAC are constructed using consistent criteria across countries and years, and identical programming routines. In this paper we use microdata for 15 Latin American countries, covering the period 1992-2012.

3. Results for labor force participation

The decompositions require dividing the female population into groups according to variables that are potentially relevant determinants of the labor supply outcome. To motivate the selection of this set of variables we present the results of a probit model for female labor force participation at the individual level, estimated with microdata from the latest national household survey in each Latin American country. The dependent variable is equal to one if a given woman (aged 25 to 54) participates in the labor market and zero otherwise. The main regressors are variables that indicate the individual's marital status, education, children, age, location, and income from other non-labor sources and other family members. These variables are chosen because they belong to the intercept between the set of variables identified by the economic theory as relevant determinants of the female labor supply (Killingsworth and Heckman, 1986), and the set of variables commonly included in the Latin American household surveys (SEDLAC, 2015).

Although there are heterogeneities, the main results of the probit regressions hold in all countries (Table 4.1 in the Appendix). Marital status is strongly associated with the participation decision: on average, being married/cohabiting decreases the probability of labor force participation by around 22 percentage points, as compared to not living with a partner. Except for the case of Nicaragua, in all Latin American countries the coefficients for this variable are negative and highly significant, ranging from around 15 pp in Brazil, Dominican Republic, Uruguay and Venezuela, to more than 30 pp in Costa Rica, Ecuador, and Guatemala. The median estimate is similar to the mean: 22 points.

As expected, the effect of education is also very relevant. On average, having a primary education degree is associated with an increase in the probability of participating of 3 pp when compared to women who have not completed that basic educational level (the median is 4 pp). The increase associated with a secondary school degree is on average 10 pp, while it rises to 29 pp for a college degree. The median values are 13 and 26, respectively. In almost all countries female labor force participation is monotonically increasing in education (Figure 4.1 in the Appendix).

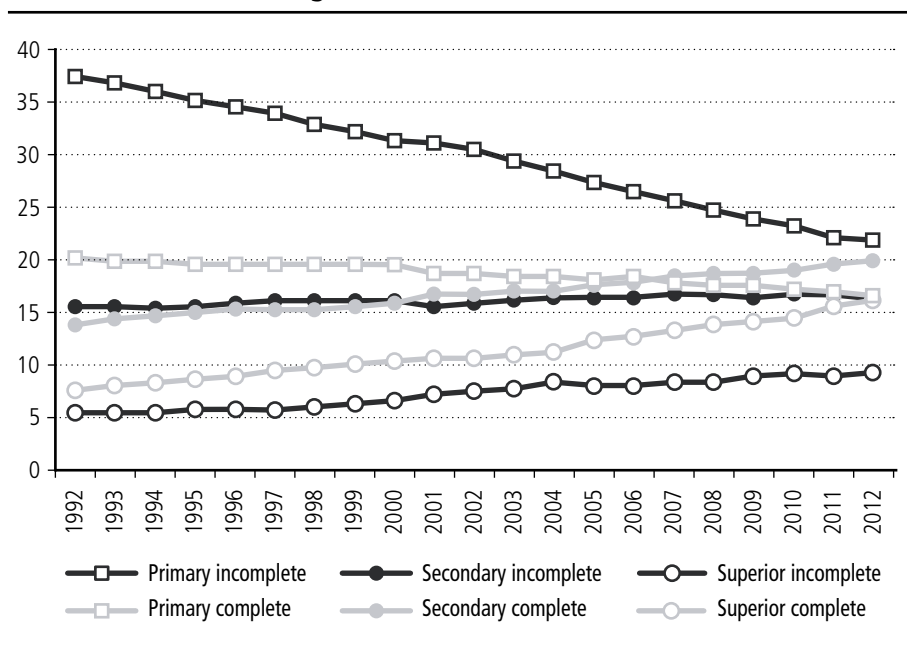
Women's fertility appears somewhat less tightly related to participation: according to the probit models, on average, having children under the age of 5 is associated with a reduction of 7 pp in the probability of participating, as compared to childless women. The estimates range from a non-significant effect in several countries to 21 pp in Costa Rica. Countries are more heterogeneous regarding the sign and the size of the coefficient of the dummy for having children. In most cases it is positive, although small.

The urban dummy is positive and significant in most countries, suggesting higher female participation in urban labor markets conditional on other factors, although the result is not general for all Latin American economies. The last rows in Table 4.1 indicate that labor force participation for adult women is decreasing in non-earned income. Keeping all other factors constant, a higher non-labor income reduces the probability of participating in the labor market. The same seems true for incomes from other family members, although there is more variability across countries.

This characterization illustrates the relevance of some factors—education, marriage, children, age, area of residence—in accounting for the labor force participation decision. Changes in the distribution of these variables may affect the aggregate level of female LFP in each country. In order to explore that possibility, we apply the decomposition methodology explained in the previous section.

We begin our discussion of the results by focusing on one of the main determinants of female labor force participation: education. In chapter 2 we highlighted the remarkable increase in education in all Latin America countries over the last decades, particularly among women. Figure 4.2 illustrates this phenomenon by dividing the population of adult women (aged 25 to 54) into six groups according to their attained educational levels. The progress is undeniable: while on average in 1992 more than a third of Latin American adult women had not finished primary school, in 2012 that share fell to around one fifth. On the other hand, the share of adult women with a tertiary degree increased from 8% to 10% in the 1990s, and then strongly climbed to 17% in the following decade.

Figure 4.2: Changes in composition of women by educational level Latin America. Women aged 25-54.



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

As was discussed above, female labor force participation is strongly linked to formal education. While, on average, roughly half of Latin American women with incomplete primary school are active in the labor market, that share climbs to almost 90% for those with a tertiary education degree (Table 4.2).

**Table 4.2: Female LFP by education
Latin America. Women aged 25-54.**

	Female LFP			Shares		
	1992	2002	2012	1992	2002	2012
Primary incomplete	43.5	50.7	51.7	36.4	29.5	21.0
Primary complete	47.8	56.0	58.0	19.9	18.6	16.4
Secondary incomplete	54.2	61.1	62.3	16.3	16.2	16.5
Secondary complete	63.7	68.2	68.0	13.8	17.1	20.3
Superior incomplete	68.5	75.7	73.9	5.7	7.9	9.3
Superior complete	83.9	86.5	87.8	7.8	10.7	16.5
Total	53.0	62.1	65.7	100.0	100.0	100.0

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

Note: unweighted means.

If more women have access to higher levels of education, which are linked to higher labor participation, then the process of education expansion could be the main driver of the global increase in female LFP. The results of the decomposition, presented in Table 4.3, help to assess this hypothesis. On average, female LFP increased 9.1 points in the 1990s.² The within effect accounts for 6.6 points, meaning that if no changes in education had occurred in that decade, female LFP would have nonetheless increased by that amount. The composition effect suggests that if the propensity to participate in the labor market had not changed within groups over the decade, female LFP would have nonetheless increased 2.5 points due to a more educated composition of the female population.

