Juan Carlos Campaña Naranjo

Self-Employment, employment, and time-allocation decisions: social norms, the work-life-family balance, and collective labor supply

Tesis Doctora

SELF-EMPLOYMENT, EMPLOYMENT, AND TIME-ALLOCATION DECISIONS: SOCIAL NORMS, THE WORK-LIFE-FAMILY BALANCE, AND COLLECTIVE LABOR SUPPLY

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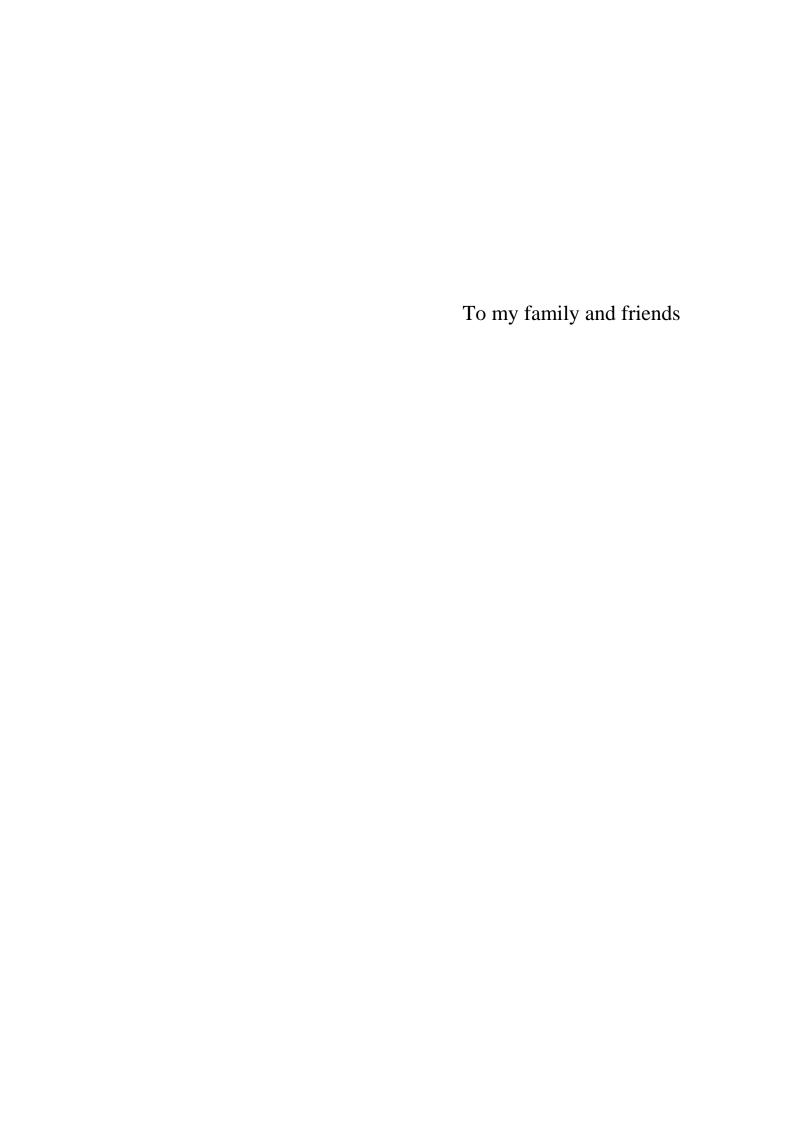Economic Analysis Department
University of Zaragoza

THESIS

Self-employment, employment, and time-allocation decisions: social norms, the work-life-family balance, and collective labor supply

TESIS

Autoempleo, trabajo asalariado y asignación de tiempo: normas sociales, equilibrio trabajo-familia y oferta de trabajo colectiva

Thesis Supervisors: José Ignacio Giménez Nadal
José Alberto Molina Chueca

Juan Carlos Campaña Naranjo
Zaragoza
June 2018

To my family and friends

Resumen

Esta Tesis Doctoral adopta un enfoque microeconómico para estudiar las decisiones de asignación de tiempo de auto-empleados y asalariados de países latinoamericanos. Comprender cómo los individuos asignan su tiempo es importante, dado que las diferencias detectadas respecto a cómo las personas distribuyen su tiempo en trabajo remunerado y no remunerado tienen implicaciones en su bienestar diario. En primer lugar, en el Capítulo I analizamos el papel que desempeñan las normas sociales en el tiempo dedicado al trabajo total por parte de hombres y mujeres latinoamericanos, encontrando diferencias relevantes por género entre países. Los resultados obtenidos muestran que las diferencias entre países según sus respectivas normas sociales pueden explicar parcialmente la brecha de género en el trabajo total. En segundo lugar, en el Capítulo 2 estudiamos específicamente cómo las mujeres trabajadoras, divididas entre auto-empleadas y asalariadas, asignan su tiempo a tres categorías específicas: trabajo remunerado, tareas domésticas y cuidado de niños. Encontramos que las madres auto-empleadas dedican menos tiempo al trabajo remunerado y más tiempo al trabajo no remunerado y al cuidado de niños en comparación con las madres asalariadas. Nuestros resultados muestran al auto-empleo como una opción positiva para combinar el trabajo remunerado con las responsabilidades domésticas y el cuidado de los niños. Finalmente, en el Capítulo III adoptamos un enfoque familiar colectivo para conocer y analizar qué factores influyen en la oferta de trabajo de hombres y mujeres en países latinoamericanos, asumiendo que, en términos de políticas públicas, es necesario comprender cómo las actividades laborales se comparten en el hogar entre sus miembros sobre la base de un proceso negociador.

Abstract

This Doctoral dissertation adopts a micro-economic approach to study the time allocation decisions of self-employed and employed workers of Latin American countries. Understanding how individuals allocate their time is important, given that the differences observed in how people spend their time in paid and unpaid work have implications for their daily well-being. In Chapter I, we analyze the role played by social norms in the time devoted to total work by Latin American men and women, finding significant differences by gender between countries. The results obtained show that the differences between countries according to their respective social norms can partially explain the gender gap in total work. In Chapter 2, we specifically study how working mothers, divided into self-employed and employed workers, allocate their time to three specific categories: paid work, unpaid work, and child care. We find that self-employed mothers devote less time to paid work and more time to unpaid work and child care, compared to employed mothers. Our results show self-employment as a positive option to combine paid work with domestic responsibilities and child care. In Chapter III, we adopt a collective family approach to understand and analyze what factors influence the labor supply of men and women in Latin American countries, assuming that, in terms of public policy, it is necessary to understand how labor activities are shared in the home among its members on the basis of a negotiating process.

Contents

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Introducción en español

La presente Tesis Doctoral adopta un enfoque microeconómico para estudiar las decisiones de asignación de tiempo de auto-empleados y asalariados de países latinoamericanos. Con este fin, desarrollamos tres líneas de investigación. La primera línea de investigación se centra en conocer cómo influyen las normas sociales en el reparto del trabajo total entre hombres y mujeres. La segunda línea de investigación analiza las diferencias en el tiempo dedicado por madres auto-empleadas y asalariadas al trabajo remunerado, trabajo no remunerado y el cuidado de niños. La tercera línea de investigación analiza desde un enfoque colectivo, a diferencia de las aproximaciones unitarias/individuales de los capítulos I y II, los factores que pueden influir en la oferta de trabajo de los miembros del hogar entre los cuales se produce una negociación.

Antes de comenzar con el Capítulo I, partimos de los resultados de Campaña et al. (2016), quienes, para el caso específico de Aragón - España, comparan dos periodos de tiempo (el primero de bonanza y el segundo de crisis económica) y encuentran para esta Comunidad Autónoma diferencias en los dos periodos analizados.[1] En el primer periodo de tiempo analizado, los autores encuentran que las mujeres auto-empleadas, en comparación con sus homologas asalariadas, dedican menos tiempo al trabajo remunerado y más tiempo al trabajo no remunerado y al cuidado de los niños, pero en el segundo periodo de tiempo las mujeres auto-empleadas, en comparación con las asalariadas, dedican más tiempo al trabajo remunerado y al trabajo no remunerado y dedican menos tiempo al cuidado de los niños. Una plausible justificación para estos resultados es que la crisis económica en España ha golpeado en términos de ocupación más a los hombres que a las mujeres (Castro y Santero 2014) por lo que muchas auto-

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[1] Una justificación para el análisis de la Comunidad Autónoma de Aragón aparece en Madrona-Pérez (2014), quien muestra los atractivos de Aragón y señala que ventajas como su privilegiada situación geográfica, la calidad de su capital humano y sus elevados niveles de infraestructuras de comunicaciones multimodales ha permitido que firmas líderes hayan apostado por invertir en esta comunidad. En este sentido, las inversiones exteriores en Aragón registraron un incremento del 25.5% comparando los periodos (1994-2003) y (2004-2013). El informe "Ciudades y Regiones Europeas del Futuro (fDi) 2014-2015" señala a la Comunidad Autónoma de Aragón como la tercera región más atractiva de España para invertir y la sexta del sur de Europa. Madrona-Pérez y Villanueva Sánchez (2015), analizando el periodo (2003-2015), muestran que la población activa en Aragón ha crecido con mucha mayor intensidad que la ocupación, como consecuencia el número de parados en el segundo trimestre de 2015 en Aragón es más del triple comparado con los parados del primer trimestre de 2003. En este contexto respecto a la dificultad de encontrar trabajo, el auto-empleo podría plantearse como alternativa principalmente para el desempleo de largar duración, de tal forma que aportar evidencia de este grupo de trabajadores es importante en términos de políticas públicas.

empleadas se verían en la obligación de aportar una mayor cantidad de ingresos en el hogar, dedicando más horas al día al trabajo remunerado. En este sentido, los autores sostienen que, en términos de políticas públicas, es necesario dar más apoyo a las auto-empleadas, por ejemplo, en servicios de guardería para sus hijos.

En el Capítulo I, estudiamos, desde una aproximación teórica unitaria, el papel que desempeñan las normas sociales en el tiempo dedicado al trabajo total (suma del trabajo remunerado y no remunerado) por hombres y mujeres en tres países latinoamericanos. Investigaciones previas muestran que, independientemente de las características particulares de los países, las mujeres dedican, en comparación con los hombres, más tiempo a la producción doméstica (Gershuny, 2000; Fisher y Robinson, 2011; Canelas y Salazar, 2014). Considerando, asimismo, una mayor incorporación de las mujeres al mercado de trabajo (CEPAL, 2014; World Bank, 2017), se produce el efecto de que en muchos países las mujeres dedican más tiempo al trabajo total en comparación con los varones (Giménez-Nadal y Sevilla 2012; Burda et al., 2013). Estos patrones nos llevan a considerar la posible existencia de "normas sociales", que pueden alentar una distribución desigual del tiempo total de trabajo entre hombres y mujeres (Burda et al., 2013).

Analizando los datos de las encuestas de uso del tiempo de México (2009), Perú (2010) y Ecuador (2012) observamos diferencias entre países en cuanto a la distribución de género en el trabajo total, siendo las mujeres las que dedican más tiempo a esta actividad en comparación con los hombres. Encontramos específicamente que Perú, en comparación con México y Ecuador, es el país con una distribución de género más igualitaria en el trabajo total. A partir de esta evidencia, y con el fin de medir el efecto de las normas sociales en la distribución del trabajo total entre géneros, utilizamos datos de la Encuesta Mundial de Valores (WVS) para crear un índice que mida la existencia de normas sociales de género en los países. Obtenemos en nuestros resultados econométricos que, al incluir un índice de normas de género, las diferencias entre hombres y mujeres en el tiempo dedicado al trabajo total se reducen. Asimismo, analizamos el comportamiento diferenciado según si los trabajadores son auto-empleados o asalariados y encontramos que las auto-empleadas y las asalariadas dedican más tiempo al trabajo total en comparación de los auto-empleados y asalariados, respectivamente; siendo la diferencia en el tiempo dedicado al trabajo total mayor en el caso de las auto-empleadas al comparar con los auto-empleados. Es importante indicar que, tanto en las comparaciones entre

hombres y mujeres trabajadores auto-empleados como asalariados, la inclusión del índice de normas de género reduce las diferencias entre hombres y mujeres respecto al tiempo dedicado al trabajo total. Contribuimos a la literatura económica identificando cómo las normas sociales afectan la distribución de género en el trabajo total, aportando evidencia para un grupo de países donde este tema puede ser de especial relevancia para el análisis de pobreza y bienestar de sus individuos.

En el Capítulo II, utilizando también la clásica y habitual aproximación unitaria, estudiamos las diferencias en el tiempo dedicado por las madres auto-empleadas y asalariadas al trabajo remunerado, al trabajo no remunerado y al cuidado de los niños en países latinoamericanos. Es importante realizar comparaciones en estos dos grupos ya que la evidencia previa en países desarrollados muestra que las madres auto-empleadas presentan un comportamiento diferencial con respecto al tiempo de cuidado de niños, en comparación con sus homólogas asalariadas, observándose que las auto-empleadas son las que dedican más tiempo a esta actividad (Giménez-Nadal et al., 2012; Johansson-Sevä y Öun, 2015).

Partiendo de esta evidencia en el que se muestran comportamientos diferentes en el uso del tiempo entre auto-empleadas y asalariadas, utilizamos los datos de las encuestas de uso del tiempo de México (2009), Perú (2010), Ecuador (2012) y Colombia (2012) para nuestros análisis de países latinoamericanos. En nuestros resultados econométricos encontramos en los cuatro países que las madres auto-empleadas dedican menos tiempo al trabajo remunerado y dedican más tiempo al trabajo no remunerado y cuidado de niños, en comparación de las madres asalariadas. Asumiendo que las madres auto-empleadas dedican más tiempo al cuidado de niños en comparación con las madres asalariadas, dividimos el cuidado de niños en dos categorías: el cuidado no educativo (por ejemplo, dar de comer, bañar a los niños) y el cuidado educativo (por ejemplo, ayudar con los deberes, leer cuentos a los niños). El interés principal de esta división es enfatizar aquellas actividades dirigidas a incrementar el capital humano de los niños que se encuentran enmarcadas dentro del cuidado educativo infantil. Nuestros resultados muestran que las madres auto-empleadas de México, Ecuador y Colombia dedican más tiempo al cuidado educativo infantil en comparación con las madres asalariadas. Además, encontramos diferencias en el tiempo dedicado al cuidado de los hijos entre las madres auto-empleadas y asalariadas según distintos niveles de educación.

Contribuimos a la literatura económica mostrando los beneficios del auto-empleo en estos países, como un medio de combinar el trabajo remunerado con el cuidado educativo de los niños. El hecho de que muchas madres auto-empleadas dediquen más tiempo al cuidado educativo de sus hijos en comparación con las madres asalariadas tiene implicaciones importantes, ya que el capital humano de los niños es un factor fundamental para sus resultados presentes y futuros.

En la tercera línea de investigación, en el Capítulo III, adoptamos un enfoque teórico colectivo para conocer y analizar qué factores puede influir en una participación eficiente de hombres y mujeres en el mercado de trabajo en países latinoamericanos. El enfoque colectivo ha sido comúnmente utilizado para analizar decisiones de asignación de tiempo dentro de los hogares, lo cual no era posible con el enfoque unitario, pero su evidencia se ha centrado en los países desarrollados (Vermeulen, 2002; Donni and Chiappori, 2011; Chiappori and Mazzocco, 2018; Donni and Molina, 2018). De acuerdo con este enfoque, el acuerdo intrafamiliar se alcanza a través de la llamada regla de reparto, después de asumir que las decisiones intrafamiliares son Pareto-eficientes.[2]

Para nuestro análisis de países latinoamericanos utilizamos los datos de las encuestas de uso del tiempo de México (2009) y Colombia (2012) para estimar el modelo colectivo de oferta de trabajo propuesto por Chiappori et al., (2002). Como principales resultados econométricos mostramos evidencia de que las decisiones de oferta de mano de obra son Pareto-eficiente dentro de estos hogares, ya que la racionalidad colectiva no es rechazada en los dos países. Encontramos que los salarios más altos de las mujeres influyen a que las mismas dediquen más horas al mercado de trabajo, y que los hombres muestran un comportamiento altruista hacia las mujeres con el aumento de sus ingresos laborales.

En cuanto a los factores de distribución, encontramos que el índice de masculinidad (sex-ratio) está relacionado con las transferencias de ingresos adicionales de los hombres hacia las mujeres en Colombia, lo que arroja luz sobre la relevancia de los factores de distribución en el proceso de decisión interna de la pareja.

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2 La regla de reparto describe la forma en que se distribuye el ingreso no laboral entre los miembros de la pareja.

Contribuimos a la literatura económica proporcionado evidencia empírica con el soporte teórico del modelo colectivo para la oferta laboral de los miembros del hogar, en países donde todavía esta evidencia es limitada. Además, nos enfocamos en analizar si el poder de negociación dentro del hogar es una variable importante, para evaluar la desigualdad de género en países en desarrollo.

Introduction

This Doctoral dissertation adopts a micro-economic approach to study the time allocation decisions of self-employed and employed workers of Latin American countries. To this end, we develop three lines of research. The first focuses on knowing how social norms influence the distribution of total work between men and women. The second analyzes the differences in time devoted by self-employed and employed mothers to paid work, unpaid work, and child care. From a collective approach, unlike the unitary individual approaches of chapters I and II, in Chapter III, we analyze the factors that can influence the labor supply of the household members among whom a negotiation takes place.

As a preamble, we begin with the results of Campaña et al. (2016), who, for the specific case of Aragón, Spain, compare two periods of time (the first of economic bonanza and the second of economic crisis) and find for this Autonomous Community differences in the two periods analyzed.[3] In the first period, the authors find that self-employed women, in comparison with employed women, devote less time to paid work and more time to unpaid work and child care, but in the second period of time, self-employed women, in comparison with employed women, devote more time to paid work and unpaid work and spend less time in child care. The explanation for these results is that the economic crisis in Spain affected, in terms of occupation, more men than women (Castro and Santero 2014) so that many self-employed women would be obliged to provide a greater amount of income at home, devoting more hours per day to paid work. The authors argue that, in terms of public policy, it is necessary to give more support to self-employed women in, for example, formal child care services for their children.

In Chapter I, we study, from a unitary approach, the role played by social norms in the time dedicated to total work (sum of paid and unpaid work) by men and women, in three

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[3] A justification for the analysis of the Autonomous Community of Aragon appears in Madrona-Pérez (2014), which shows that the attraction of Aragon - pointing to advantages such as its privileged geographic location, the quality of its human capital, and its high levels of multimodal communications infrastructure - has allowed leading companies to invest in this community. Foreign investment in Aragon registered an increase of 25.5% comparing the periods (1994-2003) and (2004-2013). The report "European Cities and Regions of the Future (fDi) 2014-2015" points to the Autonomous Community of Aragon as the third most attractive region in Spain in which to invest, and the sixth in southern Europe. Madrona-Pérez and Villanueva Sánchez (2015), analyzing the period (2003-2015), show that the active population in Aragon has grown much faster than the opportunities for work, and as a consequence the number of unemployed in the second quarter of 2015 in Aragón more than tripled compared to the unemployed of the first quarter of 2003. In this context, regarding the difficulty of finding work, self-employment could be considered as an alternative for long-term unemployment.

Latin American countries. Prior research shows that, regardless of the particular characteristics of the country, women devote more time to unpaid work compared to men (Gershuny, 2000; Fisher and Robinson, 2011; Canelas and Salazar, 2014). Considering, also, a greater incorporation of women into the labor market (CEPAL, 2014; World Bank, 2017), in many countries, women devote more time to total work than do men (Gimenez-Nadal and Sevilla, 2012; Burda et al., 2013). These patterns lead us to consider the possible existence of "social norms", which may encourage an unequal distribution of total work time between men and women (Burda et al., 2013).

Analyzing the data from the time use surveys of Mexico (2009), Peru (2010) and Ecuador (2012), we observe differences between countries in terms of gender distribution in total work. Specifically, we find that Peru, compared to Mexico and Ecuador, is the country with a more equal gender distribution in total work. Based on this evidence, and in order to measure the effect of social norms on the distribution of total work between men and women, we use data from the World Values Survey (WVS) to create an index that measures the existence of social gender norms in the countries. We find in our econometric estimates that, when we include a gender norms index, the differences between men and women in the time dedicated to total work are reduced. Similarly, we analyze the differentiated behavior according to whether the workers are self-employed or employed, and we find that self-employed women and employed women devote more time to total work compared to self-employed men and employed men, respectively. The difference in time devoted to total work is greater in the case of self-employed women compared to self-employed men.

It is important to note that, in the comparisons between male and female workers (self-employed and employed workers), the inclusion of the gender norms index reduces the differences between men and women with respect to the time devoted to total work.

We contribute to the economic literature by identifying how social norms affect the distribution of gender in total work, providing evidence for a group of countries where this issue may be of special importance in the analysis of poverty and well-being.

In Chapter II, also using the classic unitary approach, we study the differences in time devoted by self-employed and employed mothers to paid work, unpaid work, and child care, in Latin American countries. It is important to make comparisons between these two groups since the existing evidence in developed countries shows that self-employed

mothers have a differential behavior with respect to child care time, in comparison with their salaried counterparts, and self-employed women dedicate more time to this activity (Giménez-Nadal et al., 2012; Johansson-Sevä and Öun, 2015). Based on this evidence, which shows different behaviors in time use between self-employed and employed women, we use data from the time-use surveys of Mexico (2009), Peru (2010), Ecuador (2012) and Colombia (2012) for our analyzes of Latin American countries. In our econometric estimations, we find in the four countries that self-employed mothers devoted less time to paid work and more time to unpaid work and child care, compared to employed mothers.

Assuming that self-employed mothers devote more time to child care than do employed mothers, we divide child care into two categories: non-educational child care (for example, feeding, bathing) and educational child care (for example, helping with homework, reading stories). The main interest of this division is to emphasize those activities aimed at increasing the human capital of children that are framed within educational child care. Our results show that self-employed mothers from Mexico, Ecuador, and Colombia devote more time to educational child care compared to employed mothers. In addition, we find differences in the time devoted to educational child care among self-employed and employed mothers according to different levels of education.

We contribute to the economic literature showing the benefits of self-employment in these countries, as a means of combining paid work with educational child care. The fact that many self-employed mothers devote more time to educational child care compared to employed mothers has important implications, since the human capital of children is a fundamental factor for their present and future results.

In Chapter III, we adopt a collective approach to understand and analyze what factors can influence the efficient participation of men and women in the labor market in Latin American countries. The collective approach has been commonly used to analyze time allocation decisions within households, but its evidence has focused on developed countries (Vermeulen, 2002; Donni and Chiappori, 2011; Chiappori and Mazzocco, 2018; Donni and Molina, 2018). According to this approach, the intrafamilial agreement is

reached through the so-called sharing rule, after assuming only that intrafamilial decisions are Pareto-efficient.[4]

For our analyzes of Latin American countries, using data from Time Use Surveys for Mexico (2009) and Colombia (2012), employing the collective model framework (Chiappori et al.,2002), we find evidence of Pareto-efficient labor supply decisions within households, as the collective rationality is not rejected in either country. We find that higher female wages are related to more labor market hours of female workers, and male workers show a more altruistic behavior towards females with the increase of their labor income. Regarding the distribution factors, the sex ratio is related to transfers of additional income from male to female workers in Colombia, which sheds light on the importance of distribution factors in the internal decision process of the couple.

We contribute to the economic literature by providing empirical evidence, with the theoretical support of the collective model for the labor supply of household members, in countries where this evidence is still limited. In addition, we focus on analyzing whether bargaining power within the household is an important variable, to assess gender inequality in developing countries.

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[4] The sharing rule describes the way in which non-labor income is distributed among the members of the couple.

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I. Chapter I: Total work and its distribution between men and women: An analysis based on social norms.

I.1 Introduction

In this chapter, we analyze gender differences in the time spent in total work, in three Latin-American countries, initially showing general evidence and subsequently differentiating between self-employed and employed workers. Total work is defined as the sum of the time devoted to paid and unpaid work (Burda et al., 2007, 2008, 2013; Gimenez-Nadal and Sevilla, 2012, 2014). Both paid and unpaid work have been analyzed in prior studies (Gershuny and Robinson, 1988; Casper and O'Connell, 1998; Bianchi, 2000; Gershuny, 2000; Folbre et al., 2005; Aguiar and Hurst, 2007; Gimenez-Nadal and Sevilla, 2012; Fox et al., 2013; Giddings et al., 2014). The analysis of how individuals allocate their time is important, given that differences in time use in paid and unpaid work may have implications for daily well-being (Kahneman et al., 2004; Kahneman and Kruger, 2006; Kruger, 2007; Sevilla et al., 2012; Gimenez-Nadal and Molina, 2015). The analysis of unpaid household production and the provision of household services is essential to understanding poverty, which also affects well-being (Gammage, 2010). Thus, the analysis of the time devoted to paid and unpaid work, in general, and how men and women distribute their time between paid and unpaid work, in particular, is important in questions of policy.

The existing literature on the determinants of the allocation of time in Latin American countries is flourishing, with several studies analyzing how individuals allocate their time in these countries (Newman, 2002; Medeiros et al., 2007; Milosavljevic, 2007; Esplen, 2009; Gammage, 2010; Canelas y Salazar, 2014, Calero et al., 2015). For instance, Newman (2002) examines the effects of women's employment on the allocation of paid and unpaid labor within the household in Ecuador and finds that women's labor market opportunities have no effect on women's total time in paid labor, but they do increase men's time in unpaid labor, which in turn reflects women's increased bargaining power

at home. Medeiros et al. (2007) analyze paid and unpaid work-time inequalities among Bolivian urban adults, finding that gender is an important variable in explaining how much paid and unpaid work is done by individuals. Canelas and Salazar (2014) find that women in Bolivia, Ecuador, and Guatemala are highly discriminated against in the job market and undertake most of the domestic activities in the household, allocating on average 40 hours per week to paid market activities and another 40 hours to in-home, unpaid activities.

A commonality that has been found independently of the characteristics of the countries is that women in general devote relatively more time to household production than do men (Gershuny, 2000; Esplen, 2009: Fisher and Robinson, 2011; Canelas and Salazar, 2014). Women continue to specialize in household tasks and care of others, and also concentrate on routine and more time-intensive unpaid work, such as cooking, cleaning, and caring for others, whereas men are more active in sporadic, less time-intensive tasks, such as gardening and repairs (Cohen, 1998; Hersch and Stratton, 2002; Sevilla et al., 2010; Grossbard et al., 2014). These patterns point to the existence of "gender roles" or "social norms", that may be seen as a coordinating device between the total work of both men and women and may encourage an inegalitarian distribution of time between men and women, in terms of total work (Burda et al., 2013). Examples of studies that have considered social norms as a factor affecting the time men and women devote to paid and/or unpaid work are Baxter (1997), Hook (2010), Treas and Drobnič (2010), Burda et al. (2007, 2008, 2013) and Gimenez-Nadal and Sevilla (2012, 2014).

Within this framework, we analyze time use data from Mexico (2009), Peru (2010), and Ecuador (2012), focusing on the time that men and women in these countries devote to total work, defined as the sum of the time devoted to paid work and unpaid work (e.g., household chores, child care). We explore the role social norms play in explaining the gender differences in the time devoted to total work. Social norms may be very important in this context, as in Latin-America the primary responsibility for the care of the sick, the elderly, and children still falls to women (Folbre, 2006; Esplen, 2009). Social norms in this context refer to flexibility regarding the participation of men in household production and caring activities, as men are often particularly resistant to doing household chores that directly attend to the needs of women and children. As argued by Sevilla et al. (2010), there exist norms of masculinity, in the sense that men may feel certain tasks more than

others undermine their status, and norms of femininity, as women may insist on the care of others due to their own internalized sense of self-worth. While this creates well-being for households, it imposes costs and substantial limitations on the female members of the family. More traditional social gender norms dictate that women bear the heaviest burden of total work, which, in turn, acts as a drag on economic development.

Following Alesina and Giuliano (2007) and Sevilla (2010) and using the latest wave of the World Values Survey (WVS, 2010-2014), we create a gender norms index aimed at measuring cross-country differences in gender norms. We apply Principal Components Analysis (PCA) to the following questions: 1) When a mother works for pay, the children suffer; 2) On the whole, men make better political leaders than women do; 3) A university education is more important for a boy than for a girl; 4) On the whole men, make better business executives than women; 5) Being a housewife is just as fulfilling as working for pay. We use cross-country variations of these questions to identify differences in the social norms of the country, which help us to identify the effects of social norms on the time allocation decisions of individuals.

Our econometric results show that women in the three countries analyzed devote more time to total work compared to men, and the gender gap in total work is reduced when we include the gender norms index in our estimates. These results are similar to those obtained in developed countries, where it is demonstrated that more egalitarian social norms reduce the differences in the time dedicated to total work between men and women (Burda et al., 2007, 2008, 2013; Giménez-Nadal and Sevilla 2012, 2014, Sevilla 2010). Based on this general analysis, and considering the differences in the distribution of time use when women are in the labor market or are housewives (CEPAL 2014), we make econometric estimations, distinguishing whether women participate in the labor market, or not. We find that when women are not participating in the labor market, men devote more time to total work compared to women, while when women are working, women devote more time to total work compared to men. We classify workers as self-employed or employed workers, finding that self-employed women and employed women devote more time to total work compared to self-employed men and employed men, respectively, although the difference is greater in the case of self-employed women (compared to self-employed men).

It is important to note that when we include the gender norms index in the case of women who are working (both for self-employed and employed workers) we find that more egalitarian social norms reduce the gender difference in the time dedicated to total work, while when women do not work, then more egalitarian social gender norms would add more responsibilities to men with respect to total work. Our results confirm the importance of social gender norms in the allocation of time of individuals from these countries.

Our contribution to the literature is threefold. First, we contribute to the analysis of gender differences in the uses of time for three countries in Latin-America. There are analyses of gender differences in the three countries (INEI, 2011; INEC, 2012; INEGI, 2014), but evidence is scarce in the analysis of cross-country comparisons and the role of social norms in explaining gender differences in the uses of time. The unpaid work obligations of women seem to negatively impact women's labor supply. In most developed countries, the shift toward a more egalitarian distribution has been achieved by reductions in total non-market time of women, albeit with some redistribution to men. (Gimenez Nadal and Sevilla, 2012). However, unpaid work is also productive and may contribute to the alleviation or redistribution of poverty. Thus, the focus should be on the redistribution of unpaid work between men and women, rather than on its reduction. This is an important point, because a reduction in overall unpaid work does not require normative change, while redistribution does.

Second, we contribute to the field of gender norms and their effects on the time-allocation decisions of individuals. Despite prior research on this topic, the contributions to date have focused on single countries, with an emphasis on developed countries. The comparison of gender norms across countries may be helpful in identifying their effects and may guide policies aimed at decreasing poverty for some specific groups of the population. Third, the prior research in developed countries that analyzes the effect of social norms on total work (Burda et al., 2007, 2008, 2013; Sevilla, 2010) does so in a general way, and does not make comparisons if individuals are in the labor market (or not). We contribute to the literature by providing differentiated evidence in this regard. It is important to make this kind of comparison since, in the case of Latin American countries, almost half of women of working age are outside the labor market (Mateo-Díaz and Rodríguez-Chamussy 2016). In addition, we classify workers into two groups, self-employed and employed workers, because the self-employed workers have different

behaviors to employed workers in the time dedicated to different activities (Giménez-Nadal et al., 2012; Johansson-Sevä and Öun, 2015; Campaña et al., 2016).

The remainder of the paper is organized as follows. Section 2 presents the theoretical framework. Section 3 presents the data, and the descriptive evidence. Section 4 explains our econometric strategy, and Section 5 presents the main results. Section 6 sets out our main conclusions.

I.2 Theoretical framework

Our theoretical framework is based on Gimenez-Nadal and Sevilla (2014).[5] who establish that time spent in total work is represented as:

$$TW^m = \varepsilon w^m \text{ and } TW^f = \varepsilon w^f,$$

where "m" is male, and "f" is female, and where we assume that the sensitivity of work to the wage rate "w" is equal across genders in each country. Focusing on gender differences in total work, we obtain

$$TW^m - TW^f = \varepsilon w^m - \varepsilon w^f = \varepsilon(w^m - w^f).$$

Gimenez-Nadal and Sevilla (2014) consider that the existence of gender norms in countries can influence the time devoted by individuals to total work. Characterizing these norms, established as TW^{m*} regarding the time that men should devote to total work and TW^{f*} in terms of the time that women should devote to total work, the impact of social norms with respect to total work in the following is measured in the interval $0 \leq \phi \leq \infty$. If $\phi = 0$, social norms established in the countries are not present and, therefore, individuals would choose $TW = \varepsilon w$ Meanwhile, if $\phi = \infty$, social norms have a considerable influence on men and women, forcing them to choose $TW^m = TW^{m*}$ and $TW^f = TW^{f*}$.

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[5] Gimenez-Nadal and Sevilla (2014) base their theoretical framework on the model proposed by Burda et al (2008). Burda et al (2008) focus on the time devoted to leisure and the level of development of countries, allowing the analysis to extend to the study of equitable behaviors between men and women in the case of the distribution of the total work.

For ϕ between 0 and ∞, the existence of gender norms would influence the optimal choice of total work, moving away from $TW = \varepsilon w$, heading towards TW^*, resulting in: $TW^m = \alpha(\varepsilon w^m) + (1 - \alpha) TW^{m*}$ and $TW^f = \alpha(\varepsilon w^f) + (1 - \alpha) TW^{f*}$, with the weight $0 \leq \alpha \leq 1$ and defined as $\alpha = 1/1 + \phi\varepsilon$.

A negative relationship is established between α and ϕ. If $\phi = 0$, $\alpha = 1$ there would be no influential social norms and individuals would freely choose their working time in accordance with $TW = \varepsilon w$. On the other hand, if $\phi = \infty$, $\alpha = 0$ gender norms have considerable influence and force men and women to choose $TWm = TW^{m*}$ and $TW^f = TW^{f*}$.

Focusing on gender differences in total work time, we have $TW^m - TW^f = \alpha\varepsilon (w^m - w^f) + (1 - \alpha) (TW^{m*} - TW^{f*})$. If $\alpha = 1$, the authors consider that gender social norms would not condition the choice and, therefore, the gender difference in total work could be explained by $TW^m - TW^f = \varepsilon(w^m - w^f)$. Sevilla (2010) makes a classification of 13 countries, from most to least egalitarian, showing which social norms have influence in various ways on men and women, depending on the country. Northern European countries, such as Norway and Sweden, are considered as more egalitarian countries (that is, they approximate $\alpha = 1$), while countries in southern Europe, such as Spain, are framed as less egalitarian ($\alpha < 1$), explaining that social norms have an effect on the time dedicated to total work by men and women. When a country is more egalitarian, the distribution of total work is more equitable, because men help more in domestic tasks and care activities.

I.3 Data

For our empirical analysis, we use the information included in time use surveys from Mexico (2009), Peru (2010) and Ecuador (2012).[6] These surveys are the first independent time-use surveys from the three countries, since data was only previously available through other types of survey, such as integrated household surveys. They provide us with information on individual time use and have become the typical instrument used to

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[6] In a previous version of the chapter, we included Colombia (2012) and results and conclusions were similar. We now exclude Colombia from the analysis because the Colombian time use-survey questionnaire is based on daily activities, and the other three surveys are based on weekly activities. Individuals organize their time differently and the information differs if it is obtained from an ordinary day or a weekend day (Connelly and Kimmel, 2009), so it would not be correct to multiply by seven the information obtained from the Colombia. Hence, for comparability reasons, we have excluded this country from the analysis. Results including Colombia in the analysis are available upon request.

analyze the time-allocation decisions of individuals (Bianchi, 2000; Gershuny, 2000; Folbre et al., 2005; Aguiar and Hurst, 2007; Ramey and Ramey, 2010; Gimenez-Nadal and Sevilla, 2012).

The methodologies for such surveys have been defined by the relevant institutes of statistics in each country: from INEGI (Instituto Nacional de Estadística y Geografía) in Mexico, from INEI (Instituto Nacional de Estadística e Informática) in Peru, and from INEC (Instituto Nacional de Estadísticas y Censos) in Ecuador. The targeted population are all members of households, in Mexico, Peru, and Ecuador, and the three surveys take as reference period the previous week. The three surveys are designed to be nationally representative. The targeted population are individuals aged 12 years or older living in private households of rural and urban areas of the whole country. More information on the technical aspects of the surveys, including their coverage and representativeness, can be found in the corresponding statistical agencies. (See the reference list for a direct link to the surveys' documentation).

Regarding the variables related to the time use of individuals, the three surveys use a list of pre-coded activities and the list of activities of the surveys comes from the following classifications: ICATUS (Clasificación Internacional de Actividades para Estadísticas sobre el Uso del Tiempo) in Peru, the CMAUT (Clasificación Mexicana de Actividades de Uso del Tiempo) for Mexico, and CAUTAL (Clasificación de Actividades sobre Uso del Tiempo para América Latina y Caribe) for Ecuador. The scheme from ICATUS is the benchmark for CMAUT and CAUTAL. However, the comparability across time use surveys in Latin America has still not been possible, as to date there is no common standardized classification of activities. The ICATUS has been the base for each country, although the countries have adapted it because they considered that the organization of the activities (e.g., in major groups of activities and sub-groups) does not fit their realities, they have difficulty in applying this classification to the field work, there are some activities missing, and some others are not needed. Thus, the countries have adapted the classification to their own backgrounds.[7] However, the fact that most of our

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[7] At the international level, some efforts have been made to harmonize time use surveys. In Europe, we find the HETUS (Harmonised European Time Use Survey) project, that launched a set of guidelines including sample instruments and coding frames, aimed at guiding countries in the design of their time use surveys. In Latin America, the CAUTAL was designed to have an only classification of activities, despite differences still exising across the countries. The experience in the harmonization of time use surveys has been shared in regular meetings and networks of time use, such as the International Association for Time Use Research (IATUR) and the International Society for the Study of Time (ISST).

analysis is based on the comparison of broad classification of activities (i.e., paid work, unpaid work, and child care) provides a good basis to run meaningful comparisons across countries (Gimenez-Nadal and Sevilla, 2012).

For purposes of comparison with prior studies (Aguiar and Hurst, 2007; Gimenez-Nadal and Sevilla, 2012), we restrict our sample to individuals between 21 and 65 years of age, who are not students or retirees, which gives us 28,480 observations for Mexico, 7,243 for Peru, and 23,345 observations for Ecuador. We use the demographic weights proposed by Katz and Murphy (1992) and applied in other time use studies (Aguiar and Hurtz, 2007, 2009; Gimenez-Nadal and Sevilla, 2012), in order to have the three countries equally represented.[8]

We define total work as the sum of the time devoted to market work, unpaid work, and child care. It is important to distinguish between unpaid work and child care since, as pointed out by Gimenez-Nadal and Molina (2013) and Campaña et al., (2017) those women who have a better position in the labor market, rather than reduce their time dedicated to the care of children in the home, increase it. Furthermore, Kahneman et al., (2004), Kahneman and Krueger (2006) and Krueger (2007) all show that the time parents spend on children is an enjoyable activity that offers a different level of (experienced) utility compared to unpaid work, indicating that unpaid work, and child care have different significance.

For comparison purposes, we base our classification of activities on Aguiar and Hurst (2007) and Gimenez-Nadal and Sevilla (2012), who consider separate categories for paid work, unpaid work, and child care. All the time devoted to these categories is measured in hours per week. Paid work includes all the time spent working in the paid sector, including main job, a second job where applicable, and overtime, including paid work at home and travel allowances, etc. Unpaid work includes any time spent in the preparation of meals, cleaning, laundry, ironing, dusting, vacuuming, maintenance (including painting and decorating), time spent on the procurement of goods and services (that is, buying groceries, shopping for items for the home), along with time spent on other productive activities at home, such as outdoor cleaning and vehicle repair. Child care includes all time spent on child care as main activity, such as food preparation for babies and children, washing and bathing, changing diapers, putting children and babies

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[8] The reference country is Ecuador. See Appendix I.A for further explanation of the demographic weights.

to bed, babysitting, medical care, reading to or playing with babies and children, helping with homework, and supervisory duties.[9]

I.3.1. *Empirical evidence*

Table I.1 presents the time devoted to paid work, unpaid work, child care, and total work by men and women in Mexico, Peru, and Ecuador. The last column shows the difference in the time devoted to each category by women and men and the statistical significance of the difference. The difference is measured as the time devoted by women to the reference time use category, minus the time devoted by men, and hence a negative difference indicates that women in that country devote comparatively less time to this activity than men. The statistical significance is based on a t-type test of equality of means. It can be seen that these three countries show statistically significant gender differences in paid work, unpaid work, and child care, indicating that men devote more time to paid work while women devote more time to unpaid work and child care. This is consistent with prior evidence from both developed and developing countries (Gershuny, 2000; Aguiar and Hurst, 2007; Fisher and Robinson, 2011; Gimenez-Nadal and Sevilla, 2012; Canelas and Salazar, 2014).

Regarding the time devoted to paid work, men in Peru, Mexico, and Ecuador devote 50.04, 47.81, and 47.92 hours per week to this activity, while women in the same countries devote 21.09, 20.25, and 20.00 hours per week to this activity, respectively. Hence, we observe a gender difference in the time devoted to paid work as men devote comparatively more (28.95, 27.57, and 27.92, respectively) hours per week in Peru, Mexico and Ecuador, with such differences being statistically significant at standard levels. Regarding the time devoted to unpaid work, men in Peru, Mexico, and Ecuador devote 14.12, 12.37 and 9.66 hours per week to this activity, while women in the same countries devote 40.95, 39.36 and 39.80 hours per week to this activity, respectively, leading to a gender difference in the time devoted to unpaid work of 26.82, 26.99, and 30.14 more hours per week for women in Peru, Mexico, and Ecuador.

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[9] See Appendix I.B for a description of all the activities included in each time use category.

Table I.1 Gender differences in the time devoted to paid work, unpaid work, child care and total work (hours per week)

Hours per week	Women		Men		
	Mean	SD	Mean	SD	Difference
Paid work					
Peru	21.09	(24.32)	50.04	(19.91)	-28.95***
Mexico	20.25	(25.34)	47.81	(23.91)	-27.57***
Ecuador	20.00	(24.22)	47.92	(16.95)	-27.92***
Unpaid work					
Peru	40.95	(19.32)	14.12	(11.69)	26.82***
Mexico	39.36	(21.02)	12.37	(14.34)	26.99***
Ecuador	39.80	(21.89)	9.66	(11.20)	30.14***
Childcare					
Peru	5.84	(7.98)	2.07	(3.19)	3.78***
Mexico	5.92	(8.58)	1.66	(3.56)	4.25***
Ecuador	6.76	(8.57)	1.64	(3.59)	5.12***
Total work					
Peru	67.89	(19.87)	66.23	(17.92)	1.66***
Mexico	65.52	(27.34)	61.85	(23.04)	3.67***
Ecuador	66.56	(29.15)	59.22	(18.33)	7.34***
Observations	31688		27380		

Note: Standard deviations in parentheses. The sample is restricted to individuals between 21 and 65, who are not students and are not retired. Paid work, unpaid work, child care and total work are measured in hours per week. Difference between genders calculated as the time devoted to paid work, unpaid work, child care, and total work by women, less time spent by men in these activities. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Demographic weights by Katz and Murphy (1992).

In the case of child care, men in Peru, Mexico, and Ecuador devote 2.07, 1.66, and 1.64 hours per week to this activity, while women in the same countries devote 5.84, 5.92 and 6.76 hours per week to this activity, respectively. Hence, we observe a gender difference in the time devoted to child care of 3.78, 4.25, and 5.12 hours per week in Peru, Mexico, and Ecuador, with women devoting more time to these activities. All the reported differences are statistically significant at standard levels. Considering the time devoted to total work, men in Peru, Mexico, and Ecuador devote 66.23, 61.85, and 59.22 hours per week to this activity, while women in the same countries devote 67.89, 65.52, and 66.56 hours per week to this activity, respectively. Hence, we observe that women devote 1.66, 3.67, and 7.34 more hours per week to total work in Peru, Mexico, and Ecuador. Thus, considering the three countries, women devote more time to total work in Ecuador, Mexico, and Peru. Furthermore, the size of the gender gap in total work varies by country, from 7.34 hours per week in Ecuador to 1.66 hours per week in Peru.

I.3.2. *Social norms: The World Value Surveys*

To analyze how social norms influence the distribution of total work in the analyzed countries, we construct a gender norms index to measure the degree of equality that is observed in the country. To that end, we use the data from the world values survey (WVS), which consists of nationally representative surveys conducted in almost 100 countries with a set of common questionnaires. The WVS is the largest non-commercial, cross-national, time series investigation of human beliefs and values ever executed, currently including interviews with almost 400,000 respondents. The WVS seeks to help in the analysis of topics such as economic development, democratization, religion, gender equality, social capital, and subjective well-being. The survey has six waves, and we have chosen the most recent wave, corresponding to the period 2010-2014, as most time use surveys used here correspond to this period of time.

To be consistent in our sample selection, we build the gender norms index using individuals between 21 and 65 years of age, who are not students or retired. Given that we have information on the geographical location of the individuals, we can match responses of respondents from the WVS to respondents of the time use surveys. For our study, we consider the regions of Rest of the Coast, Sierra, Selva, and Lima for Peru (four regions), Center, Center-West, North, South and South-East for Mexico (four regions), and Sierra, Costa, and Amazon for Ecuador (three regions). We consider five questions from a section of the survey concerning opinions regarding the roles of women in society, with the answers to these questions scaled as *1 (strongly agree), 2 (agree), 3 (disagree)*, and *4 (strongly disagree).* The questions we select to build the gender norms index are aimed at measuring individual opinions on gender neutrality, and are the following: 1) When a mother works for pay, the children suffer; 2) On the whole, men make better political leaders than women do; 3) A university education is more important for a boy than for a girl; 4) On the whole men, make better business executives than women; 5) Being a housewife is just as fulfilling as working for pay.

In order to combine several questions into one index, we follow the work of Alesina and Giuliano (2007), Sevilla (2010), and Fernandez-Crehuet et al. (2016), and use the Principal Component Analysis (PCA) technique.[10] From this analysis, we extract the first

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[10] Given that all the questions are measured using the same scale, we do not need to previously normalize the responses to these questions. We apply the varimax rotation for the computation of the weights.

principal component, and from it we use the factor loadings as weights for the questions. Hence, the weights assigned to each question are 0.25 to question (1), 0.55 to question (2), 0.54 to question (3), 0.56 to question (4), and 0.20 to question (5). When we apply these weights to the questions selected, we obtain a value for each respondent in the WVS.

Table I.2 allows us to see the average values obtained for each question (attitudes) for both men and women in the three countries, and this allows us to see how the gender norms index is built. We have ordered countries from the more neutral to the less neutral. We can see that Peru is shown as being more neutral, while Ecuador is listed as a less neutral country.[11] Given the nature of the questions, reflecting whether respondents agree or disagree with issues related to more neutral social norms, higher values of the gender norms index must be interpreted as evidence of more neutral social norms. Thus, it appears that individuals from Ecuador present a higher degree of agreement with the statements analyzed, and thus should present less neutral social norms, compared to individuals from Peru, who show a lower agreement with the statements. Considering the responses to the questions, Ecuador and Mexico present comparatively lower values, especially in questions 1) When a mother works for pay, the children suffer, and 3) A university education is more important for a boy than for a girl.

Regarding the relationship between the gender norms index, and the gender differences in total work, we observe that those countries with higher values of the gender norms index present lower values of the gender gap in total work. Conversely, those countries with lower values of the gender norms index present a higher value of the gender gap in total work. In fact, if at the country level we consider the correlation between the values of the gender gap in total work, and the average values of the gender norms index, the correlation coefficient is -0.89, showing a negative correlation between the gender norms index and the gender gap in total work.

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[11] The fact that the average values of the attitudes vary between men and women is common even in the most egalitarian countries. Hochschild (1989) shows that although men and women have equal behavior, men are more likely than women to embrace traditional values.

Table I.2. Gender norms index by country

Country	Gender norms index			Attitudes 1		Attitudes 2		Attitudes 3		Attitudes 4		Attitudes 5		Observations	
	Total	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
Peru	0.09	0.10	0.08	2.66	2.66	3.20	2.91	3.16	3.08	3.22	2.99	2.31	2.31	420	357
Mexico	-0.02	-0.03	-0.01	2.55	2.55	3.03	2.85	3.01	2.91	3.09	2.92	2.30	2.35	790	715
Ecuador	-0.07	-0.07	-0.06	2.11	2.25	3.00	2.79	3.13	2.91	3.09	2.93	2.21	2.29	500	427
Mean	0.00	0.00	0.00	2.45	2.49	3.06	2.85	3.08	2.95	3.12	2.94	2.28	2.32	1710	1499

Note: The sample is restricted to individuals between 21 and 65, who are not students and not retired, from the last wave of the World Value Survey. Countries are ordered from more to less neutral social norms, according to the average value of the gender norms index. Higher values for the Attitudes measures indicate more neutral social norms. Attitudes of 1 to 5, representing the average values given by the responses (1) strongly agree, (2) agree, (3) disagree and (4) strongly disagree with the following questions: (1) When a mother works for pay, the children suffer (2) On the whole, men make better political leaders than women do (3) A university education is more important for a boy than for a girl (4) On the whole men make better business executives than women (5) Being a housewife is just as fulfilling as working for pay.

Thus, our gender norms index, which aims to measure the degree of gender norms in social norms, indicates that, in those countries where the presence of neutral social norms is higher, the gender gap in total work is lower, which posits social norms as a factor affecting the gender distribution of total work. However, this raw correlation cannot be interpreted causally, as other factors may be affecting the gender gap in total work, and thus, in the following Section, we develop an econometric model in order to net out the effect of social norms from other socio-demographic and country-varying factors.

I.4 Econometric strategy

We estimate the regressions of the time dedicated to total work using Ordinary Least Squares (OLS) models. Gershuny (2012) argues that OLS models can offer accurate estimates of average activity times for samples and subgroups. Frazis and Stewart (2012) also prefer these models for the analysis of time-allocation decisions, while Foster and Kalenkoski (2013), discussing the analysis of child care time, compare OLS and Tobit models, finding that the qualitative conclusions of the two models are similar. We estimate the following equation:

$$T_{ik} = \alpha + \beta_1 Woman_{ik} + \sum_{J=1}^{n} \beta_{2j} X_{ikj} + \sum_{m=1}^{n} \beta_{3m} Z_{km} + \sum_{n=1}^{n} \beta_{4n} I_{kn} + \varepsilon_{ik} \qquad (1)$$

where T_{ik} is the time spent in total work by individual "i" in country "k", $Woman_{ik}$ takes value "1" if respondent "i" in country "k" is female, and "0" otherwise, x_{ik} is a vector of socio-demographic characteristics that includes primary education, university education (secondary education as reference), age, age squared, number of children in the household (aged 0 to 4 years, aged 5 to 12 years, aged 13 to 17 years), number of adult members of the household (18 years and older), the presence of a partner (married/cohabiting), the number of men and women working (participating in the labor market) in the household, living in a rural area or not, and whether respondent is indigenous or not.[12] Z_k represents country-specific factors, I_k represents dummy variables

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[12] To measure the effect of multicollinearity among predictors, we used the variance inflation factor (VIF) as a method to quantify the intensity of multicollinearity. The VIF provides an index that measures the extent to which the variance (the square of the estimated standard deviation) of an estimated regression coefficient increases because of collinearity. In this sense, if the variance of the coefficients increases, the model will not be as reliable. It is generally considered that there is multicollinearity when the inflation

of the countries (with Ecuador as reference), and ε_{ik} is the error term. The dummy variable $Woman_{ik}$ is included to measure gender differences among countries. $\beta_1 > 0$ indicates that women spend more time in total work than do men. Regarding the demographic characteristics, prior studies have shown the importance of controlling for characteristics such as age, education, race or ethnic origin, the size and structure of the household, and the urban or rural status of respondents (Gimenez-Nadal and Molina, 2013; Gimenez-Nadal and Sevilla, 2014; Grossbard et al., 2014).[13]

We also include country-varying factors in order to measure variables that may potentially affect the time devoted to total work by individuals. These factors include: growth rate of GDP per capita (annual), female labor force participation rate, masculinity ratio (sex-ratio), total fertility rate, and an indicator of the population aged 65 and above in the country. Regarding the inclusion of the growth of GDP per capita of the country, Burda et al. (2013) find that the gender gap in total work decreases with the level of development of the countries, as in rich countries the time amount men and women devote to total work is almost the same. Kabeer (2016) finds that women's 'overwork' allows for economic growth in these countries, as there is a positive relationship between the work done by women and economic growth. Thus, GDP per capita seems to have a relationship with the time allocation decisions of individuals, and thus it is an important factor to take into account when analyzing time allocation decisions of individuals, and differences in these decisions.

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factor between two variables is greater than 10 or when the average of all the inflation factors of all the independent variables is much higher than one. In our case, the values obtained from the VIF for each variable are between 1 without reaching 2, and the average value of the VIF is 1.32. So, we can indicate that there is no multicollinearity between these variables analyzed.

[13] See Appendix Table I.C1 for a description of the socio-demographic and household characteristics of individuals in the three countries. Appendix I.C (Table I.C2 and Table I.C3) shows the time devoted by men and women to paid work, unpaid work, child care, and total work, considering the presence of partner or not. We find that gender differences in total work are much greater when women do not have a partner. Studies such as Demo and Acock (1993) show that single mothers do more housework than married mothers, which would affect the time spent on total work. Comparing single fathers and single mothers, women do more housework than men (Fassinger, 1993; Hall et al., 1995). Appendix I.C (Table I.C4 and Table I.C5) shows the time devoted by men and women to the different activities, considering the presence, or not, of children under 18 in the household. As we can see in the tables, the gender differences in total work are accentuated by the presence of children in the home, highlighting the case of Ecuador. Gimenez-Nadal and Sevilla (2014) also show that gender differences in the time devoted to total work increase when children live in the household.

The female labor force participation rate may also be important as a factor affecting gender differences in the time devoted to total work. In countries with higher female labor force participation rate, women may be devoting more time to paid work, despite that they have to fulfill their socially-imposed unpaid responsibilities, which may increase the gender difference in the time devoted to total work. On the contrary, if the social norms of the country tend to be neutral, higher participation rate of women in the labor market may lead to men devoting more time to unpaid work, which may have no effect on the gender differences in total work or even reduce this gender difference. A priori, we cannot hypothesize if the relationship between the gender difference in total work and the female labor force participation rate is positive, negative, or null. Masculintiy ratio (sex-ratio) have been found to be an important factor in the value of women in the marriage market, and thus an important factor in the determination of the time devoted to market and unpaid work (Amuedo-Dorantes and Grossbard, 2007; Grossbard et al., 2014; Grossbard, 2015), as in countries where women are relatively scarce compared to men, the gender gap in total work will be lower. We use the masculinity ratio (sex-ratio), defined as the number of men per 100 women.

The number of children is important in determining the time men and women devote to total work, as children add child care responsibilities normally supported by women (Peacook, 2003; Esplen, 2009; Gimenez-Nadal and Sevilla, 2014). In countries with higher fertility rate, the time devoted to total work is expected to be higher, relative to countries with lower fertility rate, and it is also expected that higher fertility rate is associated with more time in total work for women, given that in these countries child care time falls almost entirely to women. Thus, we would expect a positive relationship between the total fertility rate and the time devoted to total work. Finally, we include a measure of the population aged 65 and over in the country of reference, as a measure of what Budlender (2010) defines as the care dependency ratio, an indicator of care demand. This variable is defined as the population aged 65 and above as a percentage of the total population of the country. In countries with a higher dependency ratio, the need for care may be higher, which affects the time devoted to total work by women, as care responsibilities fall almost entirely to women. Thus, higher dependency ratios may increase the gender gap in total work in the analyzed countries.