**Table 4.3: Decomposition of changes in female LFP by education
Latin America. Women aged 25-54.**

	1992-2002	2002-2012	1992-2012
Difference	9.1	3.6	12.7
Effects			
Within	6.6	0.9	7.4
Composition	2.5	2.7	5.3

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

Note: unweighted means.

2 There are some small differences between the figures in these exercises and those reported in chapter 3 due to some methodological issues in implementing the decompositions.

Interestingly, while the within effect is dominant in the 1990s, it substantially shrinks in the 2000s and becomes dominated by the composition effect. In fact, the latter effect remains stable over time: the education expansion was smooth, implying a stable impact over female labor market participation. The small within effect in the 2000s is the result of the negligible increase in female LFP in most education groups, documented in the first panel of Table 4.2.

In summary, the increase in female LFP in the 2000s was not only modest compared to that of the 1990s, but also mostly driven by the enhanced education structure of the female population, as opposed to an autonomous increase in participation within education groups.

As can be seen from the equations in section 2, the within and composition effects can be decomposed into the contributions of each educational level. The large relevance of the within effect in the 1990s is mostly accounted for by a strong increase in LFP among women without a secondary degree (Table 4.4). The dramatic fall in the relevance of the within effect in the 2000s is explained by the reduction in the rate of increase of LFP in all educational levels but, again, the change in behavior among less-educated women seems to have been crucial. As for the composition effect, Table 4.4 reveals that while in the 1990s the increase in the shares of both the secondary complete and the tertiary complete groups were equally important in pushing female LFP up, the role of the latter group was crucial in the 2000s. This is consistent with the acceleration in the growth of female college graduates during that decade.

Table 4.4: Within and composition effects by education levels Latin America. Women aged 25-54.

	Within			Composition		
	1992-2002	2002-2012	1992-2012	1992-2002	2002-2012	1992-2012
Primary incomplete	2.1	0.3	2.1	-3.0	-4.6	-7.3
Primary complete	1.7	0.3	1.9	-0.6	-1.3	-1.8
Secondary incomplete	1.2	0.3	1.5	-0.2	0.2	0.0
Secondary complete	0.8	0.1	1.0	2.4	2.2	4.5
Superior incomplete	0.5	-0.1	0.4	1.6	1.0	2.6
Superior complete	0.3	0.1	0.5	2.4	5.1	7.4
Total	6.6	0.9	7.4	2.5	2.7	5.3

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

Note: unweighted means.

This general story for the region applies to several countries when taken individually, such as Argentina, Honduras, and Paraguay (Table 4.5). In some economies, the within effect in the 2000s is even negative: such is the case in Bolivia, Brazil, Ecuador, Nicaragua, and Venezuela. For others, the within effect in the 2000s remains larger than the composition effect, but it is smaller than it was the previous decade; Chile, Costa Rica, Panama, and Uruguay belong to that group. Finally, in a few countries, the story seems to have been different: in El Salvador the composition effect dominated in the 1990s but not in the 2000s, while in Peru the within effect picked up in the latter decade.

**Table 4.5: Decomposition of changes in female LFP by education
Latin American countries. Women aged 25-54.**

	1992-2002	2002-2012	1992-2012
Argentina			
Total change	11.9	4.0	15.9
Within	8.8	1.3	9.7
Composition	3.1	2.7	6.1
Bolivia			
Total change	10.9	1.4	12.3
Within	11.2	-0.1	10.8
Composition	-0.3	1.5	1.5
Brazil			
Total change	6.4	2.6	8.9
Within	4.4	-1.7	2.6
Composition	2.0	4.2	6.4
Chile			
Total change	13.9	6.4	20.4
Within	8.2	4.5	13.1
Composition	5.7	2.0	7.3
Costa Rica			
Total change	13.0	8.2	21.2
Within	9.7	6.3	15.8
Composition	3.3	2.0	5.4
Ecuador			
Total change	8.3	-7.6	0.7
Within	7.3	-10.4	-3.4
Composition	1.0	2.8	4.1
El Salvador			
Total change	8.2	3.5	11.8
Within	1.7	2.6	4.1
Composition	6.6	1.0	7.7

	1992-2002	2002-2012	1992-2012
Honduras			
Total change	5.6	3.7	9.3
Within	4.1	0.9	5.3
Composition	1.5	2.7	3.9
Mexico			
Total change	14.9	9.0	23.9
Within	12.1	6.9	19.3
Composition	2.8	2.1	4.6
Nicaragua			
Total change	4.7	-2.4	2.3
Within	2.7	-5.1	-2.5
Composition	2.1	2.6	4.7
Panama			
Total change	8.9	9.1	18.0
Within	5.7	4.6	10.3
Composition	3.2	4.5	7.7
Paraguay			
Total change	3.4	5.3	8.7
Within	5.6	0.6	6.0
Composition	-1.6	4.7	3.2
Peru			
Total change	-0.5	6.3	5.8
Within	-0.9	5.9	4.8
Composition	0.4	0.3	1.0
Uruguay			
Total change	7.9	5.2	13.2
Within	3.4	3.1	6.6
Composition	4.5	2.1	6.6
Venezuela			
Total change	18.8	-0.6	18.1
Within	15.1	-5.5	8.4
Composition	3.7	4.9	9.7

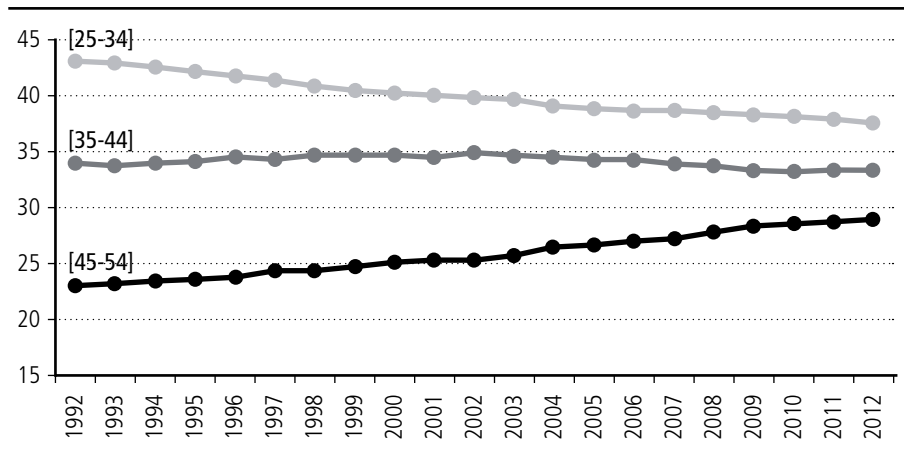
Source: own calculations based on microdata from national household surveys.