GDP per capita growth (annual) information comes from the World Bank for Peru and Ecuador and INEGI (National Institute of Statistics and Geography) for Mexico. This is

the annual percentage growth rate of GDP per capita based on constant local currency. The values correspond to the average of the years 2007, 2008, and 2009 for Mexico, the average of the years 2008, 2009, and 2010 for Peru and the average of the years 2010, 2011, and 2012 for Ecuador. The female labor force participation rate is obtained from the World Bank for Peru and Ecuador and from INEGI (National Institute of Statistics and Geography) for Mexico. This variable is the proportion of the population (women) who are economically active: all women who supply labor for the production of goods and services during a specified period. The values correspond to the average of the years 2007, 2008, and 2009 for Mexico, the average of the years 2008, 2009, and 2010 for Peru and the average of the years 2010, 2011, and 2012 for Ecuador. The Masculinity Ratio (sex-ratio) comes from INEI (National Institute of Statistics and Informatics) for Peru, INEGI (National Institute of Statistics and Geography) for Mexico and INEC (National Institute of Statistics and Census) for Ecuador. This variable is defined as the number of men per 100 women. The values correspond to the average of the years 2005 and 2010 for Mexico, the average of the years 2005 and 2010 for Peru and the average of the years 2007 and 2012 for Ecuador.

Fertility Rate information comes from the World Bank for Mexico and Ecuador and INEI (National Institute of Statistics and Informatics) and World Bank for Peru. This variable represents the number of children who would be born to a woman if she were to live to the end of her childbearing years, and bear children in accordance with current age-specific fertility rates. The values correspond to the average of the years 2007, 2008, and 2009 for Mexico, the average of the years 2008, 2009, and 2010 for Peru, and the average of the years 2010, 2011, and 2012 for Ecuador. Population aged 65 and over information comes from the World Bank for Peru and Mexico and INEC (National Institute of Statistics and Census) for Ecuador. This variable is a percentage of the total population, based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. The values correspond to the average of the years 2007, 2008, and 2009 for Mexico, the average of the years 2008, 2009, and 2010 for Peru, and the average of the years 2010, 2011, and 2012 for Ecuador.

Table I.3 shows average values of the country-varying factors. The highest level of growth of GDP per capita (annual) is found in Peru (4.90), while Mexico has a negative value (-1.64). Regarding female labor force participation rate, the highest rate is found in Peru (66.87) and Ecuador (54.07), and the masculinity ratio ranges from 96.08 in Mexico

to 100.56 in Peru. Total fertility rate is comparatively higher in Ecuador (2.63) and Peru (2.57), and the dependency ratio (i.e., percentage of population aged 65 and over) ranges from 5.67 in Mexico to 6.10 in Peru. When we compute the cross-country correlation between the gender gap in total work, and the selected country-varying factors, we find that correlations for the growth of GDP per capita (annual), female labor force participation rate, masculinity ratio, total fertility rate, and population aged 65 and over are 0.4695, 0.0826, 0.4385, 0.3615 and 0.3453, respectively. So, we see that the greatest correlation with the gender gap is the relation to the growth of GDP per capita (annual) and the masculinity ratio (sex-ratio).

Table I.3. Country-varying factors

Country	GDP Per Capita Growth (annual)	Female labor force participation rate	Masculinity Ratio (sex-ratio)	Total Fertility rate	Population aged 65 and over
Peru	4.90	66.87	100.56	2.57	6.10
Mexico	-1.64	42.98	96.08	2.40	5.67
Ecuador	3.97	54.07	100.41	2.63	6.04

Note. GDP per capita growth (annual) information comes from the World Bank for Peru and Ecuador and INEGI (National Institute of Statistics and Geography) for Mexico GDP per capita growth (annual) is the annual percentage growth rate of GDP per capita based on constant local currency. The values correspond to the average of the years 2007, 2008 and 2009 for Mexico, the average of the years 2008, 2009 and 2010 for Peru and the average of the years 2010, 2011 and 2012 for Ecuador. Female labor force participation rate is obtained from the World Bank for Peru and Ecuador and from INEGI (National Institute of Statistics and Geography) for Mexico. Female Labor force participation rate is the proportion of the population (women) who are economically active: all women who supply labor for the production of goods and services during a specified period. The values correspond to the average of the years 2007, 2008 and 2009 for Mexico, the average of the years 2008, 2009 and 2010 for Peru and the average of the years 2010, 2011 and 2012 for Ecuador. Masculinity Ratio comes from INEI (National Institute of Statistics and Informatics) for Peru, INEGI (National Institute of Statistics and Geography) for Mexico and INEC (National Institute of Statistics and Census) for Ecuador, Masculinity ratios are defined as the number of men per 100 women. The values correspond to the average of the years 2005 and 2010 for Mexico, the average of the years 2005 and 2010 for Peru and the average of the years 2007 and 2012 for Ecuador. Fertility Rate information comes from the World Bank for Mexico and Ecuador and INEI (National Institute of Statistics and Informatics) and World Bank for Peru. Total fertility rate represents the number of children who would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with current age-specific fertility rates. The values correspond to the average of the years 2007, 2008 and 2009 for Mexico, the average of the years 2008, 2009 and 2010 for Peru and the average of the years 2010, 2011 and 2012 for Ecuador. Population aged 65 and over information comes from the World Bank for Peru and Mexico and INEC (National Institute of Statistics and Census) for Ecuador. Population aged 65 and over as a percentage of the total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. The values correspond to the average of the years 2007, 2008 and 2009 for Mexico, the average of the years 2008, 2009 and 2010 for Peru and the average of the years 2010, 2011 and 2012 for Ecuador.

Country-varying factors (ref.: Ecuador) are also included in our regressions, in order to control for unmeasured factors that may influence the time devoted by men and women to total work. Factors such as differences in the institutional background, or culture (Carroll et al., 1994; Antecol, 2000; Fernández and Fogli, 2006,2009; Fernández, 2007;

Furtado et al., 2013) may help to explain cross-country differences in the gender gap in total work.

I.5 Results

Column 1 of Table I.4 shows the results of the estimation of equation (1), without considering country-varying factors, and with male being the reference category. We can see that β_1 is positive and statistically significant at standard levels, indicating that women devote 3.91 more hours per week to these activities. Thus, controlling for socio-demographic factors, we find that women devote more time to total work than men. Columns 2 to 6 of Table I.4 introduce the country-varying factors described previously. While all variables have coefficients that are statistically significant at standard levels, the coefficient measuring gender differences in total work does not significantly change in comparison with results shown in Column 1. Thus, while cross-country differences may help to explain differences in the time devoted to total work for men and women, we still find that women devote more time to total work than men. This conclusion does not change when we introduce country-varying factors, at the same time, in the regression (Column 7).

To measure the effect of social norms, we now introduce the gender norms index in Equation (1), with results shown in Column 8, and we observe that the gender gap in total work is reduced almost by one third. Specifically, the coefficient goes from 3.91 hours per week from Column (7) to 2.51 hours per week in column (8). The results in column 8 show that the gender norms index is positive and statistically significant at standard levels, indicating that in countries with more neutral social norms, men devote more time to total work, and thus the gender gap in total work is reduced. Regarding country-varying factors, we find that a higher growth rate of the GDP, higher female labor force participation rate, higher total fertility rate, and higher dependency rate (i.e., population aged 65 and over of the total population) all have a positive relationship to the time devoted to total work. On the other hand, a higher masculinity ratio or sex-ratio has a negative relationship to the time devoted to total work.

Table I.4. OLS regressions on the time devoted to total work

VARIABLES	(1) All	(2) All + GDP per capita Growth	(3) All + Female labor force	(4) All + Masculinity rate (sex-ratio)	(5) All + fertility rate	(6) All + population aged 65 and over	(7) All + country-varying factors	(8) All + gender norms index + country varying-factors
Woman	3.913***	3.914***	3.910***	3.906***	3.917***	3.900***	3.903***	2.509***
	(0.208)	(0.207)	(0.207)	(0.207)	(0.207)	(0.207)	(0.207)	(0.239)
Primary education	-2.586***	-2.605***	-2.553***	-2.574***	-2.614***	-2.643***	-2.633***	-2.572***
	(0.281)	(0.281)	(0.281)	(0.281)	(0.282)	(0.281)	(0.281)	(0.281)
University education	-1.005***	-1.003***	-0.987***	-0.986***	-1.016***	-1.087***	-1.042***	-1.061***
	(0.334)	(0.334)	(0.334)	(0.334)	(0.334)	(0.334)	(0.334)	(0.334)
Age	1.681***	1.686***	1.676***	1.685***	1.680***	1.676***	1.676***	1.677***
	(0.0638)	(0.0638)	(0.0638)	(0.0638)	(0.0638)	(0.0638)	(0.0638)	(0.0637)
Age squared	-2.082***	-2.089***	-2.077***	-2.087***	-2.081***	-2.077***	-2.078***	-2.079***
	(0.0760)	(0.0761)	(0.0761)	(0.0760)	(0.0760)	(0.0760)	(0.0760)	(0.0759)
N. adults	-5.521***	-5.522***	-5.528***	-5.541***	-5.517***	-5.521***	-5.532***	-5.505***
	(0.115)	(0.115)	(0.115)	(0.115)	(0.115)	(0.115)	(0.115)	(0.115)
N. children 0-4	2.430***	2.429***	2.435***	2.435***	2.432***	2.488***	2.497***	2.525***
	(0.160)	(0.160)	(0.160)	(0.160)	(0.160)	(0.159)	(0.159)	(0.159)
N. children 5-12	0.962***	0.958***	0.965***	0.957***	0.957***	1.021***	1.016***	1.024***
	(0.113)	(0.113)	(0.113)	(0.113)	(0.113)	(0.113)	(0.113)	(0.113)
N. children 13-17	-1.138***	-1.147***	-1.127***	-1.142***	-1.135***	-1.088***	-1.073***	-1.082***
	(0.144)	(0.144)	(0.144)	(0.144)	(0.144)	(0.144)	(0.144)	(0.144)
Presence of partner	1.040***	1.021***	1.054***	1.027***	1.032***	0.978***	0.958***	0.950***
	(0.246)	(0.246)	(0.246)	(0.246)	(0.246)	(0.246)	(0.246)	(0.245)
N. men working	4.634***	4.634***	4.639***	4.648***	4.643***	4.664***	4.673***	4.691***
	(0.184)	(0.184)	(0.184)	(0.184)	(0.184)	(0.183)	(0.183)	(0.183)
N. women working	9.529***	9.511***	9.533***	9.513***	9.538***	9.417***	9.386***	9.283***
	(0.162)	(0.162)	(0.162)	(0.162)	(0.162)	(0.162)	(0.162)	(0.162)
Rural area	1.877***	1.873***	1.908***	1.882***	1.821***	1.903***	1.943***	1.629***
	(0.229)	(0.229)	(0.229)	(0.229)	(0.230)	(0.229)	(0.231)	(0.232)
Indigenous	3.693***	3.790***	3.628***	3.662***	3.606***	3.795***	3.863***	3.453***
	(0.350)	(0.351)	(0.351)	(0.350)	(0.353)	(0.350)	(0.355)	(0.358)
GDP per capita growth	-	1.172***	-	-	-	-	4.234***	3.518***
	-	(0.357)	-	-	-	-	(0.946)	(0.949)
Female labor force participation	-	-	1.247***	-	-	-	4.347***	3.374***
	-	-	(0.425)	-	-	-	(0.865)	(0.870)
Masculinity ratio (sex-ratio)	-	-	-	-0.309***	-	-	0.264*	0.122
	-	-	-	(0.0624)	-	-	(0.137)	(0.137)
Fertiliy rate	-	-	-	-	1.735***	-	1.565***	2.232***
	-	-	-	-	(0.542)	-	(0.542)	(0.546)
Population aged 65 and over	-	-	-	-	-	1.149***	1.152***	1.274***
	-	-	-	-	-	(0.107)	(0.107)	(0.110)
Gender norms index	-	-	-	-	-	-	-	11.92***
	-	-	-	-	-	-	-	(1.069)
Peru	2.127***	1.029**	-13.82**	2.181***	2.127***	2.714***	-56.90***	-44.81***
	(0.284)	(0.438)	(5.440)	(0.284)	(0.284)	(0.286)	(11.87)	(11.92)
Mexico	1.026***	7.571***	14.86***	-0.384	1.408***	2.126***	75.54***	60.30***
	(0.221)	(2.006)	(4.716)	(0.356)	(0.252)	(0.239)	(14.96)	(15.03)
Constant	33.27***	28.54***	-34.09	64.26***	28.75***	25.80***	-256.7***	-222.8***
	(1.304)	(1.945)	(22.97)	(6.392)	(1.908)	(1.480)	(61.78)	(61.87)
R-squared	0.127	0.128	0.128	0.128	0.127	0.129	0.130	0.132
Observations	59,068	59,068	59,068	59,068	59,068	59,068	59,068	59,068

Note: Robust standard errors in parentheses. The sample is restricted to individuals between 21 and 65 who are not students and not retired. Total work is measured in hours per week (see Appendix I.B for a description of the activities included in the category). Primary education is equivalent to less than a high school degree, secondary education is equivalent to high school degree, and university education is equivalent to more than a high school degree. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Demographic weights by Katz and Murphy (1992), Ecuador considered as reference country.

Thus, while some factors negatively affect the gender gap in total work, others affect this gender gap in total work positively, highlighting the importance of economic and social conditions in shaping gender inequality. Considering the socio-demographic and household characteristics of individuals, we observe that having primary and university education are related to less time in total work in comparison with having secondary level of education, age has an inverted u-shaped form, with the maximum time devoted to total work reached at the age of 40[14]. The number of household members (adults) is negatively associated with the time devoted to total work, although the number of children is positively associated with more time in total work, with the age of children affecting differentially the time devoted to total work. Furthermore, the presence of a partner, living in an urban area, and being indigenous are all positively related to the time devoted to total work.

Based on this general analysis, most of the studies that have been undertaken by the Latin American statistical agencies show significant differences in the time use of women who are employed versus those who are housewives. (CEPAL, 2014). Thus, the labor force participation of women may be important in determining the time devoted to total work, and thus the gender gap in total work. In our sample, 46.19%, 46.68% and 56.34% of women report being in work, in Ecuador, Mexico and Peru, respectively. When we compare gender gaps in total work according to the labor force status of women, we find (see Tables I.C6 and I.C7 of the Appendix) that, in comparison with women who do not work, working men devote more time to total work than do women (6.60, 8.63, and 5.38 more hours in Ecuador, Mexico and Peru, respectively), while in comparison with working women, working men devote less time to total work than do women (7.17, 14.25, and 22.50 fewer hours in Ecuador, Mexico and Peru, respectively).Thus, here we must acknowledge that the gender gap in total work depends on the labor status of women.

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[14] Considering that men and women, according to their age, devote more or less time to total work, and this affects the gaps in the time dedicated to this activity, Table I.C10 (Appendix 1.C) shows the results of the estimation of equation (1), when we separate the analyzed individuals by age. We consider five age ranges: 21-29 years, 30-39 years, 40-49 years, 50-59 years, 60-65 years. We find that in the range of 30 to 39 years, the greatest differences in the time dedicated to total work between men and women are present, since in this range women dedicate 6.88 more hours per week to total work compared to men. When including our gender norms index, the differences are reduced by approximately one hour, since the coefficient that measures these differences goes from 6.88 hours to 5.96 hours a week. It is also important to note that when the social gender norm index is included in all subsamples analyzed, this index is positive and statistically significant, modifying the gender gaps in total work in all age groups.

When women work, women do more total work than men. On the contrary, when women do not work, they do comparatively less total work than men.[15]

Given that there are differences in the gender gap according to the labor status of women, we have done the analysis comparing men with women who work and those who do not work. Table I.5 (Columns 1 and 3) show the results of estimating Equation (1) when we restrict the sample to working men and non-working women (Column 1) and working men and working women (Column 3), respectively.[16] Results shown in the previous paragraph are confirmed. For the regression comparing working men and non-working women, we observe that there is a gender gap in total work, as men devote 7.13 more hours per week to these activities in comparison to women. When we compare working men and working women, we observe that women devote 16.75 more hours per week to these activities in comparison to men. As can be seen in these results, it is important to consider the participation, or not, of women in the labor market, since different behaviors are observed in the time devoted to total work by men and women.

When we introduce the gender norms index for the two previous sub-samples (Columns (2) and (4) of Table I.5), differences in total work between men and women are still significant, although their magnitudes are different. Regarding the results of non-working women, the difference in the time devoted to total work by men in comparison to women increases by one hour (from 7.13 hours to 8.34 hours per week) when we include the gender norms index in the regression. Regarding results for working women, the difference in the time devoted to total work by women in comparison to men decreases by around one hour (from 16.75 hours to 15.77 hours per week). Furthermore, in the two subsamples, the gender norms index is positive and statistically significant at standard levels, which indicates that social norms may help to explain the gendered distribution of total work. In the specific case of working women, who devote more time to total work than men, social norms tending towards more neutral roles of men and women in the country help to reduce the difference in total work.

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[15] We do not consider household men who do not work, because in our sample almost all the men of the household work (Ecuador, 95.86%, Mexico, 88.66%, and Peru, 93.74%).

[16] To make the estimations in Table I.5 (columns 1 and 2) we have considered as sample those individuals who are members of households, in which the women of these households do not report participating in the labor market, while the men of these households do. Regarding the estimates in Table I.5 (columns 3 and 4), we restrict our sample to men and women who work. The individuals analyzed are between 21 and 65 years old (inclusive), they are not students, nor are they retired (previous restrictions).

Table I.5. OLS regressions on the time devoted to total work

VARIABLES	(1) Men working and women not working	(2) Men working and women not working + gender norms index	(3) Men and women working	(4) Men and women working + gender norms index	(5) Men and women working (employed)	(6) Men and women working (employed) + gender norms index	(7) Men and women working (self-employed)	(8) Men and women working (self-employed) + gender norms index
Woman	-7.130***	-8.340***	16.75***	15.77***	16.12***	15.15***	17.36***	16.59***
	(0.277)	(0.309)	(0.294)	(0.323)	(0.351)	(0.389)	(0.523)	(0.570)
Primary education	-2.016***	-1.908***	-1.799***	-1.761***	-1.707***	-1.672***	-2.055***	-2.016***
	(0.380)	(0.381)	(0.298)	(0.298)	(0.347)	(0.347)	(0.563)	(0.563)
University education	-1.358***	-1.372***	-3.692***	-3.710***	-3.916***	-3.941***	-1.549**	-1.551**
	(0.511)	(0.511)	(0.340)	(0.340)	(0.383)	(0.383)	(0.738)	(0.738)
Age	0.991***	0.992***	0.916***	0.917***	0.818***	0.819***	1.102***	1.100***
	(0.0847)	(0.0846)	(0.0705)	(0.0704)	(0.0844)	(0.0843)	(0.133)	(0.133)
Age squared	-1.242***	-1.246***	-1.112***	-1.112***	-1.011***	-1.012***	-1.334***	-1.332***
	(0.101)	(0.101)	(0.0842)	(0.0842)	(0.103)	(0.103)	(0.151)	(0.151)
N. adults	-3.464***	-3.441***	-2.530***	-2.512***	-2.750***	-2.729***	-2.065***	-2.054***
	(0.169)	(0.168)	(0.123)	(0.123)	(0.144)	(0.144)	(0.226)	(0.226)
N. children 0-4	2.491***	2.507***	2.085***	2.109***	2.318***	2.350***	1.563***	1.573***
	(0.211)	(0.211)	(0.175)	(0.175)	(0.207)	(0.207)	(0.316)	(0.316)
N. children 5-12	1.050***	1.059***	1.018***	1.023***	0.972***	0.981***	1.122***	1.123***
	(0.147)	(0.147)	(0.125)	(0.125)	(0.152)	(0.152)	(0.213)	(0.214)
N. children 13-17	-0.565***	-0.580***	-0.662***	-0.665***	-0.627***	-0.630***	-0.759***	-0.757***
	(0.193)	(0.192)	(0.155)	(0.155)	(0.181)	(0.181)	(0.279)	(0.279)
Presence of partner	2.313***	2.292***	2.003***	1.973***	2.523***	2.494***	0.916*	0.890*
	(0.382)	(0.381)	(0.263)	(0.263)	(0.310)	(0.310)	(0.481)	(0.481)
N. men working	2.163***	2.221***	1.379***	1.390***	1.722***	1.729***	0.916**	0.925**
	(0.287)	(0.286)	(0.203)	(0.203)	(0.237)	(0.236)	(0.371)	(0.371)
N. women working	-	-	0.965***	0.898***	0.806***	0.739***	1.283***	1.231***
	-	-	(0.188)	(0.189)	(0.218)	(0.219)	(0.354)	(0.355)
Rural area	1.661***	1.374***	0.433*	0.182	-1.525***	-1.714***	3.207***	2.938***
	(0.286)	(0.287)	(0.257)	(0.260)	(0.302)	(0.305)	(0.457)	(0.465)
Indigenous	3.102***	2.630***	2.082***	1.784***	2.310***	2.019***	1.192**	0.977*
	(0.458)	(0.464)	(0.384)	(0.388)	(0.535)	(0.539)	(0.557)	(0.562)
GDP per capita growth	5.949***	5.102***	1.371	0.800	1.883	1.373	-0.829	-1.364
	(1.245)	(1.250)	(1.055)	(1.059)	(1.202)	(1.207)	(2.135)	(2.145)
Female labor force participation	5.048***	4.042***	3.511***	2.815***	4.310***	3.670***	0.530	-0.0982
	(1.165)	(1.172)	(0.956)	(0.962)	(1.076)	(1.082)	(2.012)	(2.024)
Masculinity rate	0.400**	0.280	-0.00665	-0.0845	0.196	0.127	-0.784**	-0.858**
	(0.180)	(0.181)	(0.151)	(0.151)	(0.167)	(0.168)	(0.336)	(0.336)
Fertiliy rate	1.995**	2.900***	-0.916*	-0.453	-1.826**	-1.519**	0.262	0.748
	(0.821)	(0.831)	(0.556)	(0.562)	(0.767)	(0.769)	(0.854)	(0.868)
Population aged 65 and over	0.810***	1.047***	0.997***	1.202***	0.499***	0.674***	1.539***	1.724***
	(0.136)	(0.143)	(0.112)	(0.120)	(0.133)	(0.140)	(0.184)	(0.201)
Gender norms index	-	10.77***	-	8.032***	-	7.943***	-	6.448***
	-	(1.308)	-	(1.118)	-	(1.376)	-	(1.863)
Peru	-62.91***	-50.07***	-43.41***	-34.51***	-52.84***	-44.81***	-4.715	3.456
	(15.95)	(16.03)	(13.13)	(13.20)	(14.79)	(14.86)	(27.51)	(27.66)
Mexico	95.47***	79.32***	50.03***	39.07**	63.07***	52.99***	0.436	-9.507
	(19.91)	(20.01)	(16.58)	(16.67)	(18.75)	(18.84)	(34.44)	(34.62)
Constant	-301.8***	-266.0***	-150.8**	-128.0*	-209.0***	-189.5**	87.17	110.2
	(82.39)	(82.53)	(68.33)	(68.42)	(76.91)	(77.00)	(144.6)	(144.8)
R-squared	0.094	0.096	0.170	0.171	0.179	0.180	0.169	0.170
Observations	27,079	27,079	38,608	38,608	24,774	24,774	13,834	13,834

Note: Robust standard errors in parentheses. The sample is restricted to individuals between 21 and 65 who are not students and not retired. Total work is measured in hours per week (see Appendix I.B for a description of the activities included in the category). Primary education is equivalent to less than a high school degree, secondary education is equivalent to high school degree, and university education is equivalent to more than a high school degree. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Demographic weights by Katz and Murphy (1992), Ecuador considered as reference country.

In the specific case of non-working women who devote less time to total work than men, social norms tending towards more neutral roles of men and women in the country seem to add more responsibilities to men regarding total work, which contributes to increase the gender gap in total work. All in all, our results point towards social norms affecting the time men and women devote to total work, with more neutral social gender norms adding responsibilities regarding total work for men. Based on the analysis presented in columns 3 and 4 (Table I.5), in which we compare differences in the time devoted to total work by working men and working women, we consider it important to classify these workers as either self-employed or employed workers. The justification for this classification is that the self-employed have a different behavior with respect to the time dedicated to different activities, in comparison with their salaried counterparts (Giménez-Nadal et al., 2012; Johansson-Sevä y Öun, 2015; Campaña et al., 2016).

Columns (5) and (7) of Table I.5 show the results of the estimation of equation (1) when we restrict the sample to employed men and women (column 5), and self-employed men and women (column 7).[17] The results of column (5) show that employed women devote 16.12 more hours per week to total work compared to employed men. And column (7) shows that when we compare men and women who are self-employed, self-employed women spend 17.36 hours more per week in total work than do self-employed men. Self-employed women have a greater total workload than employed women. When we introduce the gender norms index for the two previous subsamples (columns (6) and (8) of Table I.5), the differences in the time devoted to total work between men and women are still significant, although with different magnitudes. In the case of employed workers (column 6), the difference in time devoted to total work by employed women compared to employed men decreases by one hour (from 16.12 hours to 15.15 hours per week), and in the case of self-employed workers (column 8), the difference in the time devoted to total work by self-employed women compared to self-employed men also decreases by approximately one hour (from 17.36 hours to 16.59 hours a week). In both subsamples, the gender norms index is positive and statistically significant at standard levels.

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[17] To make the estimations in Table 1.5 (columns 5, 6, 7 and 8) we restrict our sample to men and women who are participating in the labor market and report being employed or self-employed workers, respectively. The individuals analyzed are between 21 and 65 years old (inclusive), they are not students, nor are they retired (previous restrictions).

As robustness checks (Appendix C, Table I.C11), we have changed the way we build the gender norms index to test for the validity of our results. First, we exclude the demographic weights in our estimations (column 3). Second, we compute the gender norms index based on the PCA technique, where we apply weights to each country separately (column 4). Third, we compute the gender norms index with weights applied to each region of each country separately (column 4), as there may be cross-regional variations in the responses to these questions within each country. We also use an alternative gender norms index, where we exclude one question at a time in the construction of the index, to determine whether that question makes a difference when used to build the neutrality index. In particular (column 6 and column7 respectively), we exclude question 1 (attitude 1) or question 5 (attitude 5) in the computation of the neutrality index. Results shown in Appendix Table I.C11 are consistent with those shown in Table I.4.

In summary, we have documented a gender gap in total work in the three analyzed countries, with women devoting comparatively more time to these activities than men. As a possible channel through which the gender gap in total work emerges, we propose that of social norms, and we create a gender norms index to measure cross-country differences in social norms regarding the neutrality of gender roles in society. When we include this index in our analysis, gender differences in total work are reduced, which may indicate that social norms play a significant role in these countries. Thus, we identify cross-country differences in social norms, and show how they contribute to the gender distribution of total work.

I.6 Conclusions

In this Chapter, we analyze the time-allocation decisions of men and women in three Latin-American countries, using time use surveys from Mexico (2009), Peru (2010), and Ecuador (2012). The results indicate that Ecuador has comparatively larger gender differences in the distribution of total work. To explain these gender differentials, we examine the influence of social norms in each country by constructing a gender norms index from data contained in the last wave (2010-2014) of the World Values Survey (WVS), which allows us to determine that those countries with more neutral social norms, present smaller gender differences in total work. Our econometric results indicate that

when we include the gender norms index the gender gap in total work is reduced, in a general analysis and when we compare men and women who are in the labor market and, in turn, when we classify them as self-employed or employed workers. Thus, social norms appear to be an important factor in explaining gender difference in total work.

It can be argued that the fundamental scarce resource in the economy is time. More importantly, unlike the scarcity of goods, the 24 hours per day time constraint does not relax in a growing economy (Hamermesh and Lee, 2007). Uncovering how individuals allocate their time outside of the market is thus crucial for increasing our understanding of the dynamics of economic change and welfare. The analysis of time allocation decisions of individuals is important in order to have a complete view of individual well-being, given the limitations of GDP as a measurement of well-being and development (Folbre, 2006). Stiglitz et al (2009) have recently proposed a broad range of measures of household economic activity to evaluate the quality of life, including time spent in unpaid work, child care, and care of others. The fact that we find women devoting more time to total work than do men may indicate that women may have a lower level of well-being in these countries, and more related health problems. Family policies that challenge the existing gender structure, such as paternity leave, or gender-based taxation schemes, with higher marginal tax rates for men (Alesina et al. 2011), may constitute a good starting-point for successfully shifting the household division of labor in a more egalitarian direction.

One of the sources of gender inequality is the care of others. Here, several strategies can be used to foster a more egalitarian distribution of care activities, where the implementation of public care centers, cash payments, or tax benefits, may serve as a source of greater gender equality. While all these interventions may seem a starting point to reduce gender inequality in total work, part of this inequality can be explained by the social norms of the particular country, where a normative change may be very difficult to bring about.

We also find that macroeconomic conditions, such as the growth rate of GDP, are related to gender inequality in total work. In the specific case of GDP, we find that higher growth of GDP is associated with greater inequality in the time devoted to total work. This result is consistent with Kabeer (2016), who finds that women's 'overwork' allows for economic growth in these countries. This result raises questions about the role economic factors - such as productivity, improvement of infrastructure, or employment

policies - play in the explanation of economic growth. Furthermore, the structure of the population also appears to affect gender inequality in total work, as the care of others plays an important role. Population projections in these countries may help to propose possible trends in gender inequality in total time.

One limitation of our analysis is that our data is a cross-section of individuals, and does not allow us to identify differences in the time devoted to total work, net of (permanent) individual heterogeneity in preferences. At present, there are no panels of time-use surveys currently available, and we leave this issue for future research. Furthermore, despite that we offer a general view of the time devoted to total work, the data at hand do not allow us to consider issues such as the quality or intensity of work. Floro and Pichetpongsa (2010) analyze the work intensity of Thai workers, and find that women workers experience a higher incidence of work intensity, and hence lower quality of life, compared to men. If we were able to analyze inequalities in the gender distribution of work, and also differences in how individuals experience this time, policy-makers would be able to design more effective programs and economic and social policies. Researchers have measured differences in daily experiences in the use of time (Kahneman et al., 2004; Kahneman and Krueger, 2006; Knabe et al., 2010; Connelly and Kimmel, 2015; Gimenez-Nadal and Molina, 2015) in developed countries, which could be used as a guide to measure quotidian experience in Latin American countries.

I.7 References

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Appendix I.A: Demographic weighting

Following prior studies of individual time-use, such as Aguiar and Hurst (2007) and Gimenez-Nadal and Sevilla (2012, 2014), we take Ecuador as the reference country, and assign weights to the samples of Mexico and Peru, so that similar individuals are equally represented in the three countries. The demographic weights are used to allow for a proportional representation of individuals in the three countries. In this sense, the demographic weights give equal importance to the same groups of individuals in the three countries and thus results do not depend on the higher or lower representativeness of one group or another.

We divide the sample into demographic cells of five age groups (21-29, 30-39, 40-49, 50-59 and 60-65), three levels of education (primary, secondary, and university), gender, whether there are children in the household, and whether the respondent lives in a couple or not. To calculate the constant weights, we unify the three surveys and calculate the percentage of the population that would be within each cell population, in each survey. We compute the percentage of men and women in each cell population (based on age, education, presence of children, and life partner) and these percentages sum to one for both men and women.

Table I.A1 shows the summary statistics of the demographic variables used to calculate the constant demographic weight, mainly observed differences in education levels: 21% of Peruvian women have an education level above high school, compared to 16% and 14% of Mexican and Ecuadorian women, respectively. It is important to note that there is a greater-than-average presence of children in these households. Gimenez-Nadal and Sevilla (2012) show that these differences may determine changes in the distribution of time-use, as a greater presence of children in the household probably leads to more time dedicated to child care. In addition, a higher education, as Becker (1965) argues, means more time spent in paid work, due to the greater opportunity cost of time.

Table I.A1. Summary statistics for demographic characteristics, by country

	Age	Primary Education		Secondary Education		University Education		Presence of children	Living in a couple	Observations men	Observations women
		Men	Women	Men	Women	Men	Women				
Ecuador	41.22	0.66	0.68	0.20	0.19	0.14	0.14	0.75	0.72	10771	12574
	(11.99)	(0.47)	(0.47)	(0.40)	(0.39)	(0.35)	(0.34)	(0.43)	(0.45)		
Mexico	39.24	0.68	0.70	0.13	0.14	0.19	0.16	0.69	0.71	13173	15307
	(11.87)	(0.47)	(0.46)	(0.33)	(0.34)	(0.39)	(0.37)	(0.46)	(0.45)		
Peru	40.73	0.45	0.56	0.31	0.24	0.24	0.21	0.76	0.72	3436	3807
	(11.96)	(0.50)	(0.50)	(0.46)	(0.42)	(0.43)	(0.41)	(0.43)	(0.45)		

Note: The sample is restricted to individuals between 21 and 65 who are not students and not retired. Primary education is equivalent to less than a high school degree, secondary education is equivalent to high school degree and university education is equivalent to more than a high school degree. Presence of minors refers to household members under age 18. Standard deviations in parentheses.

Appendix I.B: Classification of activities

Table I.B1. Peru

Paid work	Regular work in all paid jobs, travel to all paid jobs. Travel time associated with the different work categories is considered as time devoted to the same work category.
Unpaid work	Cooking or preparing food, heating food, prepare food in advance, wash dishes and clean the kitchen, take food to household members to work or study centre, collect firewood for cooking, lighting firewood for cooking, prepare pastries for home, making beds and ordering room, clean the bathroom, general cleanliness of housing, accommodate and fix housing, tasks related to the trash, carry water for household consumption, clean or wash vehicles home, laundry, ironing clothes, accommodate clothing, take clothes to the laundry, shoe care, mending clothing, home repairs, making housing constructions, appliance repairs, carry appliances repair, care for household members who are sick, bring the hospital household members who are sick, bring to receive therapy household members who are sick, prepare home remedies, buy household items, small household purchases, buying medicine for home, buy school supplies, buy clothes, buy furniture, buy spare parts for appliances, buy cars, buy spare parts for cars, farm animal breeding, plant/ watering/fertilize the orchard, pick fruit or herbs in the orchard, carrying water for the orchard or animals, supervise home repairs, supervising chores, responsibility for household accounts, several payments, several formalities, charge government subsidies, responsible for the safety of home, watch for the delivery of a service in the home such as gas, paperwork to rent or buy a house; The following aid for household members who are dependent: cook, clean room, washing/ironing clothes, feed them, bathing, care during the hours of the night, picking up or dropping care center/study center, carry health center, practice therapy; The following to help to other households: cooking, general cleaning, fetching water, washing and ironing clothes, home repairs, care of children, health care, carry to medical center, help with shopping, perform formalities, take to work/educational centre.
Childcare	Breastfeed newborn, feeding a baby or child, bathing/dressing/ changing diaper a baby or child, play/read stories to a baby or child, help with homework for a child or teenager, attend activities at an educational center that assists a child or adolescent who is a member of the household, therapy practice for a baby/child/adolescent, carry household members to educational centre, pick up household members at educational centre

Source: Time Use Survey of Peru 2010

Table I.B2. Mexico

Paid work	Regular work in all paid jobs, travel from/to all paid jobs. Travel time associated with the different work categories is considered as time devoted to the same work category.
Unpaid work	Care for or raise farm animals, caring and sow the orchard, collect/ carry/store firewood, collecting fruits/mushrooms/flowers, hunting and fishing for consumption, carry or store water, elaborate or knitting clothes/tablecloth/curtains/other, threshing corn or prepare tortillas, turn the stove or oven, cooking or preparing food or drinks, heating food or drinks, serve food, washing/drying/accommodate dishes, bringing food to a household member to work or an educative center, cleaning or tidying the house, cleaning the exterior of the house, separate/remove/burn trash, wash/tender/drying clothes, separate or fold the clothes, ironing clothes, mend clothes/tablecloth/curtains, collect or bring clothes and shoes, clean shoes, construction or extension of the home, home repair, appliance repair, carry or supervise appliance repair, wash or clean the vehicle, repair or maintain the vehicle, carry or repair the vehicle, home shopping, purchase construction materials, several purchases as: dishes/tablecloths/ furniture/toys/clothing/footwear, carry or bring to an older person's home for medical care, supervise the construction or repair of the house, buy car/house/apartment, make payments/formalities from home, responsible for accounts/household expenses, protection measures for home, waiting home services like gas; The following aid for household members who are dependent: feeding, bathing or cleaning, administer medications, take them to receive medical attention, give special therapy or exercises; The following to help to other households: help with unpaid work, caring for people
Childcare	Feeding a minor under 6 years, bathing/grooming/dressing a minor under 6 years, bed a minor under 6 years, picking up or dropping of a educative center a minor under 15 years, help with homework a minor under 15 years, attend activities/meetings/festivals in school from a member of household under 15 years, carrying/bringing/accompany a minor under 15 to receive medical attention

Source: Time Use Survey of Mexico 2009

Table I.B3. Ecuador

Paid work	Regular work in all paid jobs, travel from/to all paid jobs. Travel time associated with the different work categories is considered as time devoted to the same work category.
Unpaid work	Preparing food, serving food, washing dishes, cleaning the place where food is prepared, thresh and grinding grain, beverage preparation, slaughtering of animals for consumption, bringing food to a household member, turn the wood/coal stove, making preserves, make bread, preparing other food products, prepare milk, dried beans, dried meat, dried fish products, making beds, cleaning bathrooms, cleaning house, fetch water for household consumption, wash a vehicle, littering, shoe cleaning, laundry, ironing clothes, take clothes to the cleaners, fold clothes, draw up or mend clothes, buy meats/vegetables/fruits, daily shopping, buy medicine, buy school supplies/clothes/shoes, buy goods/ appliances, buy orthopedic appliances, moving home, accommodating house (terrace, closet), , accompany household member to receive medical attention, carry or pick up a household member to work, accompany a household member to a special class or training, caring for sick household member by day or night, carry a household member to a health center, carry a household member to a therapist, prepare home remedies for any household member, general home repair, repairs means of transportation, appliance repair, care for farm animals, milking/shearing/collect eggs, collecting water for the terrain, collecting firewood/mushrooms/herbs, collect flowers and fruits, hunting and fishing for consumption by household members, most orchard activities (sowing, harvesting), charge government subsidies, rental housing formalities, payment basic services, payment formalities, order documents, supervising chores, do household accounts, home security monitoring; supervising home repairs; The following aid for household members who are disabled; care, feeding, grooming, therapies, care at night, giving special meal, take/ accompany therapies or medical services, perform formalities, room cleaning, washing and ironing clothes separately; The following to help to other households: help with unpaid work, caring people.
Childcare	Child feeding, bathing children, play/talk/read stories to children, practices special exercise or therapy for children, attending meetings/festivals/other activities in school, help with homework, carry or pick up a household member to an educational center

Source: Time Use Survey of Ecuador 2012

Appendix I.C: Additional results

Table I.C1. Descriptive statistics

	Peru		Mexico		Ecuador	
VARIABLES	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Woman	0.53	(0.50)	0.54	(0.50)	0.54	(0.50)
Age	40.73	(11.96)	39.24	(11.87)	41.22	(11.99)
Primary education	0.51	(0.50)	0.69	(0.46)	0.67	(0.47)
Secondary education	0.27	(0.44)	0.13	(0.34)	0.19	(0.40)
University education	0.22	(0.42)	0.18	(0.38)	0.14	(0.34)
N adults	2.86	(2.16)	2.89	(2.02)	2.65	(2.14)
N. children 0-4	0.44	(0.68)	0.41	(0.68)	0.43	(0.70)
N. children 5-12	0.76	(0.91)	0.69	(0.92)	0.84	(1.01)
N. children 13-17	0.47	(0.70)	0.43	(0.70)	0.50	(0.76)
N. elderlies 70 or more	0.11	(0.35)	0.10	(0.34)	0.09	(0.32)
Presence of partner	0.72	(0.45)	0.71	(0.45)	0.72	(0.45)
N. men working	1.24	(0.80)	1.15	(0.83)	1.08	(0.75)
N. women working	0.75	(0.78)	0.65	(0.78)	0.53	(0.68)
Rural área	0.31	(0.46)	0.25	(0.43)	0.48	(0.50)
Indigenous	0.18	(0.39)	0.08	(0.28)	0.10	(0.30)
Observations	7243		28480		23345	

Note: Standard deviations in parentheses. The sample is restricted to individuals between 21 and 65, who are not students and are not retired. Primary education is equivalent to less than a high school degree, secondary education is equivalent to high school degree, and university education is equivalent to more than a high school degree.

Table I.C2. Gender differences in the time devoted to paid work, unpaid work, child care and total work (individuals with a partner)

Hours per week	Women		Men		
	Mean	SD	Mean	SD	Difference
Paidwork					
Peru	16.75	(22.47)	51.48	(18.84)	-34.73***
Mexico	14.96	(22.81)	49.07	(23.32)	-34.11***
Ecuador	14.88	(22.39)	49.16	(15.89)	-34.28***
Unpaid work					
Peru	44.57	(19.21)	13.15	(10.50)	31.42***
Mexico	43.49	(20.25)	11.87	(14.10)	31.62***
Ecuador	43.24	(21.64)	8.48	(9.88)	34.76***
Childcare					
Peru	6.86	(8.49)	2.48	(3.34)	4.38***
Mexico	7.14	(9.24)	2.05	(3.88)	5.09***
Ecuador	7.77	(8.90)	1.94	(3.84)	5.83***
Total work					
Peru	68.18	(18.98)	67.11	(16.84)	1.07**
Mexico	65.59	(26.83)	63.00	(22.42)	2.59***
Ecuador	65.89	(28.93)	59.57	(17.44)	6.31***
Observations	21624		20437		

Note: Standard deviations in parentheses. The sample is restricted to individuals between 21 and 65, who are not students and are not retired. Paid work, unpaid work, child care and total work are measured in hours per week. Difference between genders calculated as the time devoted to paid work, unpaid work, child care, and total work by women, less time spent by men in these activities. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Demographic weights by Katz and Murphy (1992). Ecuador considered as reference country.

Table I.C3. Gender differences in the time devoted to paid work, unpaid work, child care and total work (individuals without a partner)

Hours per week	Women		Men		
	Mean	SD	Mean	SD	Difference
Paid work					
Peru	30.11	(25.52)	45.43	(22.40)	-15.32***
Mexico	31.21	(26.79)	43.75	(25.30)	-12.54***
Ecuador	30.61	(24.42)	43.95	(19.47)	-13.34***
Unpaid work					
Peru	33.44	(17.28)	17.24	(14.47)	16.20***
Mexico	30.80	(19.99)	13.99	(14.98)	16.81***
Ecuador	32.68	(20.66)	13.46	(13.99)	19.22***
Child care					
Peru	3.74	(6.33)	0.73	(2.19)	3.00***
Mexico	3.37	(6.30)	0.39	(1.70)	2.97***
Ecuador	4.68	(7.41)	0.66	(2.42)	4.01***
Total work					
Peru	67.28	(21.59)	63.40	(20.78)	3.88***
Mexico	65.38	(28.36)	58.13	(24.58)	7.25***
Ecuador	67.96	(29.57)	58.07	(20.91)	9.89***
Observations	10064		6943		

Note: Standard deviations in parentheses. The sample is restricted to individuals between 21 and 65, who are not students and are not retired. Paid work, unpaid work, child care and total work are measured in hours per week. Difference between genders calculated as the time devoted to paid work, unpaid work, child care, and total work by women, less time spent by men in these activities. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Demographic weights by Katz and Murphy (1992). Ecuador considered as reference country.

Table I.C4. Gender differences in the time devoted to paid work, unpaid work, child care and total work (considering the presence of children under 18)

Hours per week	Women		Men		
	Mean	SD	Mean	SD	Difference
Paidwork					
Peru	20.19	(23.91)	50.72	(19.27)	-30.53***
Mexico	19.92	(25.19)	48.97	(23.54)	-29.06***
Ecuador	19.30	(24.11)	48.78	(16.56)	-29.47***
Unpaid work					
Peru	41.04	(18.99)	13.27	(11.12)	27.77***
Mexico	40.30	(20.96)	11.69	(13.85)	28.61***
Ecuador	40.48	(21.72)	8.57	(10.49)	31.90***
Child care					
Peru	7.48	(8.33)	2.83	(3.44)	4.65***
Mexico	7.64	(9.05)	2.31	(4.02)	5.33***
Ecuador	8.67	(8.82)	2.25	(4.05)	6.42***
Total work					
Peru	68.71	(19.62)	66.82	(16.82)	1.89***
Mexico	67.86	(27.13)	62.98	(22.58)	4.88***
Ecuador	68.46	(29.23)	59.60	(17.98)	8.85***
Observations	23725		19177		

Note: Standard deviations in parentheses. The sample is restricted to individuals between 21 and 65, who are not students and are not retired. Paid work, unpaid work, child care and total work are measured in hours per week. Difference between genders calculated as the time devoted to paid work, unpaid work, child care, and total work by women, less time spent by men in these activities. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Demographic weights by Katz and Murphy (1992). Ecuador considered as reference country.

Table I.C5.   Gender differences in the time devoted to paid work, unpaid work, child care and total work (considering the non-presence of children under 18)

Hours per week	Women		Men		
	Mean	SD	Mean	SD	Difference
Paid work					
Peru	24.30	(25.49)	48.23	(21.43)	-23.93***
Mexico	21.37	(25.85)	44.86	(24.59)	-23.49***
Ecuador	22.42	(24.44)	45.67	(17.75)	-23.25***
Unpaid work					
Peru	40.66	(20.46)	16.42	(12.82)	24.24***
Mexico	36.16	(20.95)	14.12	(15.38)	22.04***
Ecuador	37.49	(22.34)	12.53	(12.43)	24.96***
Total work					
Peru	64.96	(20.46)	64.65	(20.51)	0.31
Mexico	57.53	(26.55)	58.98	(23.93)	-1.45***
Ecuador	59.92	(27.91)	58.20	(19.20)	1.71***
Observations	7963		8203		

Note: Standard deviations in parentheses. The sample is restricted to individuals between 21 and 65, who are not students and are not retired. Paid work, unpaid work, child care and total work are measured in hours per week. Difference between genders calculated as the time devoted to paid work, unpaid work, child care, and total work by women, less time spent by men in these activities. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Demographic weights by Katz and Murphy (1992). Ecuador considered as reference country.

Table I.C6. Gender differences in the time devoted to paid work, unpaid work, child care and total work (considering the fact that the men of the household are participate in labor market and the women of the household are not participate in labor market)

Hours per week	Women		Men		
	Mean	SD	Mean	SD	Difference
Paid work					
Peru	0.00	(0.00)	50.67	(17.68)	-50.67***
Mexico	0.00	(0.00)	51.11	(20.88)	-51.11***
Ecuador	0.00	(0.00)	48.62	(15.74)	-48.62***
Unpaid work					
Peru	53.67	(19.34)	15.26	(11.75)	38.41***
Mexico	47.12	(20.34)	11.00	(12.12)	36.12***
Ecuador	46.04	(22.36)	9.64	(10.95)	36.41***
Child care					
Peru	7.84	(9.25)	2.18	(3.33)	5.66***
Mexico	7.92	(9.68)	1.56	(3.48)	6.36***
Ecuador	8.33	(9.10)	1.49	(3.37)	6.84***
Total work					
Peru	61.51	(18.99)	68.11	(15.96)	-6.60***
Mexico	55.04	(23.10)	63.67	(21.42)	-8.63***
Ecuador	54.38	(24.79)	59.75	(17.62)	-5.38***
Observations	11483		15596		

Note: Standard deviations in parentheses. The sample is restricted to individuals between 21 and 65, who are not students and are not retired. Paid work, unpaid work, child care and total work are measured in hours per week. Difference between genders calculated as the time devoted to paid work, unpaid work, child care, and total work by women, less time spent by men in these activities. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Demographic weights by Katz and Murphy (1992). Ecuador considered as reference country.

Table I.C7. Gender differences in the time devoted to paid work, unpaid work, child care and total work (considering the fact that the men and the women of the household are participate in labor market)

Hours per week	Women		Men		
	Mean	SD	Mean	SD	Difference
Paid work					
Peru	38.28	(20.01)	53.59	(15.66)	-15.31***
Mexico	43.42	(19.19)	53.94	(17.62)	-10.52***
Ecuador	43.36	(16.28)	49.95	(14.01)	-6.59***
Unpaid work					
Peru	33.01	(14.79)	13.00	(9.48)	20.01***
Mexico	31.55	(18.34)	9.94	(9.87)	21.61***
Ecuador	33.87	(19.71)	8.86	(9.71)	25.01***
Childcare					
Peru	4.56	(6.66)	2.09	(3.21)	2.48***
Mexico	4.81	(7.48)	1.65	(3.49)	3.16***
Ecuador	5.71	(7.98)	1.63	(3.57)	4.08***
Total work					
Peru	75.85	(16.46)	68.68	(15.03)	7.17***
Mexico	79.78	(24.26)	65.53	(19.60)	14.25***
Ecuador	82.95	(25.65)	60.45	(16.82)	22.50***
Observations	14236		24372		

Note: Standard deviations in parentheses. The sample is restricted to individuals between 21 and 65, who are not students and are not retired. Paid work, unpaid work, child care and total work are measured in hours per week. Difference between genders calculated as the time devoted to paid work, unpaid work, child care, and total work by women, less time spent by men in these activities. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Demographic weights by Katz and Murphy (1992). Ecuador considered as reference country.

Table I.C8. Gender differences in the time devoted to paid work, unpaid work, child care and total work (considering the fact that the men and the women of the household are participate in labor market and are employed workers)

Hours per week	Women		Men		Difference
	Mean	SD	Mean	SD	
Paid work					
Peru	43.88	(18.37)	54.94	(15.82)	-11.06***
Mexico	45.92	(17.13)	54.91	(16.82)	-8.99***
Ecuador	45.86	(12.90)	50.67	(13.06)	-4.80***
Unpaid work					
Peru	27.36	(13.81)	11.40	(8.63)	15.95***
Mexico	28.73	(17.28)	9.16	(9.09)	19.56***
Ecuador	28.40	(17.91)	7.62	(8.69)	20.78***
Childcare					
Peru	4.23	(6.02)	2.01	(3.07)	2.22***
Mexico	4.72	(7.23)	1.70	(3.53)	3.02***
Ecuador	5.66	(7.78)	1.69	(3.59)	3.96***
Total work					
Peru	75.47	(15.58)	68.35	(15.32)	7.12***
Mexico	79.36	(22.82)	65.76	(18.69)	13.60***
Ecuador	79.92	(22.62)	59.99	(15.65)	19.93***
Observations	8537		16237		

Note: Standard deviations in parentheses. The sample is restricted to individuals between 21 and 65, who are not students and are not retired. Paid work, unpaid work, child care and total work are measured in hours per week. Difference between genders calculated as the time devoted to paid work, unpaid work, child care, and total work by women, less time spent by men in these activities. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Demographic weights by Katz and Murphy (1992). Ecuador considered as reference country.

Table I.C9. Gender differences in the time devoted to paid work, unpaid work, child care and total work (considering the fact that the men and the women of the household are participate in labor market and are self-employed workers)

Hours per week	Women		Men		
	Mean	SD	Mean	SD	Difference
Paid work					
Peru	34.54	(20.19)	52.26	(15.38)	-17.71***
Mexico	37.30	(22.34)	51.33	(19.38)	-14.03***
Ecuador	40.94	(18.67)	48.83	(15.30)	-7.89***
Unpaid work					
Peru	36.78	(14.21)	14.59	(10.01)	22.19***
Mexico	38.48	(19.03)	12.06	(11.46)	26.42***
Ecuador	39.17	(19.92)	10.80	(10.84)	28.37***
Childcare					
Peru	4.79	(7.04)	2.17	(3.34)	2.62***
Mexico	5.03	(8.04)	1.52	(3.36)	3.51***
Ecuador	5.76	(8.16)	1.54	(3.53)	4.22***
Total work					
Peru	76.11	(17.02)	69.02	(14.74)	7.09***
Mexico	80.82	(27.45)	64.91	(21.85)	15.90***
Ecuador	85.87	(27.97)	61.17	(18.49)	24.70***
Observations	5699		8135		

Note: Standard deviations in parentheses. The sample is restricted to individuals between 21 and 65, who are not students and are not retired. Paid work, unpaid work, child care and total work are measured in hours per week. Difference between genders calculated as the time devoted to paid work, unpaid work, child care, and total work by women, less time spent by men in these activities. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Demographic weights by Katz and Murphy (1992). Ecuador considered as reference country.

Table I.C10 OLS regressions on the time devoted to total work, considering age range

VARIABLES	(1) All + country-varying factors (21-29 years)	(2) All + gender norms index + country varying-factors (21-29 years)	(3) All + country-varying factors (30-39 years)	(4) All + gender norms index + country varying-factors (30-39 years)	(5) All + country-varying factors (40-49 years)	(6) All + gender norms index + country varying-factors (40-49 years)	(7) All + country-varying factors (50-59 years)	(8) All + gender norms index + country varying-factors (50-59 years)	(9) All + country-varying factors (60-65 years)	(10) All + gender norms index + country varying-factors (60-65 years)
Woman	3.124***	1.804***	6.884***	5.957***	3.943***	2.410***	0.884*	-1.042*	-0.726	-2.236**
	(0.443)	(0.516)	(0.384)	(0.444)	(0.410)	(0.473)	(0.507)	(0.577)	(0.842)	(0.938)
Primary education	-2.678***	-2.584***	-2.475***	-2.428***	-2.454***	-2.400***	-2.475***	-2.483***	-1.931	-1.925
	(0.525)	(0.525)	(0.496)	(0.496)	(0.544)	(0.544)	(0.849)	(0.848)	(1.844)	(1.840)
University education	-3.821***	-3.823***	-1.161**	-1.172**	0.173	0.145	0.829	0.757	1.343	1.363
	(0.649)	(0.649)	(0.586)	(0.586)	(0.643)	(0.643)	(0.987)	(0.987)	(2.078)	(2.073)
Age	6.971***	6.871***	2.541	2.578	4.856**	4.939**	-0.219	-0.284	12.76	13.15
	(1.797)	(1.795)	(1.684)	(1.683)	(2.324)	(2.320)	(3.534)	(3.529)	(18.58)	(18.56)
Age squared	-12.63***	-12.44***	-3.306	-3.360	-5.698**	-5.796**	-0.345	-0.281	-10.83	-11.15
	(3.581)	(3.576)	(2.440)	(2.439)	(2.617)	(2.612)	(3.256)	(3.251)	(14.88)	(14.87)
N. adults	-6.424***	-6.392***	-6.696***	-6.678***	-4.170***	-4.134***	-4.023***	-3.997***	-4.578***	-4.561***
	(0.237)	(0.237)	(0.247)	(0.247)	(0.216)	(0.216)	(0.279)	(0.278)	(0.479)	(0.479)
N. children 0-4	3.009***	3.045***	3.712***	3.737***	0.894**	0.897**	0.0813	0.141	0.856	0.881
	(0.286)	(0.286)	(0.280)	(0.280)	(0.352)	(0.352)	(0.488)	(0.489)	(0.924)	(0.923)
N. children 5-12	1.556***	1.589***	1.403***	1.408***	1.172***	1.174***	0.290	0.251	-0.649	-0.616
	(0.253)	(0.253)	(0.194)	(0.194)	(0.222)	(0.222)	(0.322)	(0.323)	(0.667)	(0.667)
N. children 13-17	-2.172***	-2.173***	-1.132***	-1.124***	-0.339	-0.364	-0.204	-0.235	-2.038***	-2.078***
	(0.392)	(0.391)	(0.265)	(0.265)	(0.255)	(0.255)	(0.364)	(0.364)	(0.755)	(0.755)
Presence of partner	3.292***	3.269***	-1.197**	-1.197**	-1.797***	-1.823***	-1.158*	-1.170*	0.620	0.641
	(0.513)	(0.513)	(0.484)	(0.483)	(0.514)	(0.513)	(0.634)	(0.633)	(0.934)	(0.933)
N. men working	5.784***	5.782***	5.693***	5.714***	3.414***	3.453***	3.498***	3.516***	6.701***	6.718***
	(0.362)	(0.361)	(0.399)	(0.398)	(0.348)	(0.348)	(0.408)	(0.408)	(0.684)	(0.684)
N. women working	9.429***	9.316***	10.41***	10.34***	9.063***	8.962***	8.911***	8.795***	9.421***	9.325***
	(0.321)	(0.322)	(0.319)	(0.320)	(0.315)	(0.316)	(0.386)	(0.386)	(0.643)	(0.643)
Rural area	2.250***	1.991***	0.992**	0.784*	0.764*	0.405	3.219***	2.768***	4.870***	4.524***
	(0.466)	(0.466)	(0.422)	(0.426)	(0.460)	(0.463)	(0.571)	(0.578)	(0.889)	(0.895)
Indigenous	2.945***	2.487***	2.704***	2.403***	4.373***	3.896***	3.954***	3.553***	6.007***	5.678***
	(0.754)	(0.763)	(0.657)	(0.663)	(0.700)	(0.706)	(0.834)	(0.836)	(1.300)	(1.302)
GDP per capita growth	4.779**	4.207**	5.168***	4.689***	4.580**	3.757**	2.231	1.204	2.049	1.198
	(1.862)	(1.867)	(1.656)	(1.661)	(1.889)	(1.896)	(2.366)	(2.373)	(4.042)	(4.054)

Table I.C10 (continued).