We should pause here to offer a word of caution regarding these interpretations. The decomposition suggests that, for some autonomous reason, there was an expansion in education in Latin America, and almost mechanically, a more educated pool of women implied a higher LFP. In this light, the results of the decompositions indicate, for instance, that the policies that were successful in fostering labor participation in the 2000s were mainly the education policies

that allowed for the expansion of schooling during the previous decades. Of course, the real world could be more complicated. It could be for instance that in the past the government encouraged employment in a sector that requires skilled labor intensively, and that the increased demand stimulated women to attend high school or college in order to get a job in that sector. In this case, it is the sector/employment policy what is triggering the reaction in the rest of the variables. In stressing the results of the decompositions, we implicitly assume that these more complicated channels are of a second order of importance. At least in the case of education, we do not believe this to be a strong assumption.

We now consider changes in the age structure of the population. A demographic transition is underway in Latin America, implying an aging process of the female population (Figure 4.3). While in the early 1990s 43.4% of that population was in the [25-34] age group, in the early 2010s that share fell to 37.7%. By contrast, the share in the older age bracket [45-54] climbed from 22.9% to 28.9% over the two decades.

Figure 4.3: Changes in composition of women by age groups Latin America. Women aged 25-54.



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

Note: unweighted means.

Younger women have a stronger attachment to the labor market than their older counterparts. The gaps, however, have been reduced over time, as women in their forties and fifties strongly increased their labor force participation over the last two decades (Table 4.6). On average, in 2012 LFP was 63% for women aged 45 to 54; 66% for those aged 25 to 34; and 68% for females aged 35 to 44.

Table 4.6: Female LFP by age Latin America. Women aged 25-54.

	Female LFP			Shares		
	1992	2002	2012	1992	2002	2012
25-34	53.7	62.2	65.9	43.4	39.8	37.7
35-44	56.4	64.9	67.9	33.7	34.8	33.4
45-54	47.9	58.5	63.0	22.9	25.4	28.9
Total	53.2	62.1	65.6	100.0	100.0	100.0

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

Note: unweighted means.

Given the lower labor market participation of older women, the demographic transition could have implied a decrease in the overall rate of female LFP. The results of the decomposition presented in Table 4.7 help to assess this hypothesis. As expected, the composition effect is negative: the aging of the female labor force is associated with a fall in participation. However, the size of the effect is small, just 0.1 points, and stable over time.

Table 4.7: Decomposition of changes in female LFP by age Latin America. Women aged 25-54.

	1992-2002	2002-2012	1992-2012
Difference	8.9	3.5	12.4
Effects			
Within	9.0	3.7	12.7
Composition	-0.1	-0.1	-0.3

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

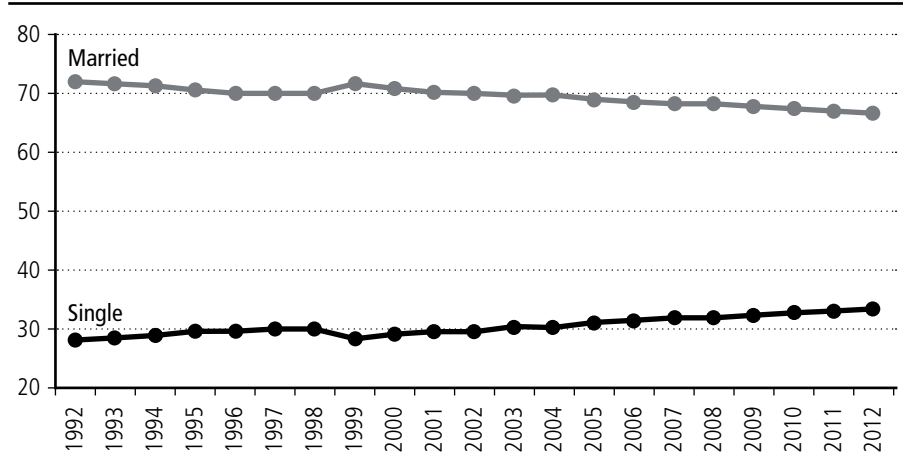
Note: unweighted means.

Marital status is a key covariate of female labor decisions. In particular, single women (in our definition, those not living with a spouse) are much more prone to work than married women, even when controlling for other observable factors. Unlike in other regions of the world where the fertility decline was accompanied by a sharp drop in the prevalence of marriages, the percentage of married women (both in legal and consensual unions) in Latin America has experienced only a slight decreasing trend, remaining relatively high over the years.³ On average,

3 For instance, Fussell and Palloni (2004) point out the presence of persistent marriage regimes in Latin America.

the share of single adult women increased from 27.9% in 1992 to 29.8% in 2002 and accelerated to 33.7% in 2012 (Figure 4.4). That pattern may be associated with increasing female LFP, given the higher LFP of single women (Table 4.8).

Figure 4.4: Changes in composition of women by marital status Latin America. Women aged 25-54.



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

Table 4.8: Female LFP by marital status Latin America. Women aged 25-54.

	Female LFP			Shares		
	1992	2002	2012	1992	2002	2012
Single	74.5	77.2	78.8	27.9	29.8	33.7
Married	47.1	54.7	58.7	72.1	70.2	66.3
Total	54.8	61.5	65.6	100.0	100.0	100.0

Source: own calculations based on microdata from national household surveys.
Note: unweighted means. Married women: both in legal and consensual unions.

That conjecture is confirmed in Table 4.9: the growth in the share of single women is associated with the increase in female LFP over these two decades. The impact was 0.4 points in the 1990s and 0.8 in the 2000s, when the pattern against marriage picked up. The contribution of the two groups to the change in the two effects was similar in sign, but different in size (Table 4.10). In fact, it is the change in behavior among married women what drives the marked contrast between the strong within effect in the 1990s and the milder effect in the 2000s.

Table 4.9: Decomposition of changes in female LFP by marital status Latin America. Women aged 25-54.

	1992-2002	2002-2012	1992-2012
Difference	8.5	4.3	11.2
Effects			
Within	8.1	3.5	9.7
Composition	0.4	0.8	1.5

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

Note: unweighted means.

Table 4.10: Within and composition effects by marital status Latin America. Women aged 25-54.

	Within			Composition		
	1992-2002	2002-2012	1992-2012	1992-2002	2002-2012	1992-2012
Single	1.0	0.2	1.3	1.4	3.2	4.5
Married	7.1	2.4	9.3	-1.0	-2.3	-3.1
Total	8.1	2.7	10.6	0.4	0.9	1.4

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

Note: unweighted means. Married women: both in legal and consensual unions.

Our next covariate is the number of children. There have been strong changes in fertility in Latin America; the share of adult women without children substantially rose from 17.6% in 1992 to 21.5% in 2002 and 27.2% in 2012 (Figure 4.5 and Table 4.11). Given that women with no children are more prone to participate than women with children, these changes in fertility may be associated with an increase in LFP.

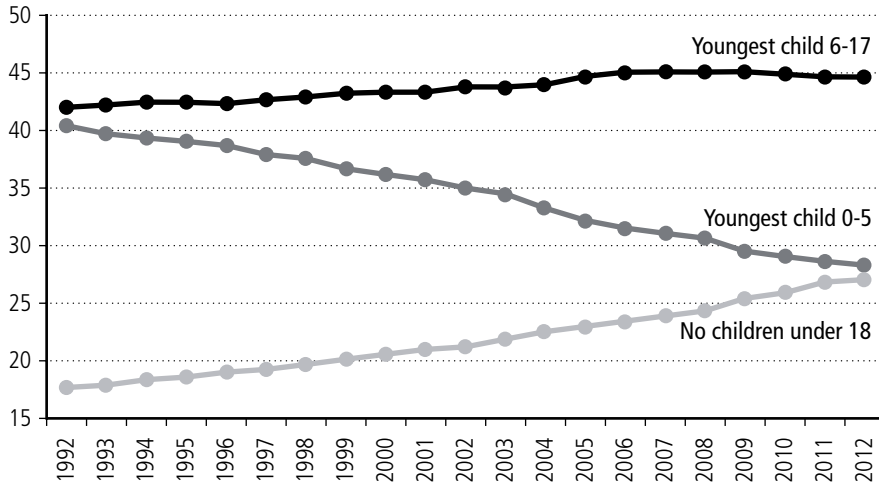
Table 4.11: Female LFP by number of children Latin America. Women aged 25-54.

	Female LFP			Shares		
	1992	2002	2012	1992	2002	2012
No children under 18	53.3	63.6	67.4	17.6	21.5	27.2
Youngest child is 0-5	45.4	53.6	56.6	40.6	34.8	28.2
Youngest child is 6-17	52.6	63.0	65.6	41.8	43.7	44.6
Total	49.8	59.8	63.5	100.0	100.0	100.0

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

Note: unweighted means.

Figure 4.5: Changes in composition of women by number of children Latin America. Women aged 25-54.



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

Note: unweighted means.

The results in Table 4.12 confirm this presumption, while making it clear that there is a difference in the relative relevance of this effect for the two decades under analysis. The fertility factor was smaller in the 1990s, especially as compared to the strong increase in LFP for each category of women. By contrast, in the 2000s the change in fertility patterns was stronger, while the within-group increases in LFP were weaker, combining for a more sizeable relative impact: around a fourth of the increase in the aggregate LFP rate in the region is accounted for by changes in fertility, mainly by the sharp increase in the share of adult women without children. Naturally, the link between fertility and labor decisions is strong, and the causal relationships may be intricate, so these results should be taken merely as a suggestion that fertility changes, for whatever reasons that they took place, may be one relevant determinant of changes in female LFP. We will return to these issues in the next chapters.

Two facts suggest that a decomposition by area (urban-rural) may be worthwhile. On the one hand, women living in urban areas tend to participate more in the labor markets than their rural counterparts (Table 4.13); on the other hand, the share of women living in cities has increased over the last two decades (Figure 4.6).

Table 4.12: Decomposition of changes in female LFP by number of children Latin America. Women aged 25-54.

	1992-2002	2002-2012	1992-2012
Difference	10.0	3.7	13.7
Effects			
Within	9.5	3.0	12.6
Composition	0.5	0.7	1.1

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

Note: unweighted means.

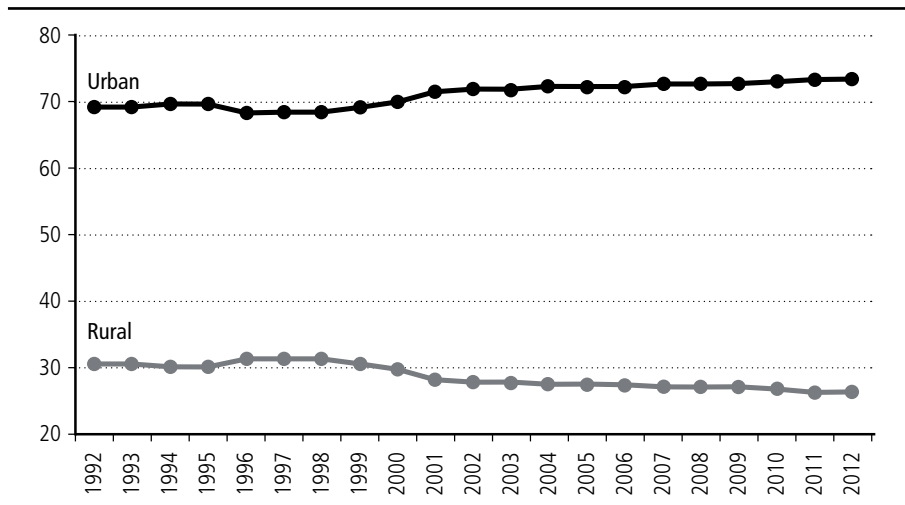
Table 4.13: Female LFP by area (urban-rural) Latin America. Women aged 25-54.

	Female LFP			Shares		
	1992	2002	2012	1992	2002	2012
Rural	42.2	50.8	53.0	36.0	34.0	28.2
Urban	57.2	65.0	67.7	64.0	66.0	71.8
Total	51.3	60.0	63.5	100.0	100.0	100.0

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

Note: unweighted means.

Figure 4.6: Changes in composition of women by area of residence Latin America. Women aged 25-54.



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

Note: unweighted means.

The interpretation of the decomposition is a bit trickier in this case. If, for instance, the increase in the share of urban population is only related to exogenous urban-rural differences in birth rates, then the result in Table 4.14 reflects a causal link. In this case, the spatial gap in population growth is responsible for 0.5 points in the increase in female LFP in the 1990s and 0.1 points in the 2000s. Rather, if the increase in the share of the urban population is mainly the result of inactive or unemployed people moving from rural areas to cities to seek employment, then the results are more difficult to interpret.

Table 4.14: Decomposition of changes in female LFP by area (urban-rural) Latin America. Women aged 25-54.

	1992-2002	2002-2012	1992-2012
Difference	7.7	3.9	11.6
Effects			
Within	7.2	3.8	10.9
Composition	0.5	0.1	0.7

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

Note: unweighted means.

To close this section, we divide the population of adult women into 18 groups formed by the intersection of three of the main determinants of female LFP identified above: marriage, education, and children (Table 4.15). For almost all groups, female LFP increases strongly in the 1990s and decelerates in the 2000s; in some cases, it even falls (the exception is the group of females with a college degree and no children).

Table 4.15: Female LFP by groups of education, marital status and children Latin America. Women aged 25-54.