VARIABLES	(1) All + country- varying factors (21-29 years)	(2) All + gender norms index + country varying- factors (21- 29 years)	(3) All + country- varying factors (30-39 years)	(4) All + gender norms index + country varying- factors (30- 39 years)	(5) All + country- varying factors (40-49 years)	(6) All + gender norms index + country varying- factors (40- 49 years)	(7) All + country- varying factors (50-59 years)	(8) All + gender norms index + country varying- factors (50- 59 years)	(9) All + country- varying factors (60-65 years)	(10) All + gender norms index + country varying- factors (60- 65 years)
Female labor force participation	5.291***	4.462***	5.949***	5.304***	4.529***	3.442**	2.438	1.026	0.692	-0.400
	(1.715)	(1.723)	(1.523)	(1.531)	(1.720)	(1.731)	(2.164)	(2.178)	(3.605)	(3.621)
Masculinity rate (sex-ratio)	0.242	0.119	0.584**	0.486**	0.251	0.100	0.0695	-0.136	-0.300	-0.457
	(0.275)	(0.276)	(0.240)	(0.241)	(0.273)	(0.274)	(0.340)	(0.341)	(0.573)	(0.576)
Fertiliy rate	-0.857	-0.140	0.607	1.070	1.761*	2.518**	5.683***	6.480***	3.953**	4.451**
	(1.133)	(1.143)	(0.967)	(0.976)	(1.058)	(1.066)	(1.385)	(1.389)	(2.005)	(2.017)
Population aged 65 and above	0.897***	1.010***	1.404***	1.478***	1.194***	1.342***	0.819***	0.971***	1.182***	1.335***
	(0.229)	(0.233)	(0.202)	(0.206)	(0.213)	(0.218)	(0.252)	(0.257)	(0.391)	(0.401)
Gender norms index	-	11.28***	-	7.954***	-	12.97***	-	16.40***	-	12.93***
	-	(2.320)	-	(1.962)	-	(2.098)	-	(2.520)	-	(3.971)
Peru	-69.31***	-59.09**	-79.06***	-71.04***	-59.95**	-46.36*	-29.61	-12.12	-5.811	7.865
	(23.52)	(23.61)	(20.87)	(20.97)	(23.61)	(23.74)	(29.68)	(29.83)	(49.62)	(49.81)
Mexico	90.41***	77.66***	100.8***	90.58***	79.29***	62.17**	41.65	19.54	17.44	0.0775
	(29.65)	(29.77)	(26.24)	(26.35)	(29.79)	(29.96)	(37.32)	(37.52)	(63.19)	(63.45)
Constant	-366.5***	-339.8***	-392.9***	-370.8***	-337.3**	-301.0**	-82.56	-28.60	-352.5	-324.7
	(125.2)	(125.3)	(111.6)	(111.7)	(132.9)	(133.0)	(181.2)	(181.4)	(634.7)	(634.0)
R-squared	0.153	0.154	0.142	0.142	0.104	0.106	0.094	0.097	0.106	0.108
Observations	13,651	13,651	16,386	16,386	14,160	14,160	10,527	10,527	4,344	4,344

Note: Robust standard errors in parentheses. The sample is restricted to individuals between 21 and 65 who are not students and not retired. Total work is measured in hours per week (see Appendix I.B for a description of the activities included in the category). Primary education is equivalent to less than a high school degree, secondary education is equivalent to high school degree, and university education is equivalent to more than a high school degree. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Demographic weights by Katz and Murphy (1992), Ecuador considered as reference country.

Table I.C11. OLS regressions on the time devoted to total work, robustness tests

VARIABLES	(1) All + country varying-factors	(2) All + Gender norms+ country varying-factors	(3) All + Gender norms (without demographic weights) + country varying-factors	(4) All + Gender norms (pca by countries) + country varying-factors	(5) All + Gender norms (pca by regions) + country varying-factors	(6) All + Gender norms (pca without attitude 1) + country varying-factors	(7) All + Gender norms (pca without attitude 5) + country varying-factors
Woman	3.903***	2.509***	2.427***	2.504***	2.687***	2.189***	2.349***
	(0.207)	(0.239)	(0.231)	(0.238)	(0.249)	(0.248)	(0.250)
Primary education	-2.633***	-2.572***	-2.152***	-2.570***	-2.593***	-2.564***	-2.577***
	(0.281)	(0.281)	(0.263)	(0.281)	(0.281)	(0.281)	(0.281)
University education	-1.042***	-1.061***	-1.170***	-1.063***	-1.045***	-1.067***	-1.055***
	(0.334)	(0.334)	(0.309)	(0.334)	(0.334)	(0.334)	(0.334)
Age	1.676***	1.677***	1.709***	1.677***	1.675***	1.678***	1.676***
	(0.0638)	(0.0637)	(0.0612)	(0.0637)	(0.0637)	(0.0637)	(0.0637)
Age squared	-2.078***	-2.079***	-2.097***	-2.080***	-2.077***	-2.080***	-2.079***
	(0.0760)	(0.0759)	(0.0729)	(0.0759)	(0.0759)	(0.0759)	(0.0759)
N. adults	-5.532***	-5.505***	-5.572***	-5.505***	-5.515***	-5.503***	-5.508***
	(0.115)	(0.115)	(0.110)	(0.115)	(0.115)	(0.115)	(0.115)
N. children 0-4	2.497***	2.525***	2.815***	2.526***	2.518***	2.529***	2.523***
	(0.159)	(0.159)	(0.154)	(0.159)	(0.159)	(0.159)	(0.159)
N. children 5-12	1.016***	1.024***	1.160***	1.023***	1.024***	1.024***	1.024***
	(0.113)	(0.113)	(0.109)	(0.113)	(0.113)	(0.113)	(0.113)
N. children 13-17	-1.073***	-1.082***	-1.090***	-1.082***	-1.078***	-1.083***	-1.081***
	(0.144)	(0.144)	(0.139)	(0.144)	(0.144)	(0.144)	(0.144)
Presence of partner	0.958***	0.950***	1.041***	0.948***	0.958***	0.944***	0.948***
	(0.246)	(0.245)	(0.233)	(0.245)	(0.246)	(0.245)	(0.245)
N. men working	4.673***	4.691***	4.814***	4.692***	4.684***	4.694***	4.689***
	(0.183)	(0.183)	(0.174)	(0.183)	(0.183)	(0.183)	(0.183)
N. women working	9.386***	9.283***	9.297***	9.281***	9.317***	9.272***	9.292***
	(0.162)	(0.162)	(0.155)	(0.162)	(0.162)	(0.162)	(0.162)
Rural area	1.943***	1.629***	1.505***	1.621***	1.739***	1.591***	1.656***
	(0.231)	(0.232)	(0.225)	(0.232)	(0.232)	(0.232)	(0.232)
Indigenous	3.863***	3.453***	3.249***	3.445***	3.597***	3.403***	3.494***
	(0.355)	(0.358)	(0.351)	(0.358)	(0.357)	(0.358)	(0.358)
GDP per capita growth	4.234***	3.518***	3.898***	3.574***	3.698***	2.855***	3.823***
	(0.946)	(0.949)	(0.885)	(0.948)	(0.948)	(0.954)	(0.947)
Female labor force participation	4.347***	3.374***	3.475***	3.402***	3.459***	2.950***	3.520***
	(0.865)	(0.870)	(0.809)	(0.870)	(0.871)	(0.874)	(0.869)
Masculinity rate (sex-ratio)	0.264*	0.122	0.209	0.124	0.0366	0.0520	0.114
	(0.137)	(0.137)	(0.128)	(0.137)	(0.139)	(0.138)	(0.137)
Fertiliy rate	1.565***	2.232***	1.397***	2.304***	2.555***	2.156***	2.404***
	(0.542)	(0.546)	(0.503)	(0.546)	(0.555)	(0.544)	(0.548)
Population aged 65 and above	1.152***	1.274***	1.285***	1.297***	1.022***	1.393***	1.264***
	(0.107)	(0.110)	(0.110)	(0.110)	(0.106)	(0.112)	(0.109)
Gender norms index	-	11.92***	11.54***	11.84***	9.940***	12.09***	11.32***
	-	(1.069)	(1.053)	(1.048)	(1.160)	(0.993)	(1.058)
Peru	-56.90***	-44.81***	-46.72***	-45.30***	-46.13***	-38.11***	-47.01***
	(11.87)	(11.92)	(11.09)	(11.92)	(11.94)	(11.98)	(11.91)
Mexico	75.54***	60.30***	63.42***	60.98***	61.59***	52.28***	63.64***
	(14.96)	(15.03)	(13.99)	(15.02)	(15.05)	(15.10)	(15.01)
Constant	-256.7***	-222.8***	-236.7***	-224.9***	-213.1***	-192.2***	-230.4***
	(61.78)	(61.87)	(57.57)	(61.85)	(61.97)	(62.03)	(61.83)
R-squared	0.130	0.132	0.131	0.132	0.131	0.132	0.132
Observations	59,068	59,068	59,068	59,068	59,068	59,068	59,068

Note: Robust standard errors in parentheses. The sample is restricted to individuals between 21 and 65 who are not students and not retired. Total work is measured in hours per week (see Online Appendix I.B for a description of the activities included in the category). First, we exclude the demographic weights in our estimations. Second, we compute the gender norms index based on the PCA technique, where we apply weights to each country separately. Third, we compute the gender norms index with weights applied to each region of each country separately, as there may be cross-regional variations in the responses to these questions within each country. We also use an alternative neutrality index, where we exclude one question at a time in the construction of the gender norms index, to determine whether that question makes a difference when used to build the index. In particular, we exclude question 1 (attitude 1) or question 5 (attitude 5) in the computation of the gender norms index. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Demographic weights by Katz and Murphy (1992), Ecuador considered as reference country.

II. Chapter II: Self-employed and employed mothers in Latin American families: are there differences in paid work, unpaid work, and child care?

II.1 Introduction

In this chapter, we analyze the differences in the time devoted by employed and self-employed mothers in paid work, unpaid work, and child care, in four Latin American countries. In these countries, one of the most important advances during recent decades has been the increase of women in the labor market, reflected in an increase in the female labor force participation rate, which has grown from 40.5% in 1990 to 54.1% in 2014 (World Bank, 2017). But women continue to be comparatively more vulnerable to unemployment than men, with women concentrated in precarious, low paid, and low productivity jobs (Heller, 2010; Mateo Diaz and Rodriguez-Chamussy, 2013, 2016). Furthermore, women still devote comparatively more time to unpaid work and caring, compared with men (Gershuny, 2000; Newman, 2002; Medeiros et al., 2007; Esplen, 2009; Anxo et al., 2011; Öun, 2013; Canelas and Salazar, 2014; Campaña et al., 2018), which creates what for women has been called the "second shift" or "double-burden" (Hochschild and Machung, 1989; Schor, 1991; Hochschild, 1997; Gimenez-Nadal and Sevilla, 2011) and affects their daily happiness (Kahneman et al., 2004; Kahneman and Krueger, 2006; Krueger, 2007; Gimenez-Nadal and Molina, 2015) and their heath.[18] Such negative outcomes may have a negative influence on workplace performance (Netemeyer et al., 1996; Kossek and Ozeki, 1999; Allen et al., 2000; Grzywacz and Bass, 2003; Byron, 2005; Mesmer-Margnus and Viswesvaran, 2005a, b).

Several authors have proposed self-employment as a strategy to reduce the conflict between women's work and family responsibilities (Stephens and Feldman, 1997; Arai, 2000; Georgellis and Wall, 2000; Walker and Webster, 2007; Kirkwood and Tootell,

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[18] As argued in Montaño (2010), there is a very marked division of labor between men and women in Latin American countries, reflected in a disproportionate unpaid workload for women in the household. When women face the double burden (or the second shift), they are more likely to face psychological stress and even see themselves as being less healthy than their colleagues who are not in this situation (Väänänen et al., 2005).

2008). Self-employment may allow for better control over women's own working time, helping to reduce the work-family conflict (Arai, 2000; Wellington, 2006; Beutell, 2007; Hyytinen and Ruskanen, 2007; Dawson et al., 2009; Gimenez-Nadal et al., 2012). Also, mothers may choose to be self-employed to have greater flexibility in working hours, allowing them to spend more time with their children (Presser, 1989; Conelly, 1992; Loscocoo, 1997; Caputo and Dolinsky, 1998; Boden, 1999; Hundley, 2000; Lombard, 2007; Arai, 2000; Gimenez-Nadal et al., 2012; Johansson-Sevä and Öun, 2015). Self-employed workers show different patterns of behavior with respect to time spent in different activities, compared to their salaried counterparts (Gimenez-Nadal et al., 2012; Johansson- Sevä and Öun, 2015; Campaña et al., 2016). This solution to the "second shift" may be especially important in Latin-American countries, where the "second shift" for women imposes high constraints on women's time (Campaña et al., 2018) and where the attachment of women to the labour market may be lower in comparison to developed countries, given the worse conditions and expectations of women regarding their jobs.

Within this framework, we analyze the time that employed and self-employed mothers in Latin American countries devote to paid work, unpaid work, and child care. To that end, we use data from time-use surveys for Mexico (2009), Peru (2010), Ecuador (2012), and Colombia (2012). In all four countries, we find that self-employed mothers devote less time to paid work, and more time to unpaid work and child care, compared to employed mothers. These differences are present even when controlling for socio-demographic and occupation variables, indicating that the differences between both groups are not due to observed characteristics, including differences in the type of work. These results are consistent with prior studies showing that self-employed mothers in developed countries use their time differently than do their employed counterparts, and which point toward self-employment as an option to improve the work-life balance of women (DeMartino and Barbato, 2003; Lombard 2007; Gimenez-Nadal et al., 2012). More importantly, our results are also consistent with prior results showing a positive relationship between self-employment and childcare time (Conelly, 1992; Edwards and Field-Hendrey, 1996; Caputo and Dolinsky, 1998; Boden, 1999).

Given the importance of child care time in the development of children (Leibowitz, 1972, 1974, 1977; Hsin and Felfe, 2014, Kalenkoski and Foster, 2008, Sayer et al., 2004), we focus on the activities aimed at increasing the human capital of children (e.g., helping

children with homework, reading stories to children), which we call "educational child care". Our results show that self-employed mothers from Mexico, Ecuador, and Colombia dedicate more time to educational child care compared to employed mothers. In addition, we find differences in the time devoted to educational child care among self-employed and employed mothers, according to the level of education. We analyze the possible explanations for these differences.

Our contribution to the literature is threefold. First, we contribute to the analysis of differences between self-employed and employed mothers in the uses of time, in an attempt to reconcile self-employment as a strategy to deal with women's labor and household demands. Our results are similar to those found in developed countries (MacDonald et al., 2005; Gimenez-Nadal et al., 2012, Johansson-Sevä and Öun, 2015, Campaña et al., 2016). Second, we analyze data from four countries with different welfare regimes, in an attempt to extract common patterns in the time devoted to paid work, unpaid work, and childcare. Third, we contribute to the analysis of educational child care in Latin American countries, adding to the existing literature (Campaña et al., 2017). Despite research showing differences in the time spent on educational child care according to the characteristics of the mothers, such as education (Guryan et al., 2008, Gimenez-Nadal and Molina, 2013, Campaña et al., 2017), no prior research has focused on self-employment.

The rest of the chapter is organized as follows. Section II.2 presents the theoretical framework. Section II. 3 presents the data and the descriptive evidence. Section II.4 explains our econometric strategy. Section II.5 presents the main results and Section II.6 presents our main conclusions.

II.2 Theoretical framework

For the theoretical framework of this chapter, we rely on the model of Wellington (2006), who assumes that women with children maximize the following utility function: $U = f(I_{emp}, I_{self}, H_c, other\ incomes, preferences)$ where I_{emp} is the expected income for an employed mother, I_{self} is the expected income for a self-employed mother, and H_c, are hours dedicated to child care.

The income for self-employed and employed mothers is simply the respective salary multiplied by the hours worked. In this model, it is assumed that the wage rate is the net cost of formal child care service and, assuming that self-employed mothers can combine some child care activities with their paid work, the costs of child care are greater for an employed mother. For a mother who works in a salaried job (employed mother), time devoted to a child is time with no salary, resulting in a one-to-one compensation between time with the child and the time in market work. However, self-employed mothers can, to a certain extent, better combine time with a child and paid work (Boden, 1996, 1999; Connelly, 1992; Edwards and Field-Hendrey, 2002; MacPherson, 1988). Hypotheses are shown in the following equations:

(1) $I_{emp} = w_{emp} * H_{emp}$

(2) $I_{self} = W_{self} * H_{self}$

(3) $H_T = H_{emp} + H_c$ for employed mothers

(4) $H_T = H_{nc} + H_c$ for self-employed mothers

(5) $H_{self} = H_{nc} + \alpha H_c$ for self-employed mothers

Where w_{emp} is the net wage rate of child care costs for employed mothers; H_{emp} are the hours worked by the employed mothers; W_{self} is the net wage rate of child care costs for self-employed mothers; H_{self} are the hours worked by the self-employed mothers; H_T is the total hours available (for self-employed and employed mothers) H_{nc} are hours worked as self-employed mother without a child, H_c are hours dedicated to a child (for self-employed and employed mothers); and α, $(0<\alpha<1)$ is the proportion of hours with a child that a self-employed mother can produce together with the market work.

If we rearrange equation (3) and replace it in equation (1), we obtain the family budget constraint for a salaried woman:

(6) $I_{emp} = w_{emp} * (H_T - H_c)$ for employed mothers

where the opportunity cost of an additional hour for an employed mother with a child is simply the salary rate of the employed mother.

In contrast, to determine the budget constraint of a self-employed mother, we first substitute equation (4) to have H_{nc}:

(7) $H_{nc} = H_T - H_c$

we substitute this expression in equation (5):

(8) $H_{self} = (H_T - H_c) + \alpha H_c$

and this expression is substituted in equation (2):

(9) $I_{self} = W_{self} * H_T - [(1 - \alpha) \, W_{self}]H_c$ for self-employed mothers

Equation (9) shows that if α increases (reflecting an increase in the ability to produce self-employment and dedicate time to a child), the opportunity cost of spending time with a child will decrease. Given that the relative price of spending time with a child while working on a self-employed basis, as compared to working in a salaried job, decreases as α increases, so one would expect women to be more likely to choose to work on their own as α increases. An increase in α will also increase I_{self} (self-employed income) without needing a reduction in hours spent on a child, again making it more likely that women with children will choose to be self-employed.

II.3 Data

We use time use surveys from Mexico (2009), Peru (2010), Ecuador (2012) and Colombia (2012). These are the first time-use surveys in these four countries, since data on their time use was previously available only through other sources, such as integrated household surveys.[19] These surveys include information on individual time use and are representative at the national level and consider urban and rural areas. The targeted population are all members of households, aged 12 and above, for Mexico, Peru, and Ecuador, and aged 10 and above for Colombia. The first three surveys take as reference

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[19] Among time-use surveys in Latin America, there is no common standardized classification of activities across countries, as each country follows a different protocol in the coding of activities, adapting different protocols to its situation. Since most of our analysis is based on the comparison of broad classifications of activities, rather than their detailed disaggregation, we argue as Gimenez-Nadal and Sevilla (2012) that we can draw meaningful comparisons across countries using these surveys.

period the previous week, while for Colombia the reference period is the previous day.[20] The four surveys use a list of pre-coded activities, and individuals record the amount of time devoted to these different activities.[21] Time use surveys have become the typical instrument used to analyze individual time-allocation decisions (Aguiar and Hurst, 2007; Bianchi, 2000; Folbre et al., 2005; Gershuny, 2000; Gimenez-Nadal and Sevilla, 2012; Gimenez-Nadal and Molina, 2015).

Our sample is restricted to employed and self-employed mothers of children under 18, with positive hours of work during the previous week or the previous day. Our final sample is comprised of 3,063 mothers in Mexico, 1,035 mothers in Peru, 3,065 mothers in Ecuador, and 8,273 mothers in Colombia. In terms of self-employment, the proportions are 32% in Mexico, 60% in Peru, 52% in Ecuador, and 42% in Colombia. For the definition of the time devoted to paid work, unpaid work, and child care we follow Aguiar and Hurst (2007) and Gimenez-Nadal and Sevilla (2012). Paid work includes all the time spent working in the paid sector.[22] Unpaid work includes any time spent in the preparation of meals, cleaning, laundry, ironing, dusting, vacuuming, maintenance (including painting and decorating), time spent on the procurement of goods and services (that is, making purchases of groceries, shopping for items for the home), along with time spent on other productive activities at home, such as outdoor cleaning and vehicle repair. Child care includes the time devoted to activities such as breastfeeding, bathing, dressing, and taking a child to the doctor, as well as playing with children, reading stories, attending meetings/support activities and events at school, helping with or supervising homework,

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[20] Following Campaña et al. (2017) the information shown in this thesis chapter for Mexico, Peru and Ecuador is presented in hours per week and the information shown for Colombia is shown in hours per day. The Colombian time use-survey questionnaire is based on a list of daily activities, and the other three time-use surveys are based on a list of weekly activities. Individuals organize their time differently and the information differs when it is obtained from an ordinary day or a weekend (Connelly and Kimmel, 2009). Thus, it would not be correct to multiply by seven the information obtained from the Colombia survey.

[21] The methodologies for the time use surveys used in this paper have been defined by the relevant institutes of statistics in each country: INEGI (National Institute of statistics and geography) in Mexico, INEI (National Institute of Statistics and Informatics) in Peru; INEC (National Institute of statistics and censuses) in Ecuador and DANE (National Administrative Department of statistics) in Colombia. Lists of activities based on the following classifications are used in the data collection: Mexico (CMAUT, Mexican classification of time use activities); Peru (ICATUS, classification international activities of use of time); Ecuador and Colombia (CAUTAL, classification of activities of the use of time for Latin America and the Caribbean).

[22] Following Gimenez-Nadal et al. (2012), we exclude times of commuting to paid work, since some self-employed could carry out their work from home.

and taking to and picking up from school.[23] The time devoted to these different categories is measured in hours per week for Mexico, Peru and Ecuador, and hours per day for Colombia.

II.3.1 *Descriptive statistics*

Table II.1 shows the time devoted to paid work (Column 1), unpaid work (Column 2), and child care (Column 3) by working mothers in the four countries. We observe that self-employed mothers devote less time to paid work, and more time to unpaid work, compared to employed mothers.

Table II.1. Difference between self-employed and employed mothers in the time devoted to paid work, unpaid work, and child care.

	(1)	(2)	(3)
	Paid work	Unpaid work	Child care
Panel A: Mexico			
Self – employed	32.84	42.69	7.40
Employed	39.96	34.98	7.02
Difference	-7.13***	7.71***	0.38
Panel B: Peru			
Self – employed	31.26	37.63	6.57
Employed	37.99	30.24	5.95
Difference	-6.73***	7.39***	0.63
Panel C: Ecuador			
Self – employed	38.22	41.15	8.13
Employed	41.17	33.05	8.28
Difference	-2.95***	8.09***	-0.15
Panel D: Colombia			
Self – employed	4.93	4.28	0.79
Employed	6.07	3.12	0.71
Difference	-1.14***	1.16***	0.08***

Note: Data sources are time-use surveys from Mexico (2009), Peru (2010), Ecuador (2012) and Colombia (2012). The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. This table presents means of time devoted by self-employed and employed mothers to paid work, unpaid work, and child care (See Appendix II.A for a description of all the activities included in the four categories). Time devoted to the activities is measured in hours per week (Mexico, Peru and Ecuador) and hours per day (Colombia). Difference employed-self-employed mothers indicates the differences between the two groups in the time devoted to paid work, unpaid work and child care. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

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[23] Kahneman and Krueger (2006) and Krueger (2007) show that the time parents spend on children is an enjoyable activity that offers a different level of (experienced) utility compared to unpaid work, indicating that unpaid work and child care have a different meaning. Therefore, it is necessary that these activities are treated separately. See Appendix II.A for a description of all the activities included in the three categories.

In particular, we observe that self-employed mothers devote, relative to employed mothers, 7.13, 6.73, 2.95 and 1.14 fewer hours to paid work in Mexico, Peru, Ecuador (hours per week in the three countries) and Colombia (hours per day), respectively, and 7.71, 7.39, 8.09 and 1.16 more hours to unpaid work in Mexico, Peru, Ecuador (hours per week in the four countries) and Colombia (hours per day). Based on a t-type test, all these differences are statistically significant at the 99 percent confidence level, given that the p-value of the test yields values lower than .01 in all cases. In contrast, the difference in the time devoted to child care between employed and self-employed mothers is statististically significant only in Colombia, with self-employed mothers devoting 0.08 more hours per day to child care than do their employed counterparts.

This evidence indicates that self-employed mothers devote comparatively more time to unpaid work, and less time to paid work, despite that no differences are found in the time devoted to child care (except in Colombia). Table II.2 shows the time devoted to paid work (Columns 1,4 and 7), unpaid work (Columns 2,5 and 8), and child care (Columns 3, 6, 9) by working mothers in the four countries, considering the age of their children. Following Campaña et al. (2017), we consider three groups: 0–4 years, 5–12 years, and 13-17. It is important to analyze differences according to the age range of the children, because the demands on mothers change with the age of children. While children are young, mothers need to invest large amounts of time in basic activities such as bathing, dressing, and taking them to the doctor, but when children are older, mothers may need to invest more time in activities like reading and teaching (Silver 2000; Miller and Mulvey, 2000).