			Female LFP			Shares		
			1992	2002	2012	1992	2002	2012
Low		No children under 18	41.9	53.0	54.7	9.5	9.6	10.4
		Youngest child is 0-5	37.5	44.3	45.3	27.9	21.9	14.1
		Youngest child is 6-17	44.8	54.6	56.2	26.5	25.0	21.9
Married	Medium	No children under 18	58.7	65.9	67.3	2.2	3.3	4.8
		Youngest child is 0-5	54.6	61.2	59.3	7.0	6.6	7.3
		Youngest child is 6-17	60.5	64.7	66.2	5.6	7.4	8.9
High		No children under 18	75.4	82.1	89.3	1.0	1.8	3.1
		Youngest child is 0-5	77.8	81.8	81.1	2.5	3.1	3.8
		Youngest child is 6-17	80.3	85.3	86.1	2.2	3.1	4.3

			Female LFP			Shares		
			1992	2002	2012	1992	2002	2012
Single	Low	No children under 18	69.0	71.6	73.9	3.5	3.7	4.2
		Youngest child is 0-5	75.5	78.6	75.5	2.7	2.5	2.0
		Youngest child is 6-17	76.3	81.2	81.7	5.7	5.9	5.9
	Medium	No children under 18	81.2	84.2	86.8	1.0	1.6	2.4
		Youngest child is 0-5	89.3	87.0	83.5	0.6	0.6	1.0
		Youngest child is 6-17	85.3	90.5	86.9	1.0	1.7	2.5
	High	No children under 18	95.0	91.9	93.4	0.6	1.1	1.8
		Youngest child is 0-5	95.5	94.7	96.3	0.2	0.2	0.4
		Youngest child is 6-17	92.7	96.0	94.6	0.5	0.8	1.2
Total			50.5	60.5	64.6	100.0	100.0	100.0

Source: own calculations based on microdata from national household surveys.
 Note: unweighted means. Married women: both in legal and consensual unions.
 Education: low=less than secondary complete, medium=secondary complete and superior incomplete, high=tertiary complete.

The results of the decomposition using this grouping confirm the contrast between a strong within effect that dominates the changes in female LFP in the 1990s, and a milder effect in the 2000s that becomes dominated by the composition effect (Table 4.16). It should be noted that most of the composition effect comes from changes in the educational structure of the female population.

Table 4.16: Decomposition of changes in female LFP by groups of education, marital status and children Latin America. Women aged 25-54.

	1992-2002	2002-2012	1992-2012
Difference	10.0	4.0	14.0
Effects			
Within	7.2	1.1	8.1
Composition	2.8	2.9	5.9

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

4. Exploring changes in employment

As discussed in the introduction, a change in the structure of employment may foster female labor force participation. Autonomous expansions in sectors or tasks

more friendly to female employment may lead to a surge in the aggregate rate of female LFP even with unchanged propensity to employ women within jobs.

Implementing the same decomposition as in the previous sections is unfeasible, since unlike education, age, or marital status, job characteristics are only defined for employed women. Instead, we carry out a decomposition that accounts for changes in the share of women in total employment. As discussed in chapter 3, the strong entry of women into the labor force was translated into a substantial increase in the participation of females in total employment. When the sample was restricted to workers aged 25 to 54, the proportion of women increased strongly from 36.5% in 1992 to 40.5% in 2002, and then more slowly to 42.4% in 2012.

This change may be driven by two forces. On the one hand, the female-to-male ratio may be increasing in all sectors. On the other hand, the distribution of jobs may be shifting toward those with a higher female-to-male ratio. Formally, the change in the share of female workers in total employment can be written as:

$$\Delta\left(\frac{E_f}{E}\right) = \sum_s \frac{E_{st+1}}{E_{t+1}} \Delta\left(\frac{E_{fs}}{E_s}\right) + \sum_s \frac{E_{fst}}{E_{st}} \Delta\left(\frac{E_s}{E}\right)$$

where E is the number of people employed, f stands for women, t is time, s labels the economic sector, and Δ stands for changes between time t and $t+1$. Hence, for instance, E_{fst} is the total number of women employed in sector s at time t . The first term in the decomposition captures the impact of changes in the propensity to employ women within sectors (the *within effect*), while the second one captures the impact of changes in the structure of employment across sectors (the *composition effect*).

We first implement this decomposition by dividing workers according to their main jobs into 10 economic sectors: primary activities, low-tech industry (food, clothing), rest of industries, construction, commerce, utilities and transportation, skilled services (finance, business services), public administration, education and health, and domestic services.

Table 4.17 reflects an increasing share of women in all sectors over time. The pace of that increase was heterogeneous over time. In particular, on average it was a bit slower in the 2000s as compared to the previous decade. That deceleration was particularly evident for more unskilled sectors, including primary activities, low-tech industries, commerce, and domestic services.

**Table 4.17: Share of women in each sector and employment structure by sector
Latin America. Workers aged 25-54.**

Sector	Share of women in employment			Sectoral structure		
	1992	2002	2012	1992	2002	2012
Primary activities	16.3	20.3	22.8	17.3	16.9	14.6
Food & clothing	47.5	51.0	49.0	9.4	8.3	7.6
Rest of manufacturing	18.5	20.0	21.9	6.7	5.5	4.8
Construction	2.6	3.3	4.3	7.0	6.8	7.7
Commerce	46.3	50.7	53.4	22.7	23.8	24.7
Utilities & transportation	10.6	11.4	13.3	7.3	6.9	7.4
Skilled services	33.8	36.3	40.5	4.7	5.9	7.4
Public administration	29.8	34.9	40.5	6.3	5.9	6.6
Education & health	60.8	62.8	65.3	14.3	15.0	14.2
Domestic services	87.6	91.2	93.0	4.5	5.0	4.9
Total	36.7	40.5	42.7	100.0	100.0	100.0

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

Note: the first panel shows the participation of female workers in total employment by sector, while the second panel presents the sectoral structure of employment for all workers. Unweighted means.

The structure of employment experienced some changes over time (second panel in Table 4.17). While the share of employment in primary activities and the manufacturing industry continued a decreasing path initiated decades ago, some sectors gained participation. Interestingly, while education and health, and domestic services—two sectors with a high female-to-male ratio—expanded during the 1990s, in the 2000s construction, utilities and transportation, and public administration—three sectors with lower than average female-to-male ratios—expanded.

The results of the decompositions capture these patterns (Table 4.18). While the composition effect was positive in the 1990s (*i.e.* it helped the increase in the female share in total employment), it became negative, although virtually null in the 2000s.⁴ This piece of evidence adds another possible explanation to the deceleration in the growth in female LFP in the 2000s. The change in the structure of employment may have benefited less the entry of women into the labor market, as compared to changes in the previous decade. The evidence suggests however that this effect has probably been small.

⁴ The within effect is positive in both decades, although somewhat higher in the 1990s.

**Table 4.18: Decomposition of changes in share of women in employment by sector of activity
Latin America. Adults aged 25-54.**

	1992-2002	2002-2012	1992-2012
Difference	3.8	2.2	6.1
Effects			
Within	2.9	2.5	5.3
Composition	0.9	-0.2	0.9

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

Note: unweighted means.

Naturally, relevant changes in production and employment can also occur without changes in the sectoral structure of the economy. Technological innovations, for instance, can transform the demand for tasks performed by workers within sectors and across the economy. New production processes that require more women-friendly tasks would imply a boost to female employment.

The fact that tasks are not usually coded in Latin American household surveys makes the analysis at the regional level more difficult. Here we just illustrate some results for two countries, Brazil and Chile, during the 2000s. The results, however, are illustrative: the share of women increased in most task categories in both countries, while the structure of employment slowly shifted towards tasks in which women are over-represented (Table 4.19). The decompositions capture these changes: the within effect is positive, but it becomes very small at the end of the decade, while the composition effect is positive and significant in size (Table 4.20).

**Table 4.19: Share of women in each task and employment structure by task
Brazil and Chile. Women aged 25-54.**

Task	Brazil					
	Share of women in employment			Tasks structure		
	1999	2004	2009	1999	2004	2009
Managers	30.0	34.7	36.5	6.3	6.1	6.0
Professionals	52.1	60.8	62.5	5.3	7.4	9.0
Technicians and associate professionals	51.2	47.8	45.4	6.9	8.0	8.0
Clerical support workers	58.3	59.9	61.7	7.6	7.7	8.6
Service and sales workers	61.6	63.4	64.9	30.6	30.7	30.6
Skilled agricultural, forestry and fishery workers	37.2	34.4	32.6	18.4	15.5	13.0
Craft and related trades workers	16.2	16.6	15.7	20.9	20.3	20.2
Plant and machine operators, and assemblers	31.6	29.5	29.3	2.3	2.2	2.3
Elementary occupations	0.9	1.8	1.7	1.7	2.1	2.2
Total	42.4	43.9	44.8	100.0	100.0	100.0

Chile						
Task	Share of women in employment			Tasks structure		
	2000	2003	2009	2000	2003	2009
Managers	37.4	46.2	36.4	5.8	5.6	2.5
Professionals	50.9	49.0	53.9	11.6	11.7	13.0
Technicians and associate professionals	55.0	55.6	52.4	11.0	11.5	12.0
Clerical support workers	42.9	41.0	54.6	5.8	6.1	5.8
Service and sales workers	58.0	57.0	54.7	13.7	13.2	17.2
Skilled agricultural, forestry and fishery workers	12.4	12.4	13.0	6.9	6.3	3.8
Craft and related trades workers	13.5	13.2	13.0	14.8	15.9	13.9
Plant and machine operators, and assemblers	7.8	8.5	8.9	9.7	9.7	9.3
Elementary occupations	44.0	48.6	48.1	20.7	20.1	22.6
Total	37.3	38.2	40.8	100.0	100.0	100.0

Source: own calculations based on microdata from PNAD and CASEN.

Note: the first panel shows the participation of female workers in total employment by task, while the second panel presents the structure of employment.

**Table 4.20: Decomposition of changes in share of women in employment by task
Brazil and Chile. Women aged 25-54.**

Brazil			
	1999-2004	2004-2009	1999-2009
Difference	1.5	0.9	2.3
Effects			
Within	0.9	0.2	1.2
Composition	0.6	0.6	1.2

Chile			
	2000-2003	2003-2009	2000-2009
Difference	0.9	2.6	3.5
Effects			
Within	1.1	0.2	1.2
Composition	-0.1	2.3	2.3

Source: own calculations based on microdata from PNAD and CASEN.

5. Concluding remarks

This chapter proposes some simple decompositions as a way to assess whether changes in the distribution of some variables may have affected the rates of female labor force participation in Latin America over the last two decades. We conclude that changes in education, marriage, fertility, and location all favored a more intense labor market involvement among women. Women now are more educated, have fewer children and are more likely to be single than they were two decades ago. In this scenario, even with the same conditional propensity to participate, the overall female LFP should increase.

The contribution of these factors to the observed increase in female LFP in the 1990s was significant but not dominant; rather, the role played in the 2000s seems to have been decisive. Without the changes in the structure of the female population (in particular, in terms of education), the deceleration in female LFP growth in Latin America in the 2000s documented in the last chapter would have probably been more marked.

There is also some evidence that suggests that changes in the structure of employment toward tasks more frequently performed by women may have also contributed to the increase in labor force participation. Instead, changes in the sectoral structure of the economy may have operated in the direction of the observed deceleration in female LFP, although that impact was probably rather small.

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Appendix

Figure 4.1: Predicted probability of participating in labor force Latin American countries. Women aged 25 to 54

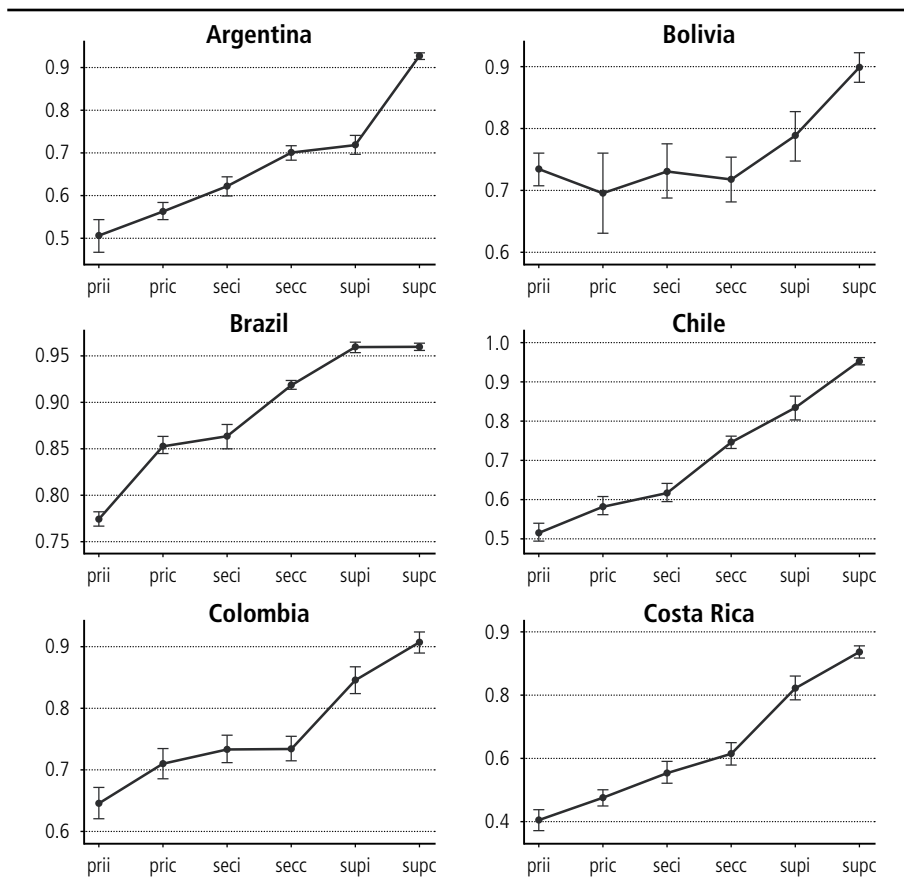


Figure 4.1: Predicted probability of participating in labor force [cont.]