We observe that the largest differences between self-employed and employed mothers in the time devoted to paid work, unpaid work, and child care are found in mothers who have children between 0 and 4 years old. In the three groups analyzed, self-employed mothers devoted less time to paid work and more time to unpaid work and child care. With respect to child care, self-employed mothers with children between 0 and 4 years old devote, relative to employed mothers, 2.51, 1.53, and 0.35 more hours to this activity in Mexico and Peru (hours per week) and Colombia (hours per day), respectively. Self-employed mothers with children between 5 and 12 years old devote, relative to employed mothers, 1.22, 0.77, and 0.17 more hours to child care in Mexico and Ecuador (hours per week) and Colombia (hours per day) respectively.

Table II.2. Difference between self-employed and employed mothers in the time devoted to paid work, unpaid work, and child care considering children age range

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Paid work	Unpaid work	Child care	Paid work	Unpaid work	Child care	Paid work	Unpaid work	Child care
	Age range 0-4			Age range 5-12			Age range 13-17		
Panel A: Mexico									
Self – employed	29.22	44.23	16.15	31.91	43.64	9.09	34.25	43.54	4.38
Employed	39.45	34.25	13.64	39.28	36.12	7.86	40.61	35.79	3.93
Difference	-10.23***	9.98***	2.51***	-7.37***	7.52***	1.22***	-6.36***	7.74***	0.45
Panel B: Peru									
Self – employed	26.20	39.16	13.05	30.51	38.79	7.46	32.58	37.37	4.32
Employed	34.26	30.75	11.52	37.63	31.43	6.75	38.54	29.75	4.02
Difference	-8.06***	8.41***	1.53*	-7.12***	7.35***	0.71	-5.96***	7.61***	0.30
Panel C: Ecuador									
Self – employed	36.32	43.19	14.78	37.92	42.11	10.00	38.03	40.53	5.70
Employed	40.97	33.19	13.94	40.77	34.16	9.23	41,72	32.53	4.85
Difference	-4.65***	10.00***	0.85	-2.85***	7.95***	0.77**	-3.69***	7.99***	0.86**
Panel D: Colombia									
Self – employed	4.57	4.45	2.02	4.90	4.34	0.82	5.10	4.21	0.40
Employed	5.98	3.12	1.67	6.01	3.20	0.64	6.20	3.14	0.30
Difference	-1.42***	1.32***	0.35***	-1.11***	1.14***	0.17***	-1.10***	1.07***	0.10***

Note: Data sources are time-use surveys from Mexico (2009), Peru (2010), Ecuador (2012) and Colombia (2012). The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. This table presents means of time devoted by self-employed and employed mothers to paid work, unpaid work and child care (See Appendix C for a description of all the activities included in the four categories). Time devoted to the activities is measured in hours per week (Mexico, Peru and Ecuador) and hours per day (Colombia). Difference employed-self-employed mothers indicates the differences between the two groups in the time devoted to paid work, unpaid work, and child care. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Self-employed mothers with children between 13 and 17 years old devote, relative to employed mothers, 0.86 and 0.10 more hours to child care in Ecuador (hours per week) and Colombia (hours per day) respectively. These differences are statistically significant at standard levels.

The results shown in Table II.2 (unlike the results shown in Table II.1) considering the age of children, can begin to support the hypothesis that mothers may choose to be self-employed in order to have greater flexibility in working hours, allowing them to spend more time with their children. From these descriptive results, in the following sections we analyze these relationships, controlling for other factors that may be biasing the afore mentioned differences.

II.4. Econometric strategy

For the time devoted to paid work, unpaid work, and child care, we estimate linear regressions. There may be some controversy regarding the selection of alternative models, such as Tobit models (Tobin, 1958). Gershuny (2012) argues that the MCO models provide accurate estimates of the average times of the activities for samples and subgroups. Frazis and Stewart (2012) argue that linear models are preferred in the analysis of time allocation decisions, while Foster and Kalenkoski (2013) compare the use of linear and Tobit models in the analysis of the time devoted to child care activities, finding that the qualitative conclusions are similar for both estimation methods. Thus, we rely on linear models. We also consider that the time individuals spend in any activity (e.g., paid work) cannot be devoted to any of the other two activities. We cannot use individual time in any specific activity as an explanatory variable of other uses of time, since that would lead to endogeneity problems, and for this reason we estimate a Seemingly Unrelated Regression (SUR) on the time devoted to paid work, unpaid work, and child care.

For a given individual "i" in country "k" (k=1,2,3,4), let PW_{ik}, UW_{ik}, C_{ik}, represent the hours that working mothers report performing paid work, unpaid work, and child care. $Self-employed_{ik}$ takes value "1" if respondent " i " in country "k" is a self-employed mother and "0" otherwise, x_{ik} is a vector of socio-demographic characteristics, and $\varepsilon_{pwik}, \varepsilon_{uwik}, and\ \varepsilon_{cik}$ are the random variables representing unmeasured factors. We then estimate the following equations.

$$PW_{ik} = \alpha_{pw} + \beta_1 Self - employed_{ik} + \beta_2 x_{ik} + \varepsilon_{pwik} \quad (1)$$

$$UW_{ik} = \alpha_{uw} + \beta_1 Self - employed_{ik} + \beta_2 x_{ik} + \varepsilon_{uwik} \quad (2)$$

$$C_{ik} = \alpha_c + \beta_1 Self - employed_{ik} + \beta_2 x_{ik} + \varepsilon_{cik} \quad (3)$$

We allow for correlations in the unobserved determinants of the activities by allowing the error terms to be jointly normally distributed, with no restrictions on the structure of these correlations. This specification accounts for the time constraint that may require individuals to spend more time on one activity and, therefore, less time on another. We additionally assume that the error components are independent across individuals:

$$\begin{pmatrix} \varepsilon_{pwik} \\ \varepsilon_{uwik} \\ \varepsilon_{cik} \end{pmatrix} \sim N \begin{pmatrix} \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix} & \begin{matrix} \sigma^2_{pwik} & \rho_{pwikuwik}\sigma_{pwik}\sigma_{uwik} & \rho_{pwikcik}\sigma_{pwik}\sigma_{cik} \\ \rho_{uwikpwik}\sigma_{uwik}\sigma_{pwik} & \sigma^2_{uwik} & \rho_{uwikcik}\sigma_{uwik}\sigma_{cik} \\ \rho_{cikpwik}\sigma_{cik}\sigma_{pwik} & \rho_{cikuwik}\sigma_{cik}\sigma_{uwik} & \sigma^2_{cik} \end{matrix} \end{pmatrix}$$

The x_{ik} (vector) includes standard household and individual characteristics (Sevilla et al., 2010; Gimenez-Nadal and Molina, 2013; Campaña et al., 2017), such as age, age squared, secondary education (high school degree), and university education (more than high school degree), with primary education (less than high school degree) being the reference category, presence of partner (married/cohabiting), non-labour income (family), the (log) hourly predicted wage rate, the (log) hourly predicted wage rate squared, number of household members, number of children in the household (aged 0 to 4 years, aged 5 to 12 years, aged 13 to 17 years), whether the respondent is indigenous or not, living in a rural area or not, the sector composition in which the mothers work (reference primary sector), and the region of residence of the mothers. See Table II.B1 in the Appendix for summary statistics of the variables in the four countries.

Kalenkoski et al. (2005) and Aguiar and Hurst (2007) show that age and age squared should be considered in order to account for the allocation of time over the life-cycle.

For example, the time spent in child care varies as children grow older, so we must control for age, and we expect an inverted U-shaped effect of age on child care time. Furthermore, older individuals may show higher productivities in unpaid work, given their expertise in those chores. Education is an important factor to consider, given that it may reflect the "shadow price of time" (e.g., opportunity cost of paid work (Becker, 1965). Women with higher studies have been shown to devote more time to child care and paid work (Guryan et al., 2008; Gimenez-Nadal and Sevilla, 2012; Campaña et al., 2017). Regarding the presence of partners, Mateo Díaz and Rodriguez-Chamussy (2016) show that unmarried women have higher labor-participation rates than married women. The presence of working husbands/partners may produce specialization within the household (Becker, 1991), making women devote more time to unpaid work. The number of family members may influence the time devoted to the different activities. For example, the presence of other female relatives in the household increases maternal labor supply (Hallman et al., 2005). With respect to the age of children, we consider three groups: 0–4 years, 5–12 years, and 13-17 (Campaña et al., 2017).

Non-labour income (family) may also affect the time working mothers devote to different activities, and Kalenkoski et al. (2005) show that when household income increases, mothers reduce their time devoted to active child care.[24] With respect to wages, we include the predicted (log) hourly wage rate to control for income and substitution effects, and we also include the squared term to allow for non-linear effects.[25] Given that we are using generated regressors in our models (i.e., predicted wages), we follow Pagan (1984), Murphy and Topel (1985), Gimenez Nadal and Molina (2013, 2015) and Campaña et al. (2017), and bootstrap the standard errors of such regressions. In doing so, we carry out 1,000 replications, where in each replication a random sample with replacement is drawn from the total number of observations.

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[24] We obtain the non-labour income of the family for Mexico, Ecuador, and Colombia through the survey questions related to income earned from subsidies provided by government, rent of properties, financial investments, foreign remittances, and so forth. In the cases of Peru, we cannot consider the non-labour income of the family because those time-use surveys do not provide that information.

[25] To calculate the hourly predicted wages, we use the Heckman technique (1979) and we include all women who have answered all the sections of the Time Use survey in Mexico, Peru, Ecuador, and Colombia and are of legal working-age. Furthermore, we add '1' to the predicted value in order to have values for all the women. This procedure is also performed by Gimenez-Nadal and Molina (2013) in their study for Spain and the UK, and Campaña et al. (2017) in their study for Mexico, Peru, Colombia, and Ecuador. Results of estimated regressions are shown in Table II.B2. of Appendix II.B.

Racial origin, living in a rural or urban area, and region of residence may also influence the time devoted to different activities. To measure racial differences, we consider whether the working mother is indigenous, or not.[26] Regarding geographical differences, living in a rural area involves limited access to education, and other services, such as healthcare (Canelas and Salazar, 2014), which could influence the time devoted to child care activities.[27] For the region of residence of women, in Mexico we consider four regions (Centre, West-Centre, North, and South-South-East); in Peru, four regions (Rest of the Coast, Sierra, Selva, and Lima); in Ecuador, three regions (Sierra, Costa, and Amazon), and in Colombia, six regions (Atlantic, Central, Eastern, Pacific, Bogota, and San Andres). The reference category for Mexico is the Centre region, for Peru, the Selva region, for Panama, the rest of the country, for Ecuador, the Amazon region, and for Colombia, the Bogota region.

As argued by Mondragon-Velez and Peña (2010), it is necessary to consider sectoral composition because the self-employed and the employed are concentrated in different sectors. Following Kenessey (1987), we consider four major sectors covering the following activities. Primary Sector (agriculture, forestry and fishing, mining), Secondary sector (construction, manufacturing), Tertiary sector (transportation, electric, gas and sanitary services; wholesale trade; retail trade) and Quaternary sector (finance, insurance, and real estate; services and public administration). Information on sectoral composition is available for Peru, Ecuador, and Colombia, but the surveys of Mexico do not provide this information.

Table II.B1 (Appendix II.B) shows the variables included in our regressions. Self-employed mothers, on average, in the four countries are 1.77 years older, compared to employed mothers. The prevailing education level for the self-employed mothers is primary education, with 75%, 59%, 73% and 51% for Mexico, Peru, Ecuador, and

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[26] For Mexico and Peru, the time-use surveys provide information on whether the respondent speaks an indigenous language. We assign value '0' to the indigenous variable if the working mother does not speak an indigenous language, and value '1' otherwise. In the case of Ecuador and Colombia, respondents are asked to identify themselves according to their indigenous origin, so that we assign '0' to the indigenous variable if the working mother does not identify herself as indigenous, and value '1' if she is identified as such.

[27] It is important to note that for Mexico, Peru, and Ecuador, time-use surveys were conducted in both urban and rural areas. For Colombia, the time use survey asks respondents if they live in a municipality or not, so the rural variable in Colombia refers to not living in a municipality.

Colombia, respectively, while for employed mothers, primary studies predominate for Mexico (57%), Peru (42%) and Ecuador (44%) and university studies for Colombia (46%). Concerning non-labor income (in Mexico, Ecuador, and Colombia) self-employed mothers obtain higher incomes, compared to employed mothers. Predicted wages (in all four countries) are higher for employed mothers compared to the self-employed mothers. The number of household members in the four countries for self-employed and employed mothers is around four, one of which would be a child between 5 and 12 years old, and around 73% of working mothers are married/cohabiting. Regarding the sectoral composition (Peru, Ecuador, and Colombia) self-employed mothers are concentrated in the tertiary sector, in Peru and Ecuador (50% and 38% respectively), and in the quaternary sector in Colombia (44%). Employed mothers are concentrated in the quaternary sector in Peru, Ecuador, and Colombia (53%, 53% and 59% respectively).

II.5. Results

Table II.3 shows the results of estimating the SUR model for Equations (1), (2), and (3) for Mexico, Peru, Ecuador, and Colombia, respectively. For the time devoted to paid work in the four countries (Column 1, Table II.3), we observe that $\beta_1 < 0$ and is statistically significant, indicating that self-employed mothers devote less time to paid work compared with employed mothers, with these differences being 6.90, 8.63 and 4.86 hours per week in Mexico, Peru, and Ecuador, respectively, and 1.29 hours per day in Colombia.

For the time devoted to unpaid work (Column 2, Table II.3), we find the opposite effect with respect to paid work, and $\beta_1 > 0$ and is statistically significant; that is, self-employed mothers devote more time to unpaid work relative to employed mothers, with these differences being 6.34, 7.11 and 7.00 hours per week in Mexico, Peru, and Ecuador, respectively, and 1.00 hour per day in Colombia. Regarding child care (Column 3, Table 3), self-employed mothers devote more time to child care compared with employed mothers, $\beta_1 > 0$, with these differences being 1.16, 1.06 and 1.33 hours per week in Mexico, Peru, and Ecuador, respectively, and 0.21 hours per week in Colombia.[28]

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[28] Complete results of the SUR estimates for each country are in Tables II.C1 to II.C4 in the Appendix II.C

Table II.3. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, and child care

	(1)	(2)	(3)
	Paid work	Unpaid work	Child care
Panel A: Mexico (hours per week)			
Self – employed	-6.896***	6.336***	1.160***
(N=3,063)	(0.770)	(0.716)	(0.264)
Panel B: Peru (hours per week)			
Self – employed	-8.631***	7.110***	1.060***
(N=1,035)	(1.213)	(0.894)	(0.398)
Panel C: Ecuador (hours per week)			
Self – employed	-4.857***	6.997***	1.325***
(N=3,065)	(0.609)	(0.712)	(0.298)
Panel D: Colombia (hours per day)			
Self – employed	-1.290***	1.001***	0.212***
(N=8,273)	(0.0880)	(0.0602)	(0.0244)

Note: Bootstrapped standard errors in parentheses. Data sources are time use surveys from Mexico (2009), Peru (2010), Ecuador (2012) and Colombia (2012). The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. See Appendix C for a description of all the activities included in paid work, unpaid and child care. Time devoted to the activities is measured in hours per week (Mexico, Peru, and Ecuador) and hours per day (Colombia). We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Regarding the other variables included in the SUR estimates for the four countries (see Tables II.C1 to II.C4 in Appendix II.C), we find that age has a positive relationship with the time devoted to paid work in Peru, Ecuador, and Colombia, while it has a negative relationship with the time devoted to child care in Mexico, Ecuador, and Colombia. Education has a positive relationship with the time devoted by mothers to child care in Mexico and Peru. Regarding the marital status of working mothers, we find that being married/cohabiting has a negative relationship with the time devoted to paid work, and a positive relationship with the time devoted to unpaid work in Mexico and Colombia, whereas in Ecuador being married /cohabiting has a positive relationship with the time devoted to unpaid work. Regarding wages, higher wages are related to more time devoted to paid work in Mexico and Ecuador, and with more time in child care in Mexico and Colombia.

A greater number of household members is negatively related to the time devoted to unpaid work in Mexico, Ecuador, and Colombia. Apart from having a positive relationship with the time devoted to child care in the four countries, having more children is related to more time devoted by mothers to unpaid work and less time devoted by mothers to paid work in the four countries. Finally, regarding the sectoral composition, working in the third sector (transportation, electric, gas and sanitary services, wholesale trade, retail trade) is positively related to the time devoted to paid work in Peru, Ecuador, and Colombia, and negatively related to the time devoted to unpaid work in Peru and Ecuador, in comparison to working in the primary sector (agriculture, forestry and fishing, mining).

Based on the importance of the age of children in the time allocation decisions of their mothers, Table II.4 shows the results of estimating the SUR model for Equations (1), (2), and (3) for Mexico, Peru, Ecuador, and Colombia, respectively considering the children's age range (the three ranges analyzed are 0-4, 5-12, and 13-17 years). We observe that self-employed mothers of the three groups analyzed from the four countries devote less time to paid work and more time to unpaid work and child care. These differences are statistically significant at standard levels, except for the case of Peru in the time dedicated to child care in the age range 13-17. In general, the differences between self-employed and employed mothers in the time devoted to the three activities decreases as children grow older.[29]

In summary, we find that self-employed mothers devote more time to child care compared to employed mothers. Thus, we next classify child care into two categories, educational and non-educational child care. Our main interest is motivated by prior research showing that the time devoted by parents (mainly mothers) to educational child care contributes to the formation of the human capital of the children (Blau and Grossberg, 1990; Brooks-Gunn et al., 2002; Cooksey and Fondell, 1996; Datcher-Loury, 1988; Han et al., 2001; Hsin and Felfe, 2014; Kalenkoski and Foster, 2008; Leibowitz, 1972, 1974, 1977; Marsiglio, 1991; Sayer et al., 2004).

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[29] Complete results of the SUR estimates for each country are in Tables II.C5 to II.C8 in the Appendix II.C

Table II.4. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, and child care considering children age range

	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
	Paid work	Unpaid work	Child care	Paid work	Unpaid work	Child care	Paid work	Unpaid work	Child care
	Age range 0-4			Age range 5-12			Age range 13-17		
Panel A: Mexico (hours per week)									
Self – employed	-10.12***	7.910***	2.769***	-7.466***	6.568***	2.066***	-6.031***	6.633***	0.783**
(N=3,063)	(1.407)	(1.394)	(0.754)	(0.969)	(0.871)	(0.399)	(1.063)	(0.947)	(0.306)
Panel B: Peru (hours per week)									
Self – employed	-9.191***	7.784***	2.430**	-9.572***	7.579***	1.686***	-7.439***	6.809***	0.632
(N=1,035)	(2.319)	(1.672)	(1.017)	(1.518)	(1.155)	(0.583)	(1.583)	(1.207)	(0.462)
Panel C: Ecuador (hours per week)									
Self – employed	-7.268***	8.211***	1.822***	-4.881***	7.372***	2.226***	-5.672***	7.379***	1.689***
(N=3,065)	(1.093)	(1.180)	(0.639)	(0.750)	(0.825)	(0.409)	(0.875)	(1.033)	(0.410)
Panel D: Colombia (hours per day)									
Self – employed	-1.481***	1.084***	0.527***	-1.239***	0.989***	0.245***	-1.284***	0.980***	0.127***
(N=8,273)	(0.164)	(0.118)	(0.0666)	(0.118)	(0.0808)	(0.0345)	(0.131)	(0.0876)	(0.0289)

Note: Bootstrapped standard errors in parentheses. Data sources are time use surveys from Mexico (2009), Peru (2010), Panama (2011), Ecuador (2012) and Colombia (2012). The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. See Appendix II.A for a description of all the activities included in paid work, unpaid work and child care. Time devoted to the activities is measured in hours per week (Mexico, Peru, and Ecuador) and hours per day (Colombia). We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively

Educational child care includes activities such as playing with children, reading stories, taking them to the park, attending meetings and events at the school, helping with homework, and bringing to and picking up children from school. Non-educational child care is related to the basic functioning of children, such as feeding, bathing, and providing medical care.

Table II.5 shows the results of the estimation of the SUR model, now considering the two types of child care (educational and non-educational). For non-educational child care (Column 3, Table 5), self-employed mothers devote more time to non-educational child care compared with their employed counterparts in Mexico, Peru, and Colombia, with these differences being 0.36 and 0.80 hours per week in Mexico and Peru and 0.11 hours per day in Colombia.   With respect to educational child care (Column 4, Table 5), self-employed mothers devote more time to educational child care compared with their employed counterparts in Mexico, Ecuador, and Colombia, with these differences being 0.80 and 1.07 hours per week in Mexico and Ecuador, respectively, and 0.10 hours per day in Colombia.[30]Thus, in three of the four countries, self-employed mothers devote comparatively more time to educational child care activities than do employed mothers. From these results, we can highlight that, in the case of Mexico and Colombia, self-employed mothers devote more time to the two activities of child care. In Peru, self-employed mothers devote more time to non-educational child care. And, finally, in Ecuador, self-employed mothers devote more time to educational child care.

Research has shown the importance of the level of education in determining the time devoted to child care (Guryan et al., 2008; Gimenez-Nadal and Molina, 2013; Campaña, et al., 2017). Thus, we estimate the SUR model for Equations (1), (2), and (3), with education interactions, for Mexico, Peru, Ecuador, and Colombia, respectively, as follows: Secondary education*self-employed and University education*self-employed (reference category: Primary education). The reason we consider the educational dimension is that education may change the opportunity costs of working, the preferences for child care time, and the productivity of child care activities, among other factors, and

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[30] Complete results of the SUR estimates for each country are in Tables II.C9 to II.C12 in the Appendix II.C

we explore whether any differential effects exist according to the level of education of the mother.

Table II.5. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, non-educational child care and educational child care

	(1)	(2)	(3)	(4)
	Paid work	Unpaid work	Non-educational Child care	Educational Child care
Panel A: Mexico (hours per week)				
Self – employed	-6.896***	6.336***	0.360*	0.800***
(N=3,063)	(0.770)	(0.716)	(0.215)	(0.148)
Panel B: Peru (hours per week)				
Self – employed	-8.631***	7.110***	0.798***	0.262
(N=1,035)	(1.203)	(0.881)	(0.271)	(0.264)
Panel C: Ecuador (hours per week)				
Self – employed	-4.857***	6.997***	0.252	1.072***
(N=3,065)	(0.609)	(0.712)	(0.161)	(0.213)
Panel D: Colombia (hours per day)				
Self – employed	-1.290***	1.001***	0.109***	0.103***
(N=8,273)	(0.0895)	(0.0590)	(0.0123)	(0.0180)

Note: Bootstrapped standard errors in parentheses. Data sources are time use surveys from Mexico (2009), Peru (2010), Ecuador (2012) and Colombia (2012). The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. See Appendix C for a description of all the activities included in paid work, unpaid non-educational child care and educational child care. Time devoted to the activities is measured in hours per week (Mexico, Peru, and Ecuador) and hours per day (Colombia). We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). *p = 0.90; **p = 0.95; ***p=0.99

Table II.6 show the results of estimating these models. For the time devoted to educational child care (Column 4, Table II.6), we observe that self-employed mothers devote more time to educational child care, compared with employed mothers, in Mexico, Ecuador, and

Colombia, and educational differences emerge in these three countries.[31] In Mexico, self-employed mothers with secondary education are those mothers who devote the most time to educational child care (1.95 more hours per week), in comparison to employed mothers, while self-employed mothers with primary and university education devote 0.51 more hours per week to educational child care, in comparison to employed mothers. In the cases of Ecuador and Colombia, self-employed mothers with university education are those who devote the most time to educational child care (1.93 more hours per week and 0.18 more hours per day, respectively), in comparison to employed mothers, while self-employed mothers with primary and secondary education in Ecuador and Colombia devote 0.708 more hours per week and 0.07 more hours per day, respectively to educational child care, in comparison to employed mothers.[32] These results show that, in Mexico (secondary education), Ecuador (university education) and Colombia (university education), the differences between self-employed mothers and employed mothers in the time devoted to educational child care increase with the level of education.

For the time devoted to non-educational child care (Column 3, Table II.6), we observe that in Peru and Colombia self-employed mothers devote more time to non-educational child care, compared with employed mothers, with no differences according to the educational level of the mother. We find no statistically-significant difference for Mexico, in contrast to previous results, when we exclude educational interactions, because of its low statistical significance in Table II.5, where the coefficient is statistically-significant at the 90% level, but which disappears when we estimate an augmented model.[33]

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[31]For the case of Peru, employed mothers with university studies relative to employed mothers with primary education, devote 1.90 more hours per week, respectively, to educational child care, and this is statistically significant.

[32]. Complete results of the SUR estimates for each country considering education level are are in Tables II.C13 to II.C16 in the Appendix II.C.

[33] Considering the importance of the levels of education in the time dedicated to the educational care of children, Table II.C17 of Appendix C shows a broader classification in terms of educational levels, following Guryan et al., (2008), who consider five levels of education: level of education 1 (less than 12 years of education or less than a high school degree), level of education 2 (12 years of education or a high school degree), level of education 3 (between 13 and 16 years of education or more of high school degree but less of university degree), level of education 4 (16 years of education or university degree) and level of education 5 (more than 16 years of education or more of university degree). The results obtained are consistent, both in a general way, and considering the education levels of the mothers.

Table II.6. Difference between self-employed and employed mothers in the time devoted to paid work, unpaid work, non-educational child care and educational child care (education level)

	(1)	(2)	(3)	(4)
	Paid work	Unpaid work	Non-educational child care	Educational child care
Panel A: Mexico (N=3,063) (hours per week)				
Self-employed	-6.872***	7.040***	0.265	0.508***
	(0.934)	(0.860)	(0.242)	(0.164)
Secondary education	-2.586**	-1.345	-0.249	0.279
	(1.115)	(1.187)	(0.334)	(0.268)
University education	-6.984***	-2.612	0.597	0.221
	(1.520)	(1.576)	(0.461)	(0.314)
Secondary education*self-employed	0.281	-1.182	0.814	1.440***
	(2.120)	(1.717)	(0.579)	(0.462)
University education*self-employed	-0.489	-3.706*	-0.238	0.472
	(2.062)	(2.096)	(0.699)	(0.509)
Panel B: Peru (N=1,035) (hours per week)				
Self-employed	-8.839***	6.896***	0.942***	0.509
	(1.554)	(1.200)	(0.364)	(0.341)
Secondary education	3.089	-0.470	0.470	1.063*
	(2.631)	(1.855)	(0.578)	(0.570)
University education	-1.356	-0.799	0.798	1.897***
	(3.394)	(2.272)	(0.792)	(0.687)
Secondary education*self-employed	0.119	-0.434	-0.419	-0.714
	(2.701)	(1.968)	(0.575)	(0.593)
University education*self-employed	0.805	1.496	-0.154	-0.269
	(3.036)	(2.003)	(0.644)	(0.644)
Panel C: Ecuador (N=3,065) (hours per week)				
Self-employed	-5.931***	7.217***	0.148	0.708***
	(0.782)	(0.928)	(0.205)	(0.243)
Secondary education	-0.357	-0.791	-0.349	0.00966
	(1.254)	(1.412)	(0.330)	(0.42)
University education	-0.665	-2.159	-0.179	0.587
	(1.741)	(1.931)	(0.425)	(0.571)
Secondary education*self-employed	1.477	0.152	0.171	0.768
	(1.511)	(1.640)	(0.352)	(0.514)
University education*self-employed	4.771***	-1.654	0.425	1.225*
	(1.688)	(1.763)	(0.433)	(0.633)
Panel D: Colombia (N=8,273) (hours per day)				
Self-employed	-1.312***	0.933***	0.106***	0.0669***
	(0.153)	(0.0950)	(0.0170)	(0.0247)
Secondary education	-0.000593	0.0497	0.00905	-0.0190
	(0.182)	(0.116)	(0.0241)	(0.0331)
University education	-0.672***	0.0348	0.0244	0.00181
	(0.209)	(0.141)	(0.0292)	(0.0397)
Secondary education*self-employed	-0.132	0.284**	-0.0290	0.0101
	(0.213)	(0.133)	(0.0255)	(0.0378)
University education*self-employed	0.231	-0.0898	0.0430	0.113**
	(0.220)	(0.143)	(0.0325)	(0.0448)

Note: Bootstrapped standard errors in parentheses. Data sources are time use surveys from Mexico (2009), Peru (2010), Ecuador (2012) and Colombia (2012). The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Primary education (reference category) is equivalent to less than high school degree, secondary education is equivalent to high school degree, and university education is equivalent to more than a high school degree. See Appendix C for a description of all the activities included in paid work, non-market work, and non-educational and educational child care. Time devoted to the activities is measured in hours per week (Mexico, Peru, and Ecuador) and hours per day (Colombia). We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). *p = 0.90; **p = 0.95; ***p=0.99.