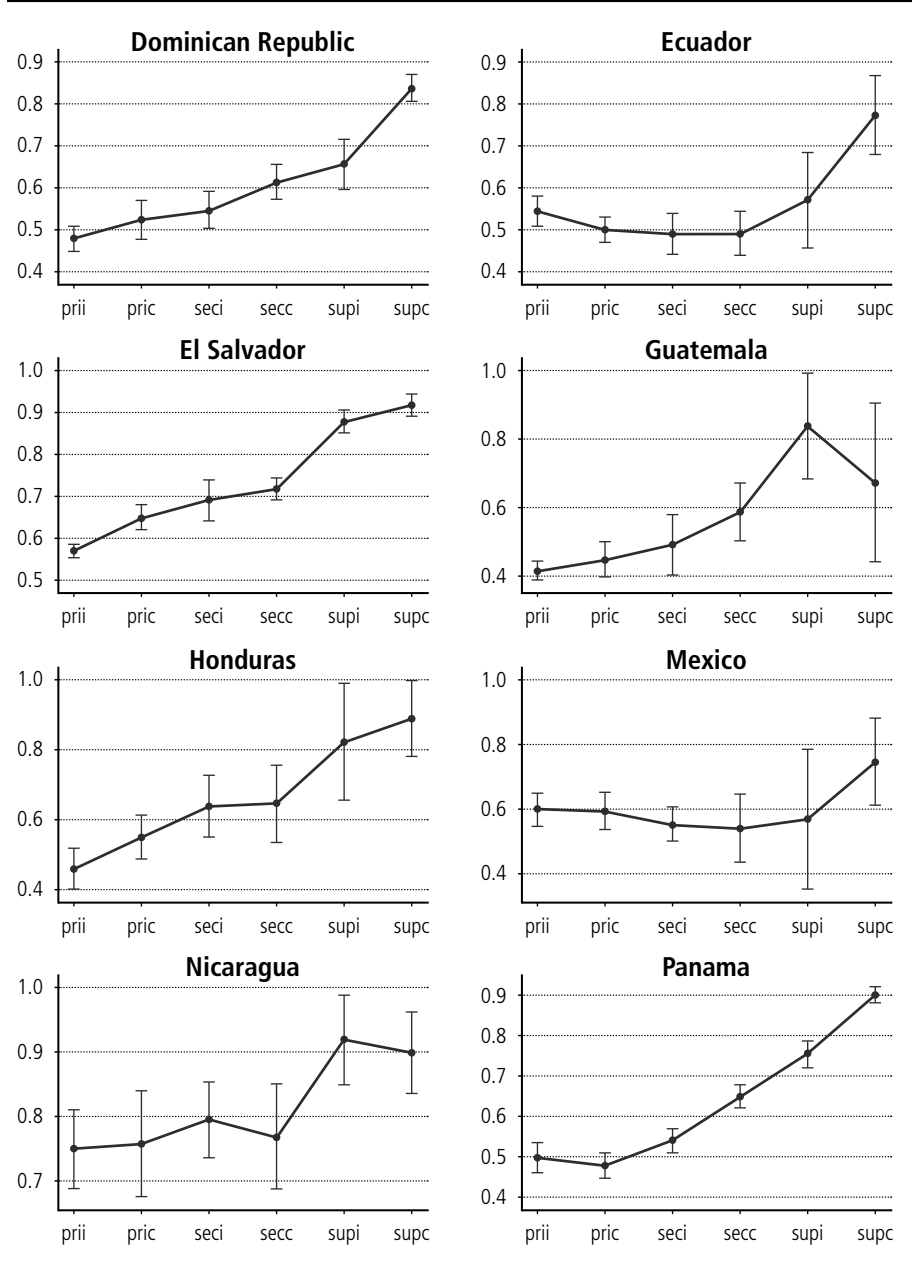
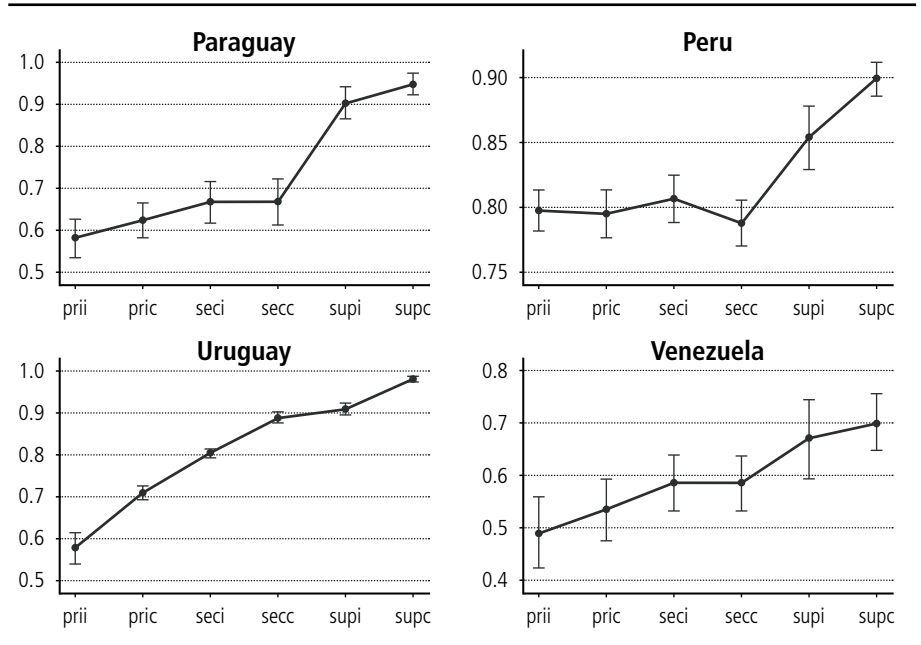


Figure 4.1: Predicted probability of participating in labor force [cont.]



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

Note: Educational levels: prii: incomplete primary; pric: complete primary; seci: incomplete secondary; secc: complete secondary; supi: incomplete tertiary; supc: complete tertiary. Observations for year 2012 or closest year with available survey.