II.6 Conclusions

We analyze the time employed and self-employed mothers in four Latin American countries devote to paid work, unpaid work, and child care. The results indicate that self-employed mothers devote less time to paid work and more time to unpaid work and child care, compared to employed mothers, in the four countries. Furthermore, we separately analyze the time devoted to educational and non-educational child care, finding that self-employed mothers in Mexico, Ecuador, and Colombia devote more time to this activity compared to employed mothers, and that factors such as education influence behavior patterns among both self-employed and employed mothers. The differences between self-employed and employed mothers in the time devoted to educational child care increase with the level of education in Mexico, Ecuador, and Colombia. These results serve to support the hypothesis that self-employment is an option for mothers to gain greater control over their allocation of time, primarily child care.

The fact that many self-employed mothers devote comparatively more time to the educational care of their children, compared to employed mothers, has important implications, since the human capital of children is a fundamental factor for their present and future results. The fact that self-employed mothers devote comparatively more time to this type of care raises the question of whether their children will actually accumulate more human capital, which would be reflected in better results at school and/or in the labor market, compared to children of employed mothers. Any differences found would indicate that access to formal child care services is equally distributed among mothers, and self-employment would encourage differences between children. No differences found would indicate that access to formal child care services is not distributed equally among mothers, and would favor employed mothers, so that self-employment would be a tool to fill this gap. Our data does not allow us to answer these questions, leaving this line open for future research.

In the context of public policy recommendations, it is important to note that, despite considerable increases in the participation of Latin American women in the labor market, this participation is still low compared to developed countries, since almost half of the women in Latin America and the Caribbean countries in the 15-64 age range remain outside the labor market (Mateo-Díaz and Rodríguez-Chamussy 2016). Hence, governments must make the necessary efforts to ensure that more women join the labor market as employed or self-employed. The low participation rate of women in the labor market implies a higher

probability of intergenerational transmission of poverty and inequality (Mateo-Díaz and Rodríguez Chamussy 2016). Thus, the characteristics of certain women, such as older women, and women with lower levels of education, or greater domestic responsibilities (Heller 2010, Mondragón-Vélez and Peña 2010), make it difficult for them to enter the salaried sector, with some women entering the labor market as self-employed.

In order to promote self-employment among women who cannot access the salaried sector, public policy-makers need to encourage entrepreneurship. As Baumol (2008) points out, for any economy to prosper in the future, the entrepreneurial spirit must be promoted, especially via public policies that promote small- business activities. The correct policies would help the self-employed, not only to create their own jobs, but also to create new jobs, contributing in this way to reducing unemployment (Congregado et al., 2010). To that end, it is necessary for women to have access to credit for their businesses. However, in Latin American countries, most small and medium enterprises face serious problems in accessing credit, and these problems are greater when women apply for these credits (Heller 2010). As argued by Cheston and Kuhn (2002), it is important that governments support microcredit and microfinance operations, along with training for commercial activities, given that these strategies are key to fighting poverty.

Another limitation to the access of women to the labor market is the presence of children at home. Formal child care services are limited in these countries, especially for younger children between 0-3 years old (Mateo Díaz and Rodriguez-Chamussy 2016). In addition, as indicated by Araujo et al., (2013), there are problems in access to formal child-care services, primarily in rural areas. Governments must do everything possible so that more households with young children can have access to such services. Authors such as Hallman et al. (2005) for Guatemala, Mateo Díaz and Rodriguez-Chamussy (2016) for Mexico, and Contreras et al. (2012) for Chile, show the benefits of formal child care services and their positive effect on mothers' working hours.

One limitation of our analysis is that the data used are cross-sectional, since there are no panel data in time use surveys. Thus, we cannot identify differences in the time dedicated to paid work, unpaid work, and child care considering the individual or permanent heterogeneity in preferences, and individual characteristics. This aspect is fundamental to our case, given that prior empirical evidence has shown that the personal reasons leading to choosing self-employment are related to the presence of conflict between work and family responsibilities

(Johansson and Öun, 2015). Investigations that analyze the specific reasons why self-employed women choose this option, where a better balance between personal and family life is a possible response, are necessary if we want to complement and consolidate the evidence presented in this work.

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Appendix II.A: Classification of activities

Table II.A1. Mexico

Paid work	Regular work in all paid jobs
Unpaid work	Care for or raise farm animals, caring and sow the orchard, collect/ carry/store firewood, collecting fruits/mushrooms/flowers, hunting and fishing for consumption, carry or store water, elaborate or knitting clothes/tablecloth/curtains/other, threshing corn or prepare tortillas, turn the stove or oven, cooking or preparing food or drinks, heating food or drinks, serve food, washing/drying/accommodate dishes, bringing food to a household member to work or an educative center, cleaning or tidying the house, cleaning the exterior of the house, separate/remove/burn trash, wash/tender/drying clothes, separate or fold the clothes, ironing clothes, mend clothes/tablecloth/curtains, collect or bring clothes and shoes, clean shoes, construction or extension of the home, home repair, appliance repair, carry or supervise appliance repair, wash or clean the vehicle, repair or maintain the vehicle, carry or repair the vehicle, home shopping, purchase construction materials, several purchases as: dishes/tablecloths/ furniture/toys/clothing/footwear, carry or bring to an older person's home for medical care, supervise the construction or repair of the house, buy car/house/apartment, make payments/formalities from home, responsible for accounts/household expenses, protection measures for home, waiting home services like gas; The following aid for household members who are dependent: feeding, bathing or cleaning, administer medications, take them to receive medical attention, give special therapy or exercises; The following to help to other households: help with unpaid work, caring for people.

Child care

Non-educational child care	Feeding a minor under 6 years, bathing/grooming/dressing a minor under 6 years, bed a minor under 6 years, carrying/ bringing /accompany a minor under 15 to receive medical attention.
Educational child care	Picking up or dropping of an educative center a minor under 15 years, help with homework a minor under 15 years, attend activities/ meetings/festivals in school from a member of household under 15 years.

Source: Time Use Survey of Mexico 2009

Table II.A2. Peru

Paid work	Regular work in all jobs.
Unpaid work	Cooking or preparing food, heating food, prepare food in advance, wash dishes and clean the kitchen, take food to household members to work or study centre, collect firewood for cooking, lighting firewood for cooking, prepare pastries for home, making beds and ordering room, clean the bathroom, general cleanliness of housing, accommodate and fix housing, tasks related to the trash, carry water for household consumption, clean or wash vehicles home, laundry, ironing clothes, accommodate clothing, take clothes to the laundry, shoe care, mending clothing, home repairs, making housing constructions, appliance repairs, carry appliances repair, care for household members who are sick, bring the hospital household members who are sick, bring to receive therapy household members who are sick, prepare home remedies, buy household items, small household purchases, buying medicine for home, buy school supplies, buy clothes, buy furniture, buy spare parts for appliances, buy cars, buy spare parts for cars, farm animal breeding, plant/ watering/fertilize the orchard, pick fruit or herbs in the orchard, carrying water for the orchard or animals, supervise home repairs, supervising chores, responsibility for household accounts, several payments, several formalities, charge government subsidies, responsible for the safety of home, watch for the delivery of a service in the home such as gas, paperwork to rent or buy a house; The following aid for household members who are dependent: cook, clean room, washing/ironing clothes, feed them, bathing, care during the hours of the night, picking up or dropping care center/study center, carry health center, practice therapy; The following to help to other households: cooking, general cleaning, fetching water, washing and ironing clothes, home repairs, care of children, health care, carry to medical center, help with shopping, perform formalities, take to work/educational centre.

Child care

Non-educational child care	Breastfeed newborn, feeding a baby or child, bathing/dressing/ changing diaper a baby or child, therapy practice for a baby/child /adolescent.
Educational child care	Play/read stories to a baby or child, help with homework for a child or teenager, attend activities at an educational center that assists a child or adolescent who is a member of the household, carry household members to educational centre, pick up household members at educational centre.

Source: Time Use Survey of Peru 2010

Table II.A3. Ecuador

Paid work	Regular work in all paid jobs.
Unpaid work	Preparing food, serving food, washing dishes, cleaning the place where food is prepared, thresh and grinding grain, beverage preparation, slaughtering of animals for consumption, bringing food to a household member, turn the wood/coal stove, making preserves, make bread, preparing other food products, prepare milk, dried beans, dried meat, dried fish products, making beds, cleaning bathrooms, cleaning house, fetch water for household consumption, wash a vehicle, littering, shoe cleaning, laundry, ironing clothes, take clothes to the cleaners, fold clothes, draw up or mend clothes, buy meats/vegetables/fruits, daily shopping, buy medicine, buy school supplies/clothes/shoes, buy goods/ appliances, buy orthopedic appliances, moving home, accommodating house (terrace, closet), , accompany household member to receive medical attention, carry or pick up a household member to work, accompany a household member to a special class or training, caring for sick household member by day or night, carry a household member to a health center, carry a household member to a therapist, prepare home remedies for any household member, general home repair, repairs means of transportation, appliance repair, care for farm animals, milking/shearing/collect eggs, collecting water for the terrain, collecting firewood/mushrooms/herbs, collect flowers and fruits, hunting and fishing for consumption by household members, most orchard activities (sowing, harvesting), charge government subsidies, rental housing formalities, payment basic services, payment formalities, order documents, supervising chores, do household accounts, home security monitoring; supervising home repairs; The following aid for household members who are disabled; care, feeding, grooming, therapies, care at night, giving special meal, take/ accompany therapies or medical services, perform formalities, room cleaning, washing and ironing clothes separately; The following to help to other households: help with unpaid work, caring people.

Child care	
Non-educational child care	Child feeding, bathing children, practices special exercise or therapy for children.
Educational child care	Play/talk/read stories to children, attending meetings/ festivals/other activities in school, help with homework, carry or pick up a household member to an educational center.

Source: Time Use Survey of Ecuador 2012

Table II.A4. Colombia

Paid work	Regular work in all paid jobs.
Unpaid work	Prepare and serve food, clear the dishes/washing dishes, bring the food to household members to their work/study center, washing/ironing/ store clothes, repairing clothes/tablecloths/blankets/shoes/etc, produce clothes for persons in this household, picking up or dropping off clothing/shoes, clean housing, pet care/care garden/clean any household vehicle, bring water for household use, bring fuel (coal, gas, oil) for cooking, build/expand housing, repair/make housing installations, repair appliances/furniture/household vehicles, carry repair appliances/furniture/household vehicles, buy household items, buy or pick up medicines, supervise or direct household activities, pay bills/doing formalities, find housing for rent or purchase, charge government subsidies, displacements to make purchases or formalities, carry or bring any member of this household to social/cultural/recreational events, help without pay at a job or business of any member of the household, activities like planting/watering/ fertilize/weeding the orchard, raise animals for consumption of the household, planting/watering/ weeding crops for sale without being paid, raising/hunting/ fishing animals for sale without being paid, mineral extraction without being paid, collect firewood for home, other orchard activities, be aware of household members, feed or assist in feeding to household members from 18 years of age who need help, bathing/dressing to household members from 18 years of age who need help, give medicines/therapies provide/treatment of diseases to household members from 18 years of age who need help, accompany to medical appointments or other health care to household members from 18 years of age who need help, carry or bring to medical appointments or other health care to household members from 18 years of age who need help, other activities related to unpaid work; The following to help in other households: help without pay at a job or business, help with household chores, minor home repairs or yard work, build or make any extension of the house, care for children under 12 years who are not ill or are disabled, care for over 60 who are not ill or are disabled, care for sick people, care for the disabled, travel for aid to other households, help with activities like planting/watering/fertilize/ weeding the orchard, raise animals for that household consumption, plant/watering/weeding crops for sale without being paid, raising/ hunting/fishing animals for sale without being paid, extraction of minerals without being paid, gather wood for the household, other activities that orchard.
Child care*	
Non-educational child care	Feed or assist in feeding for minor household members, bathing/dressing minor household members, give medicines/therapies or provide/ treatment for diseases to minor household members.
Educational child care	Play/read stories/carry to the park for household members under five years of age, carry or bring to an educative center a household member, help with homework to minor household members.

Source: Time Use Survey of Colombia 2012

Note: *The variables considered for child care come from two types of questions, direct and indirect. Indirect questions ask for the time spent by respondents in helping other household members. These questions give the option of indicating to whom this aid is provided, so that aid to household members under 18 years is considered in the category of child care, and aid to household members who are 18 years of age or older is considered in the category of unpaid work. Direct questions are: Play/read stories/take to the park household members under five years of age, take or bring to an education center a household member. Indirect questions are: feed or assist in feeding household members, bathing/dressing household members, give medicines/therapies provide treatment for diseases to household members, help with homework for household members.

APPENDIX II.B

Table II.B1. Demographic characteristics of the samples

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	Mexico				Peru				Ecuador				Colombia			
Variables	Self-employed		Employed		Self-employed		Employed		Self-employed		Employed		Self-employed		Employed	
Age	38.82	(8.29)	37.30	(8.09)	39.20	(8.28)	38.68	(8.26)	39.78	(9.26)	36.44	(8.58)	38.46	(8.69)	36.76	(8.29)
Primary education	0.75	(0.43)	0.57	(0.49)	0.59	(0.49)	0.42	(0.49)	0.73	(0.44)	0.44	(0.50)	0.51	(0.50)	0.25	(0.43)
Secondary education	0.14	(0.35)	0.16	(0.37)	0.28	(0.45)	0.21	(0.41)	0.18	(0.38)	0.23	(0.42)	0.30	(0.46)	0.29	(0.45)
University education	0.10	(0.31)	0.26	(0.44)	0.13	(0.33)	0.36	(0.48)	0.09	(0.28)	0.33	(0.47)	0.19	(0.39)	0.46	(0.50)
Married/Cohabiting	0.82	(0.38)	0.76	(0.42)	0.78	(0.41)	0.76	(0.43)	0.65	(0.48)	0.63	(0.48)	0.69	(0.46)	0.71	(0.46)
Non labour income family	27.00	(129.4)	23.87	(90.8)	-	-	-	-	51.54	(142.5)	40.90	(117.7)	67.87	(224.3)	66.55	(214.0)
Log hourly predicted wage	0.70	(0.49)	0.86	(0.46)	0.78	(0.22)	0.87	(0.24)	0.78	(0.37)	0.97	(0.39)	0.71	(0.71)	1.04	(0.58)
N. household members	4.52	(1.50)	4.24	(1.40)	4.54	(1.66)	4.44	(1.45)	4.66	(1.85)	4.26	(1.65)	4.10	(1.42)	3.81	(1.29)
N. younger child 0- 4	0.32	(0.60)	0.36	(0.59)	0.37	(0.57)	0.34	(0.55)	0.36	(0.61)	0.39	(0.60)	0.30	(0.53)	0.32	(0.52)
N. younger child 5- 12	0.97	(0.89)	0.88	(0.85)	0.94	(0.88)	0.93	(0.85)	1.06	(0.99)	1.00	(0.90)	0.81	(0.82)	0.75	(0.74)
N. younger child 13- 17	0.74	(0.76)	0.66	(0.75)	0.74	(0.71)	0.70	(0.75)	0.76	(0.78)	0.61	(0.76)	0.65	(0.71)	0.52	(0.66)
Indigenous	0.10	(0.31)	0.04	(0.20)	0.21	(0.41)	0.19	(0.39)	0.16	(0.37)	0.07	(0.25)	0.05	(0.22)	0.03	(0.16)
Rural Area	0.23	(0.42)	0.15	(0.36)	0.29	(0.45)	0.22	(0.41)	0.51	(0.50)	0.38	(0.48)	0.15	(0.36)	0.07	(0.26)
Sector 1	-	-	-	-	0.15	(0.35)	0.23	(0.42)	0.30	(0.46)	0.22	(0.41)	0.04	(0.20)	0.05	(0.21)
Sector 2	-	-	-	-	0.10	(0.30)	0.11	(0.31)	0.09	(0.29)	0.11	(0.32)	0.14	(0.35)	0.13	(0.34)
Sector 3	-	-	-	-	0.50	(0.50)	0.12	(0.33)	0.38	(0.49)	0.14	(0.35)	0.38	(0.48)	0.23	(0.42)
Sector 4	-	-	-	-	0.25	(0.43)	0.53	(0.50)	0.23	(0.42)	0.53	(0.50)	0.44	(0.50)	0.59	(0.49)
Region 1	0.26	(0.44)	0.28	(0.45)	0.27	(0.45)	0.36	(0.48)	0.56	(0.50)	0.53	(0.50)	0.23	(0.42)	0.15	(0.36)
Region 2	0.29	(0.45)	0.29	(0.45)	0.33	(0.47)	0.21	(0.41)	0.25	(0.44)	0.29	(0.45)	0.19	(0.39)	0.20	(0.40)
Region 3	0.17	(0.38)	0.25	(0.44)	0.24	(0.43)	0.20	(0.40)	0.19	(0.39)	0.18	(0.38)	0.18	(0.38)	0.18	(0.38)
Region 4	0.28	(0.45)	0.18	(0.38)	0.16	(0.37)	0.22	(0.42)	-	-	-	-	0.19	(0.39)	0.14	(0.34)
Region 5	-	-	-	-	-	-	-	-	-	-	-	-	0.20	(0.40)	0.29	(0.46)
Region 6	-	-	-	-	-	-	-	-	-	-	-	-	0.01	(0.12)	0.04	(0.19)
Observations	986		2077		621		414		1596		1469		3496		4777	
% of observations	0.32		0.68		0.60		0.40		0.52		0.48		0.42		0.58	
Total observations	3063				1035				3065				8273			

Note: Data sources are time use surveys from Mexico (2009), Peru (2010), Ecuador (2012) and Colombia (2012). The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Primary education is equivalent to less than high school degree, Secondary education is equivalent to high school degree and university education is equivalent to more than a high school degree. Non-labour incomes are in US dollars for Mexico, Ecuador and Colombia. Rural area is considered in Mexico, Peru, and Ecuador, while Colombia is not considered to be a municipality. Standard deviation in parentheses.

Table II.B2. Heckman´s Model for Predicted Wages in Mexico, Peru, Ecuador, and Colombia

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Mexico		Peru		Ecuador		Colombia	
	Hourly wage	Participation	Hourly wage	Participation	Hourly wage	Participation	Hourly wage	Participation
Years of education	0.225***	0.0626***	0.106***	0.0550***	0.213***	0.0494***	0.350***	0.0916***
	(0.00745)	(0.00297)	(0.00855)	(0.00494)	(0.00861)	(0.00326)	(0.00823)	(0.00210)
Potential experience	0.0527***	0.0733***	0.0604***	0.0786***	0.0455***	0.0628***	0.0622***	0.0911***
	(0.00584)	(0.00253)	(0.00957)	(0.00509)	(0.00605)	(0.00302)	(0.00592)	(0.00178)
Potential experience squared	-0.0521***	-0.135***	-0.0899***	-0.126***	-0.0332***	-0.110***	-0.0323***	-0.172***
	(0.00976)	(0.00480)	(0.0160)	(0.00986)	(0.00865)	(0.00540)	(0.0112)	(0.00407)
Indigenous	0.0699	0.0942**	0.0611	0.163***	0.118*	0.164***	0.323***	0.321***
	(0.0728)	(0.0417)	(0.0705)	(0.0479)	(0.0602)	(0.0322)	(0.0719)	(0.0336)
Rural Area	-0.212***	-0.347***	0.0553	-0.262***	-0.236***	-0.110***	-0.0124	-0.307***
	(0.0418)	(0.0250)	(0.0743)	(0.0589)	(0.0398)	(0.0282)	(0.0370)	(0.0191)
Region 1	0.0489	0.0326	-0.00855	0.218***	-0.0502	0.202***	-0.453***	-0.348***
	(0.0399)	(0.0255)	(0.0665)	(0.0526)	(0.0645)	(0.0383)	(0.0492)	(0.0209)
Region 2	0.120***	-0.0602**	-0.138*	0.170***	-0.275***	-0.150***	-0.333***	-0.411***
	(0.0451)	(0.0267)	(0.0818)	(0.0513)	(0.0680)	(0.0367)	(0.0466)	(0.0234)
Region 3	0.0116	-0.0479*	-0.0258	0.106**	-	-	-0.333***	-0.240***
	(0.0523)	(0.0266)	(0.0993)	(0.0459)	-	-	(0.0478)	(0.0233)
Region 4	-	-	-	-	-	-	-0.409***	-0.190***
	-	-	-	-	-	-	(0.0434)	(0.0238)
Region 5	-	-	-	-	-	-	0.0942	-0.116***
	-	-	-	-	-	-	(0.0791)	(0.0387)
Head of family	-	0.454***	-	0.617***	-	0.746***	-	0.439***
	-	(0.0316)	-	(0.0692)	-	(0.0412)	-	(0.0204)
In partner	-	-0.400***	-	-0.262***	-	-0.297***	-	-0.331***
	-	(0.0248)	-	(0.0533)	-	(0.0331)	-	(0.0171)
Unemployed	-	-7.402***	-	-7.531***	-	-7.287***	-	-8.104***
	-	(0.0809)	-	(0.146)	-	(0.0920)	-	(0.0611)
Children under 18	-	-0.0715***	-	-0.0479***	-	-0.0511***	-	-0.0832***
	-	(0.00976)	-	(0.0158)	-	(0.0106)	-	(0.00573)
N. household members	-	0.0195***	-	-0.00149	-	-0.00629	-	-0.00273
	-	(0.00559)	-	(0.0102)	-	(0.00742)	-	(0.00375)
Constant	-1.599***	-1.248***	-0.366	-1.222***	-1.011***	-1.235***	-2.970***	-1.234***
	(0.169)	(0.0627)	(0.263)	(0.0848)	(0.188)	(0.0752)	(0.181)	(0.0400)
Mills Ratio		0.371***		0.420***		0.170***		0.549***
		(0.0722)		(0.153)		(0.0588)		(0.0882)
Observations	7331	19882	2357	4996	5.608	14.619	21892	46257

Notes: Bootstrapped standard error in parentheses. Data sources are time use surveys from Mexico (2009), Peru (2010), Panama (2011), Ecuador (2012) and Colombia (2012). * Significant at the 90% level ** Significant at the 95% level *** Significant at the 99% level. Sample consists of women aged 14-65 from Time-Use Surveys of México and Peru. In Ecuador, sample consists of women aged 15-65 from Time-Use Surveys of Ecuador, and in Colombia sample consists of women aged 15-55 from Time-Use Survey of Colombia. * Rural area is considered in Mexico, Peru and Ecuador, while Colombia is not considered to be a municipality.Predicted hourly wage are in us dollar in the four countries.

Appendix II.C: Additional results

Table II.C1. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, and child care in Mexico

	(1)	(2)	(3)
	Paid work	Unpaid work	Child care
Self-employed	-6.896***	6.336***	1.160***
	(0.770)	(0.716)	(0.264)
Age	-0.283	0.346	-0.319***
	(0.252)	(0.224)	(0.0803)
Age squared	0.311	-0.261	0.222**
	(0.307)	(0.274)	(0.0884)
Secondary education	-2.507**	-1.746	0.712*
	(1.091)	(1.072)	(0.401)
University education	-7.072***	-3.347**	0.909
	(1.501)	(1.512)	(0.552)
Married/Cohabitting	-4.570***	3.983***	-0.0323
	(0.805)	(0.800)	(0.268)
Non-labour income (family)	-0.00722**	0.000466	-0.000442
	(0.00293)	(0.00405)	(0.000777)
Log hourly predicted wage rate	2.480**	-1.144	1.411***
	(1.047)	(1.101)	(0.362)
Log hourly predicted wage rate sq	2.060*	1.453	0.215
	(1.101)	(1.176)	(0.368)
N. household members	-0.252	-0.744**	-0.00951
	(0.296)	(0.328)	(0.0973)
N. younger child 0-4	-0.797	1.639**	6.681***
	(0.736)	(0.660)	(0.331)
N. younger child 5-12	-1.231***	2.842***	1.875***
	(0.456)	(0.460)	(0.174)
N. younger child 13-17	0.461	1.663***	-0.833***
	(0.560)	(0.595)	(0.189)
Indigenous	-0.407	1.295	0.207
	(1.492)	(1.430)	(0.550)
Rural area	-2.120**	7.181***	-0.221
	(0.933)	(0.870)	(0.321)
Sector 2	-	-	-
	-	-	-
Sector 3	-	-	-
	-	-	-
Sector 4	-	-	-
	-	-	-
Region 1	-1.020	2.510***	-1.242***
	(0.828)	(0.865)	(0.305)
Region 2	-0.275	0.776	-1.106***
	(0.792)	(0.842)	(0.328)
Region 3	0.999	-2.056**	-0.632*
	(0.953)	(0.870)	(0.333)
Constant	50.51***	20.92***	11.25***
	(4.913)	(4.476)	(1.802)
R-squared	0.074	0.105	0.408
Observations	3,063	3,063	3,063

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Non-labour income is in US dollars. *Rural area is considered for Mexico, Peru and Ecuador, while Colombia is not considered to be a municipality. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C2. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, and child care in Peru

	(1)	(2)	(3)
	Paid work	Unpaid work	Child care
Self-employed	-8.631***	7.110***	1.060***
	(1.213)	(0.894)	(0.398)
Age	0.945*	-0.0583	0.0933
	(0.568)	(0.398)	(0.185)
Age squared	-0.947	0.139	-0.274
	(0.716)	(0.490)	(0.218)
Secondary education	3.185	-0.718	0.788
	(2.082)	(1.374)	(0.631)
University education	-0.940	-0.0525	2.432**
	(3.073)	(1.948)	(0.994)
Married/Cohabitting	-1.555	1.341	-0.289
	(1.332)	(1.002)	(0.398)
Non-labour income (family)	-	-	-
	-	-	-
Log hourly predicted wage rate	28.11	-7.660	4.114
	(21.11)	(15.21)	(6.796)
Log hourly predicted wage rate sq	-19.87	3.149	-2.912
	(14.78)	(10.58)	(4.756)
N. household members	-0.397	-0.318	0.0787
	(0.436)	(0.350)	(0.146)
N. younger child 0-4	-4.325***	2.033**	6.571***
	(1.050)	(0.838)	(0.451)
N. younger child 5-12	-0.572	1.908***	0.689**
	(0.745)	(0.544)	(0.268)
N. younger child 13-17	-0.364	0.601	-0.901***
	(0.898)	(0.699)	(0.300)
Indigenous	4.186***	-0.415	-0.252
	(1.348)	(0.955)	(0.460)
Rural area	-6.135***	3.948***	0.603
	(1.277)	(0.971)	(0.490)
Sector 2	-3.062	0.0703	0.690
	(2.060)	(1.530)	(0.731)
Sector 3	3.112*	-2.376*	0.557
	(1.641)	(1.271)	(0.627)
Sector 4	-0.660	-1.375	0.524
	(1.626)	(1.255)	(0.583)
Region 1	-3.135**	2.606**	1.133**
	(1.530)	(1.124)	(0.497)
Region 2	-3.236**	4.415***	0.0222
	(1.632)	(1.197)	(0.539)
Region 3	0.426	0.0725	1.189**
	(1.832)	(1.200)	(0.554)
Constant	15.43	30.40***	0.782
	(12.31)	(9.722)	(4.582)
R-squared	0.139	0.173	0.439
Observations	1,035	1,035	1,035