**Table 4.1: Probit models of labor force participation
Marginal effects. Women aged 25-54.**

	Argentina	Bolivia	Brazil	Chile	Colombia	Costa Rica	Dom. Rep.	Ecuador	El Salvador	Guatemala	Honduras	Mexico	Nicaragua	Panama	Paraguay	Peru	Uruguay	Venezuela
Married/ Cohabiting	-0.2736*** (0.007)	-0.2488*** (0.008)	-0.1552*** (0.008)	-0.2089*** (0.008)	-0.2274*** (0.009)	-0.3559*** (0.014)	-0.1583*** (0.019)	-0.3483*** (0.019)	-0.2970*** (0.011)	-0.3426*** (0.021)	-0.1868*** (0.032)	-0.2297*** (0.033)	-0.0495 (0.033)	-0.2421*** (0.014)	-0.1948*** (0.024)	-0.1615*** (0.008)	-0.1283*** (0.006)	-0.1405*** (0.023)
Primary Complete	0.0498** (0.017)	-0.0380 (0.033)	0.0514** (0.011)	0.0575*** (0.012)	0.0585*** (0.014)	0.0713*** (0.019)	0.0443** (0.025)	-0.0445** (0.025)	0.0796*** (0.015)	0.0958*** (0.026)	0.0898** (0.036)	-0.0047 (0.034)	0.0083 (0.044)	-0.0193 (0.021)	0.0395 (0.026)	-0.0026 (0.011)	0.0800*** (0.010)	0.0431 (0.040)
Secondary Incomplete	0.0961*** (0.016)	-0.0024 (0.023)	0.0848*** (0.014)	0.0847*** (0.012)	0.0814*** (0.013)	0.1479*** (0.021)	0.0679*** (0.024)	-0.0539* (0.029)	0.1196*** (0.025)	0.0771* (0.045)	0.1774*** (0.051)	-0.0472 (0.033)	0.0449 (0.036)	0.0405* (0.021)	0.0794*** (0.027)	0.0088 (0.011)	0.1548*** (0.011)	0.0938** (0.039)
Secondary Complete	0.1653*** (0.015)	-0.0152 (0.009)	0.1299*** (0.009)	0.1995*** (0.010)	0.0828*** (0.013)	0.2032*** (0.021)	0.1332** (0.023)	-0.0515* (0.023)	0.1485*** (0.031)	0.1744*** (0.043)	0.1863*** (0.060)	-0.0582 (0.058)	0.0189 (0.045)	0.1440*** (0.020)	0.0801*** (0.030)	-0.0094 (0.011)	0.1685*** (0.006)	0.0935** (0.039)
Superior Incomplete	0.1711*** (0.014)	0.0935** (0.022)	0.2416*** (0.013)	0.2350*** (0.011)	0.1836*** (0.012)	0.3773*** (0.018)	0.1726*** (0.031)	0.0256 (0.061)	0.3086*** (0.015)	0.4261*** (0.080)	0.3614*** (0.087)	-0.0312 (0.114)	0.1680*** (0.039)	0.2365*** (0.020)	0.2940*** (0.020)	0.0569*** (0.014)	0.1711*** (0.005)	0.1760*** (0.046)
Superior Complete	0.3809*** (0.010)	0.1770*** (0.016)	0.2528*** (0.012)	0.3813*** (0.007)	0.2453*** (0.010)	0.4868*** (0.011)	0.3576*** (0.019)	0.2404*** (0.054)	0.3478*** (0.014)	0.2596** (0.119)	0.4314*** (0.059)	0.1550** (0.078)	0.1499*** (0.038)	0.3831*** (0.014)	0.3435*** (0.016)	0.1081*** (0.010)	0.2520*** (0.005)	0.2105*** (0.038)
Youngest child is 0-5	-0.1425*** (0.012)	-0.0622*** (0.023)	-0.0330*** (0.012)	-0.0863*** (0.015)	0.0198 (0.015)	-0.2094*** (0.021)	-0.0676*** (0.026)	0.0051 (0.029)	-0.0954*** (0.017)	-0.0861** (0.039)	-0.1184** (0.052)	-0.0509 (0.047)	-0.0283 (0.051)	-0.0761*** (0.021)	-0.0774** (0.034)	-0.0536*** (0.013)	-0.1096*** (0.010)	-0.0151 (0.040)
Youngest child is 6-17	-0.0605*** (0.010)	0.0228 (0.020)	0.0858*** (0.010)	0.0080 (0.012)	0.0935*** (0.013)	-0.0913*** (0.017)	0.0291 (0.020)	0.0493** (0.023)	0.0181 (0.013)	0.0463 (0.036)	-0.0572 (0.043)	0.0375 (0.038)	0.0331 (0.036)	-0.0300* (0.017)	0.0208 (0.028)	0.0223** (0.010)	0.0077 (0.007)	-0.0227*** (0.029)
Age	0.0458*** (0.005)	0.0334** (0.008)	0.0391*** (0.004)	0.0451*** (0.005)	0.0505*** (0.006)	0.0473*** (0.009)	0.0481*** (0.010)	0.0334*** (0.011)	0.0592*** (0.006)	0.0272** (0.011)	0.0770*** (0.019)	0.0380** (0.017)	0.0327* (0.018)	0.0371*** (0.008)	0.0491*** (0.013)	0.0296*** (0.005)	0.0226** (0.004)	0.0721*** (0.015)
Age Squared	-0.0006*** (0.000)	-0.0004*** (0.000)	-0.0005*** (0.000)	-0.0006*** (0.000)	-0.0006*** (0.000)	-0.0007*** (0.000)	-0.0006*** (0.000)	-0.0004*** (0.000)	-0.0008*** (0.000)	-0.0003*** (0.000)	-0.0010*** (0.000)	-0.0005** (0.000)	-0.0004** (0.000)	-0.0004*** (0.000)	-0.0006*** (0.000)	-0.0004*** (0.000)	-0.0003*** (0.000)	-0.0010*** (0.000)
Urban	-0.0233 (0.016)	-0.1083*** (0.008)	-0.0940*** (0.011)	-0.0002*** (0.016)	-0.0001*** (0.016)	0.1064*** (0.014)	0.0683** (0.017)	0.0073 (0.019)	0.1558*** (0.010)	0.0963*** (0.020)	0.0785** (0.034)	-0.0319 (0.028)	0.1386*** (0.043)	0.0134 (0.014)	0.0480** (0.008)	-0.0480*** (0.008)	0.0014 (0.008)	-0.0929*** (0.011)
Non-earned income	-0.0799*** (0.004)	-0.0420*** (0.009)	-0.0940*** (0.006)	-0.0002*** (0.000)	-0.0001*** (0.000)	-0.0009*** (0.000)	-0.0086*** (0.001)	-0.0382 (0.070)	-0.9930*** (0.048)	-0.0326*** (0.011)	-0.0244*** (0.005)	-0.0152*** (0.004)	-0.0139*** (0.003)	-0.0285* (0.016)	-0.0001*** (0.000)	-0.0667*** (0.011)	-0.0008*** (0.000)	-0.0051 (0.004)
Other Family income	-0.0050*** (0.001)	-0.0082*** (0.002)	0.0093*** (0.002)	0.0000*** (0.000)	-0.0000*** (0.000)	-0.0000*** (0.000)	-0.0004*** (0.001)	-0.0565*** (0.021)	-0.0799*** (0.013)	0.0072 (0.002)	-0.0018 (0.001)	-0.0028 (0.002)	-0.0008 (0.002)	-0.0145*** (0.006)	-0.0000*** (0.000)	-0.0072*** (0.002)	-0.0014*** (0.000)	-0.0146*** (0.004)
Observations	17,317	4,729	21,688	15,166	10,934	6,822	4,392	3,986	11,860	3,842	1,182	1,612	938	6,811	2,618	13,980	20,363	2,142
Pseudo R-squared	0.1620	0.0873	0.0544	0.1750	0.1043	0.1696	0.0751	0.0808	0.1263	0.0889	0.0887	0.0410	0.0582	0.1167	0.0900	0.0496	0.1217	0.0816

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

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10. Observations for year 2012 or closest year with available survey.