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Non-labour income is in US dollars. *Rural area is considered for Mexico, Peru and Ecuador, while Colombia is not considered to be a municipality. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C3. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, and child care in Ecuador

	(1) Paid work	(2) Unpaid work	(3) Child care
Self-employed	-4.857***	6.997***	1.325***
	(0.609)	(0.712)	(0.298)
Age	0.551**	-0.113	-0.289**
	(0.265)	(0.284)	(0.113)
Age squared	-0.570*	0.257	0.135
	(0.326)	(0.357)	(0.131)
Secondary education	0.545	-0.795	0.172
	(1.133)	(1.194)	(0.511)
University education	1.016	-2.724	1.001
	(1.722)	(1.777)	(0.744)
Married/Cohabitting	-0.770	2.386***	-0.0264
	(0.640)	(0.736)	(0.276)
Non-labour income (family)	-0.00203	0.00224	4.43e-05
	(0.00220)	(0.00343)	(0.000785)
Log hourly predicted wage rate	5.005**	1.365	1.076
	(2.065)	(2.165)	(0.861)
Log hourly predicted wage rate sq	-3.717**	0.831	0.00791
	(1.853)	(1.862)	(0.762)
N. household members	0.00257	-0.946***	-0.0604
	(0.231)	(0.275)	(0.0957)
N. younger child 0-4	-0.945*	2.629***	4.920***
	(0.574)	(0.637)	(0.307)
N. younger child 5-12	-0.721*	2.486***	1.809***
	(0.375)	(0.455)	(0.186)
N. younger child 13-17	-0.878*	0.227	-0.975***
	(0.462)	(0.545)	(0.215)
Indigenous	2.540**	-0.274	-0.681
	(0.987)	(1.237)	(0.461)
Rural area	0.0462	5.406***	-0.332
	(0.715)	(0.774)	(0.319)
Sector 2	1.906*	-5.605***	0.477
	(1.122)	(1.300)	(0.516)
Sector 3	7.190***	-6.295***	0.275
	(0.962)	(1.090)	(0.393)
Sector 4	1.336	-5.110***	0.541
	(0.864)	(1.092)	(0.394)
Region 1	-1.876**	5.672***	0.870**
	(0.743)	(0.899)	(0.358)
Region 2	-6.725***	3.374***	0.258
	(0.911)	(1.021)	(0.421)
Constant	30.80***	29.42***	11.90***
	(5.001)	(5.290)	(2.277)
R-squared	0.070	0.135	0.326
Observations	3,065	3,065	3,065

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Non-labour income is in US dollars. *Rural area is considered for Mexico, Peru and Ecuador, while Colombia is not considered to be a municipality. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C4. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, and child care in Colombia (hours per day)

(Colombia)	(1) Paid work	(2) Unpaid work	(3) Child care
Self-employed	-1.290***	1.001***	0.212***
	(0.0880)	(0.0602)	(0.0244)
Age	0.137***	-0.0261	-0.0328***
	(0.0370)	(0.0253)	(0.0107)
Age squared	-0.182***	0.0576*	0.0199
	(0.0465)	(0.0318)	(0.0126)
Secondary education	-0.0495	0.175*	-0.0107
	(0.154)	(0.0979)	(0.0401)
University education	-0.600***	0.0240	0.0803
	(0.201)	(0.131)	(0.0509)
Married/Cohabitting	-0.416***	0.331***	0.0124
	(0.0993)	(0.0631)	(0.0236)
Non-labour income (family)	-0.000186	-0.000334***	-1.15e-05
	(0.000170)	(0.000120)	(4.44e-05)
Log hourly predicted wage rate	-0.151	-0.117	0.0884***
	(0.122)	(0.0793)	(0.0281)
Log hourly predicted wage rate sq	-0.00607	-0.0919***	0.0327**
	(0.0417)	(0.0336)	(0.0131)
N. household members	0.00383	-0.0635**	0.0304***
	(0.0426)	(0.0269)	(0.0110)
N. younger child 0-4	-0.170	0.235***	1.038***
	(0.104)	(0.0700)	(0.0348)
N. younger child 5-12	-0.143**	0.220***	0.0172
	(0.0672)	(0.0455)	(0.0201)
N. younger child 13-17	0.0262	0.0894*	-0.146***
	(0.0834)	(0.0538)	(0.0204)
Indigenous	-0.567***	0.122	-0.00873
	(0.201)	(0.128)	(0.0522)
Rural area	-0.883***	0.708***	-0.0268
	(0.159)	(0.100)	(0.0398)
Sector 2	0.281	-0.0210	0.0641
	(0.238)	(0.176)	(0.0617)
Sector 3	0.731***	-0.200	0.0671
	(0.229)	(0.170)	(0.0563)
Sector 4	0.0385	-0.0166	0.0899
	(0.220)	(0.163)	(0.0568)
Region 1	-0.446***	0.0573	-0.0404
	(0.130)	(0.0808)	(0.0353)
Region 2	-0.0319	0.0987	-0.0496
	(0.123)	(0.0826)	(0.0331)
Region 3	0.233*	0.180**	0.0534
	(0.125)	(0.0858)	(0.0366)
Region 4	-0.212	0.166*	-0.0238
	(0.145)	(0.0930)	(0.0360)
Region 5	0.407*	-0.379***	-0.287***
	(0.217)	(0.139)	(0.0506)
Constant	1.388*	3.730***	1.099***
	(0.742)	(0.508)	(0.226)
R-squared	0.191	0.091	0.328
Observations	8,273	8,273	8,273

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Non-labour income is in US dollars. *Rural area is considered for Mexico, Peru and Ecuador, while Colombia is not considered to be a municipality. We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C5. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, and child care considering children age range in Mexico

VARIABLES	(1) Paid work	(2) Unpaid work	(3) Child care	(4) Paid work	(5) Unpaid work	(6) Child care	(7) Paid work	(8) Unpaid work	(9) Child care
	Age range 0-4			Age range 5-12			Age range 13-17		
Self-employed	-10.12***	7.910***	2.769***	-7.466***	6.568***	2.066***	-6.031***	6.633***	0.783**
	(1.407)	(1.394)	(0.754)	(0.969)	(0.871)	(0.399)	(1.063)	(0.947)	(0.306)
Age	0.483	1.451**	0.0823	-0.204	0.531	-1.050***	-0.285	0.281	-0.870***
	(0.650)	(0.620)	(0.525)	(0.375)	(0.430)	(0.142)	(0.475)	(0.505)	(0.229)
Age squared	-0.670	-2.151**	-0.445	0.361	-0.720	0.792***	0.275	-0.217	0.693***
	(0.946)	(0.918)	(0.803)	(0.469)	(0.545)	(0.165)	(0.538)	(0.584)	(0.258)
Secondary education	-0.794	-1.724	-1.456	-1.610	-1.582	1.468**	-1.236	-2.823*	0.434
	(2.034)	(1.920)	(1.063)	(1.430)	(1.398)	(0.618)	(1.585)	(1.659)	(0.558)
University education	-3.977	-4.231	-0.927	-4.980**	-4.910**	1.851**	-7.451***	-3.042	0.396
	(2.886)	(2.708)	(1.511)	(1.946)	(2.072)	(0.831)	(2.338)	(2.593)	(0.806)
Married/Cohabitting	-3.492**	4.917***	0.394	-4.764***	2.574***	-0.166	-4.610***	3.879***	-0.641*
	(1.378)	(1.583)	(0.899)	(1.024)	(0.960)	(0.420)	(1.052)	(1.017)	(0.334)
Non-labour income	-0.0173**	0.00616	0.00141	-0.00899**	-0.000600	-0.00112	-0.00346	0.00546	0.000315
(family)	(0.00727)	(0.00971)	(0.00427)	(0.00448)	(0.00596)	(0.00132)	(0.00396)	(0.00500)	(0.00102)
Log hourly predicted	0.165	0.966	2.894***	1.153	-1.352	2.316***	2.481	-1.407	1.284***
wage rate	(2.128)	(1.918)	(0.957)	(1.342)	(1.415)	(0.476)	(1.542)	(1.653)	(0.436)
Log hourly predicted	1.453	-1.426	1.157	-0.287	3.003*	0.305	2.712	1.520	0.393
wage rate sq	(2.112)	(1.665)	(0.906)	(1.467)	(1.567)	(0.510)	(1.892)	(2.051)	(0.549)
N. household members	-0.617	0.441	0.199	-0.448	0.453	0.797***	-0.710**	0.199	1.107***
	(0.435)	(0.523)	(0.231)	(0.324)	(0.339)	(0.136)	(0.309)	(0.347)	(0.108)
Indigenous	-0.641	0.165	1.221	-0.659	0.180	0.317	0.0231	1.074	0.309
	(2.950)	(2.701)	(1.417)	(1.915)	(1.669)	(0.835)	(1.895)	(1.862)	(0.715)
Rural area	-2.200	8.766***	0.550	-2.298**	8.386***	0.160	-2.934**	7.733***	0.735*
	(1.735)	(1.629)	(0.844)	(1.171)	(1.198)	(0.500)	(1.233)	(1.299)	(0.414)
Sector 2	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
Sector 3	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
Sector 4	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
Region 1	-1.528	2.148	-1.725**	-1.542	2.596**	-1.179**	-0.688	3.469***	-0.700*
	(1.508)	(1.492)	(0.807)	(1.082)	(1.109)	(0.463)	(1.156)	(1.249)	(0.375)
Region 2	-0.503	0.346	-1.715**	-0.388	0.639	-1.219**	-0.745	0.882	-0.202
	(1.368)	(1.480)	(0.851)	(1.074)	(1.039)	(0.490)	(1.217)	(1.200)	(0.406)
Region 3	0.919	-3.393*	-0.683	0.0684	-2.314**	-1.170**	2.513*	-2.170*	0.00498
	(1.760)	(1.781)	(0.931)	(1.192)	(1.135)	(0.512)	(1.293)	(1.269)	(0.422)
Constant	37.88***	5.181	12.48	49.40***	20.64**	29.81***	51.90***	22.79**	21.49***
	(10.32)	(9.781)	(8.081)	(7.221)	(8.214)	(2.957)	(10.36)	(10.89)	(4.955)
R-squared	0.098	0.159	0.050	0.072	0.097	0.162	0.071	0.097	0.159
Observations	902	902	902	1,934	1,934	1,934	1,618	1,618	1,618

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. See Appendix II.A for a description of all the activities included in paid work, unpaid work and child care. Time devoted to the activities is measured in hours per week (Mexico, Peru, and Ecuador) and hours per day (Colombia). We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C6. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, and child care considering children age range in Peru

VARIABLES	(1) Paid work	(2) Unpaid work	(3) Child care	(4) Paid work	(5) Unpaid work	(6) Child care	(7) Paid work	(8) Unpaid work	(9) Child care
	Age range 0-4			Age range 5-12			Age range 13-17		
Self-employed	-9.191***	7.784***	2.430**	-9.572***	7.579***	1.686***	-7.439***	6.809***	0.632
	(2.319)	(1.672)	(1.017)	(1.518)	(1.155)	(0.583)	(1.583)	(1.207)	(0.462)
Age	0.237	0.712	0.723*	0.539	-0.479	-0.442	2.115*	-0.111	-1.159***
	(1.003)	(0.735)	(0.396)	(0.869)	(0.637)	(0.314)	(1.201)	(0.789)	(0.394)
Age squared	0.0193	-0.975	-1.320**	-0.183	0.524	0.109	-2.326*	0.160	0.964**
	(1.413)	(1.020)	(0.532)	(1.114)	(0.819)	(0.386)	(1.384)	(0.901)	(0.433)
Secondary education	3.017	0.284	1.593	-0.00550	-1.283	0.381	5.001*	-0.682	-1.449
	(3.449)	(2.282)	(1.517)	(2.688)	(1.666)	(0.908)	(2.917)	(2.057)	(0.902)
University education	4.418	0.208	0.269	-1.803	-1.243	3.101**	-4.405	1.751	0.681
	(4.678)	(3.182)	(2.104)	(4.021)	(2.382)	(1.362)	(4.615)	(3.197)	(1.410)
Married/Cohabitting	-1.830	-0.557	-2.460*	-2.010	0.782	-0.778	-1.966	1.654	-0.881
	(2.454)	(1.795)	(1.307)	(1.762)	(1.298)	(0.677)	(1.679)	(1.301)	(0.568)
Non-labour income (family)	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
Log hourly predicted wage rate	22.42	-11.11	-23.30	69.88**	-21.23	-2.169	-9.550	14.56	-0.564
	(41.75)	(32.02)	(18.52)	(30.94)	(21.82)	(11.16)	(28.86)	(20.80)	(7.644)
Log hourly predicted wage rate sq	-23.38	7.076	17.31	-43.48**	11.45	1.108	3.802	-10.54	1.996
	(28.19)	(21.59)	(12.53)	(21.60)	(15.09)	(7.769)	(20.77)	(14.97)	(5.678)
N. household members	-0.623	0.626	0.178	-0.757*	0.109	0.897***	-1.545***	0.436	0.950***
	(0.573)	(0.452)	(0.295)	(0.441)	(0.361)	(0.218)	(0.417)	(0.331)	(0.187)
Indigenous	-2.393	3.182*	1.150	2.795*	-0.519	0.288	5.238***	0.481	0.0153
	(2.598)	(1.875)	(1.206)	(1.673)	(1.185)	(0.694)	(1.713)	(1.324)	(0.687)
Rural area	-2.541	3.213**	1.187	-4.922***	4.210***	-0.176	-8.763***	5.344***	0.268
	(2.515)	(1.622)	(1.222)	(1.552)	(1.260)	(0.666)	(1.581)	(1.395)	(0.551)
Sector 2	-0.00334	1.302	-0.344	-3.273	1.277	0.915	-0.858	-0.910	1.186
	(3.557)	(2.546)	(1.833)	(2.623)	(2.012)	(1.079)	(2.664)	(2.166)	(0.861)
Sector 3	3.282	-2.260	0.634	3.827*	-3.154**	-0.0639	2.405	-1.143	0.308
	(2.852)	(2.389)	(1.626)	(2.042)	(1.596)	(0.829)	(2.070)	(1.793)	(0.680)
Sector 4	3.028	-4.992**	0.474	0.123	-1.977	0.306	-0.137	-0.875	0.0423
	(2.849)	(2.345)	(1.531)	(2.015)	(1.633)	(0.840)	(1.928)	(1.747)	(0.670)
Region 1	-6.033**	6.103***	2.231*	-3.580*	3.514***	0.627	-4.610**	1.342	0.463
	(2.433)	(1.801)	(1.193)	(1.938)	(1.331)	(0.685)	(1.983)	(1.578)	(0.611)
Region 2	-5.441**	4.993***	-0.490	-2.226	4.444***	-0.396	-5.758***	4.079**	0.547
	(2.739)	(1.720)	(1.282)	(2.022)	(1.381)	(0.752)	(2.058)	(1.733)	(0.706)
Region 3	-5.260*	1.330	2.258	0.249	0.782	1.541*	-3.405	-0.608	0.759
	(2.870)	(1.996)	(1.398)	(2.412)	(1.541)	(0.832)	(2.501)	(1.683)	(0.743)
Constant	30.41	17.71	8.033	2.632	48.34***	17.23**	10.77	21.91	29.70***
	(23.24)	(18.18)	(9.865)	(19.52)	(15.82)	(7.755)	(25.10)	(17.73)	(8.612)
R-squared	0.107	0.248	0.091	0.125	0.181	0.174	0.159	0.162	0.225
Observations	330	330	330	670	670	670	594	594	594

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. See Appendix II.A for a description of all the activities included in paid work, unpaid work and child care. Time devoted to the activities is measured in hours per week (Mexico, Peru, and Ecuador) and hours per day (Colombia). We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C7. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, and child care considering children age range in Ecuador

VARIABLES	(1) Paid work	(2) Unpaid work	(3) Child care	(4) Paid work	(5) Unpaid work	(6) Child care	(7) Paid work	(8) Unpaid work	(9) Child care
	Age range 0-4			Age range 5-12			Age range 13-17		
Self-employed	-7.268***	8.211***	1.822***	-4.881***	7.372***	2.226***	-5.672***	7.379***	1.689***
	(1.093)	(1.180)	(0.639)	(0.750)	(0.825)	(0.409)	(0.875)	(1.033)	(0.410)
Age	0.119	0.989*	0.818***	0.695*	-0.352	-0.810***	0.907*	0.150	-1.012***
	(0.496)	(0.544)	(0.286)	(0.368)	(0.393)	(0.158)	(0.543)	(0.657)	(0.238)
Age squared	0.242	-1.507*	-1.492***	-0.619	0.386	0.531***	-0.924	-0.181	0.797***
	(0.716)	(0.777)	(0.414)	(0.472)	(0.508)	(0.193)	(0.620)	(0.763)	(0.262)
Secondary education	3.295	1.493	0.194	0.886	0.152	1.061	-0.698	-0.710	0.190
	(2.068)	(1.963)	(1.059)	(1.443)	(1.469)	(0.772)	(1.806)	(1.809)	(0.728)
University education	5.642*	-0.570	0.150	1.544	-1.329	1.600	-0.0708	-3.425	0.434
	(3.246)	(2.863)	(1.584)	(2.174)	(2.172)	(1.096)	(2.821)	(2.626)	(1.060)
Married/Cohabitting	0.502	1.920	-0.917	-0.843	1.747*	-0.329	-1.701*	2.766**	-0.511
	(1.186)	(1.368)	(0.703)	(0.740)	(0.913)	(0.419)	(0.877)	(1.085)	(0.369)
Non-labour income (family)	-0.0101	0.00823	0.00462	-0.00268	-0.00150	-0.000934	-0.000384	0.00199	-0.00114
	(0.00699)	(0.00668)	(0.00281)	(0.00288)	(0.00330)	(0.00128)	(0.00240)	(0.00490)	(0.000814)
Log hourly predicted wage rate	2.745	0.359	0.0927	4.705**	0.133	1.023	5.945*	1.869	-0.903
	(4.127)	(4.134)	(1.642)	(2.285)	(2.240)	(1.010)	(3.536)	(2.585)	(1.046)
Log hourly predicted wage rate sq	-6.329	-2.457	0.900	-4.146*	0.808	0.158	-3.340	1.404	1.615*
	(3.994)	(3.429)	(1.538)	(2.212)	(2.023)	(0.991)	(3.354)	(2.373)	(0.965)
N. household members	-0.534	0.386	0.482**	-0.414*	-0.126	0.527***	-0.301	-0.289	0.923***
	(0.377)	(0.431)	(0.207)	(0.220)	(0.277)	(0.116)	(0.226)	(0.267)	(0.0968)
Indigenous	2.553	1.359	-0.443	3.264***	-0.727	0.221	2.452*	0.496	0.0217
	(1.658)	(2.158)	(0.908)	(1.166)	(1.513)	(0.669)	(1.284)	(1.710)	(0.587)
Rural area	1.079	4.922***	-0.137	-0.350	5.252***	-0.691	-0.523	5.854***	-0.0919
	(1.323)	(1.428)	(0.704)	(0.823)	(0.962)	(0.458)	(1.034)	(1.087)	(0.411)
Sector 2	1.141	-1.151	1.341	3.422***	-5.703***	-0.272	3.042*	-8.590***	-0.678
	(1.989)	(2.406)	(1.203)	(1.320)	(1.549)	(0.733)	(1.605)	(1.832)	(0.649)
Sector 3	9.593***	-3.157	1.253	7.709***	-7.623***	-0.615	5.725***	-5.754***	0.344
	(1.685)	(1.988)	(0.936)	(1.159)	(1.360)	(0.613)	(1.277)	(1.460)	(0.554)
Sector 4	1.388	-0.525	2.714***	1.960*	-6.190***	0.171	0.0481	-5.021***	-0.123
	(1.528)	(1.898)	(0.882)	(1.010)	(1.212)	(0.543)	(1.180)	(1.438)	(0.496)
Region 1	-1.055	6.039***	0.902	-1.691*	5.402***	0.647	-2.274**	5.923***	-0.0614
	(1.226)	(1.519)	(0.793)	(0.923)	(1.042)	(0.490)	(1.076)	(1.291)	(0.476)
Region 2	-4.545***	1.512	-0.882	-6.578***	2.594**	0.128	-7.148***	4.696***	-0.574
	(1.502)	(1.648)	(0.935)	(1.091)	(1.166)	(0.572)	(1.297)	(1.477)	(0.554)
Constant	37.21***	12.06	-1.066	26.17***	39.82***	27.04***	23.46**	24.10*	27.70***
	(8.113)	(9.054)	(4.700)	(6.755)	(7.100)	(3.042)	(11.51)	(13.34)	(5.167)
R-squared	0.103	0.152	0.058	0.075	0.125	0.135	0.074	0.117	0.175
Observations	938	938	938	2,069	2,069	2,069	1,581	1,581	1,581

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. See Appendix II.A for a description of all the activities included in paid work, unpaid work and child care. Time devoted to the activities is measured in hours per week (Mexico, Peru, and Ecuador) and hours per day (Colombia). We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C8. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, and child care considering children age range in Colombia (hours per day)

VARIABLES	(1) Paid work	(2) Unpaid work	(3) Child care	(4) Paid work	(5) Unpaid work	(6) Child care	(7) Paid work	(8) Unpaid work	(9) Child care
		Age range 0-4			Age range 5-12			Age range 13-17	
Self-employed	-1.481***	1.084***	0.527***	-1.239***	0.989***	0.245***	-1.284***	0.980***	0.127***
	(0.164)	(0.118)	(0.0666)	(0.118)	(0.0808)	(0.0345)	(0.131)	(0.0876)	(0.0289)
Age	0.145	-0.00553	0.000506	0.110**	-0.0255	-0.124***	0.184**	0.00218	-0.101***
	(0.0893)	(0.0633)	(0.0323)	(0.0545)	(0.0390)	(0.0165)	(0.0766)	(0.0500)	(0.0168)
Age squared	-0.173	0.0271	-0.0379	-0.146**	0.0419	0.105***	-0.221**	0.0167	0.0863***
	(0.133)	(0.0970)	(0.0482)	(0.0702)	(0.0509)	(0.0209)	(0.0878)	(0.0584)	(0.0183)
Secondary education	0.260	0.0420	-0.158	-0.0466	0.135	-0.0485	0.133	0.113	-0.0720
	(0.309)	(0.201)	(0.115)	(0.196)	(0.129)	(0.0563)	(0.228)	(0.149)	(0.0482)
University education	-0.0875	-0.213	0.0445	-0.699***	0.00402	0.0184	-0.404	0.0102	-0.0287
	(0.426)	(0.276)	(0.155)	(0.260)	(0.175)	(0.0780)	(0.293)	(0.191)	(0.0609)
Married/Cohabitting	-0.539**	0.341**	0.198**	-0.403***	0.402***	0.00232	-0.433***	0.281***	-0.0718***
	(0.216)	(0.142)	(0.0774)	(0.131)	(0.0823)	(0.0337)	(0.135)	(0.0893)	(0.0267)
Non-labour income	0.000136	-0.00076***	0.000249	-0.000285	-0.00034**	-7.08e-05	-5.14e-05	-0.000214	-9.06e-05*
(family)	(0.000456)	(0.000239)	(0.000179)	(0.000221)	(0.000159)	(5.29e-05)	(0.000245)	(0.000173)	(4.69e-05)
Log hourly predicted	-0.433*	-0.128	0.254***	0.00636	-0.207**	0.159***	-0.401**	0.0197	0.120***
wage rate	(0.262)	(0.176)	(0.0885)	(0.158)	(0.104)	(0.0404)	(0.165)	(0.106)	(0.0337)
Log hourly predicted	-0.0319	-0.0956	0.0886**	0.0306	-0.0939**	0.0623***	-0.0219	-0.0720	0.0363**
wage rate sq	(0.0870)	(0.0740)	(0.0347)	(0.0530)	(0.0454)	(0.0209)	(0.0701)	(0.0558)	(0.0159)
N. household	-0.0738	-0.00646	-0.0460*	-0.0405	-0.0169	0.106***	-0.0434	0.0213	0.122***
members	(0.0659)	(0.0455)	(0.0259)	(0.0460)	(0.0293)	(0.0134)	(0.0484)	(0.0301)	(0.0111)
Indigenous	-0.468	-0.00964	0.0173	-0.403	0.0595	0.0713	-0.731**	0.142	-0.00940
	(0.347)	(0.239)	(0.132)	(0.256)	(0.161)	(0.0819)	(0.307)	(0.195)	(0.0721)
Rural area	-0.845***	0.787***	-0.0327	-0.893***	0.857***	0.00123	-1.023***	0.592***	0.0515
	(0.269)	(0.178)	(0.102)	(0.198)	(0.131)	(0.0565)	(0.233)	(0.147)	(0.0487)
Sector 2	0.0981	-0.00531	0.0570	-0.167	0.383*	0.0391	0.285	-0.337	0.0534
	(0.388)	(0.301)	(0.153)	(0.295)	(0.204)	(0.0817)	(0.320)	(0.222)	(0.0700)
Sector 3	0.733*	-0.154	0.0877	0.467	0.146	0.0100	0.664**	-0.410*	0.0801
	(0.385)	(0.288)	(0.143)	(0.285)	(0.204)	(0.0781)	(0.306)	(0.219)	(0.0661)
Sector 4	0.0856	0.0648	0.121	-0.364	0.348*	0.0312	-0.0247	-0.318	0.0646
	(0.371)	(0.285)	(0.143)	(0.274)	(0.195)	(0.0764)	(0.299)	(0.208)	(0.0646)
Region 1	-0.678***	-0.00764	-0.187**	-0.433**	-0.0226	0.0607	-0.566***	0.146	-0.0418
	(0.243)	(0.158)	(0.0946)	(0.176)	(0.107)	(0.0510)	(0.196)	(0.120)	(0.0421)
Region 2	0.146	-0.224	-0.203**	0.0528	0.0851	-0.0823*	-0.247	0.152	-0.0827**
	(0.237)	(0.164)	(0.0959)	(0.164)	(0.107)	(0.0486)	(0.181)	(0.128)	(0.0389)
Region 3	0.460*	-0.0434	0.0426	0.210	0.137	0.107**	0.161	0.158	-0.0315
	(0.244)	(0.159)	(0.102)	(0.175)	(0.112)	(0.0537)	(0.189)	(0.125)	(0.0444)
Region 4	-0.216	0.0371	-0.213**	-0.298	0.115	-0.0191	-0.188	0.0811	0.00562
	(0.262)	(0.187)	(0.0927)	(0.184)	(0.127)	(0.0496)	(0.209)	(0.132)	(0.0443)
Region 5	0.202	-0.471	-0.673***	0.418	-0.377*	-0.195***	0.399	-0.594***	-0.158***
	(0.478)	(0.294)	(0.143)	(0.297)	(0.196)	(0.0733)	(0.308)	(0.192)	(0.0451)
Constant	1.369	3.712***	2.057***	2.043*	3.938***	3.054***	0.661	3.341***	2.323***
	(1.520)	(1.011)	(0.549)	(1.046)	(0.760)	(0.331)	(1.679)	(1.069)	(0.380)
R-squared	0.202	0.111	0.074	0.193	0.096	0.099	0.178	0.077	0.100
Observations	2,339	2,339	2,339	4,878	4,878	4,878	3,925	3,925	3,925

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. See Appendix II.A for a description of all the activities included in paid work, unpaid work and child care. Time devoted to the activities is measured in hours per week (Mexico, Peru, and Ecuador) and hours per day (Colombia). We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C9. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, non-educational child care and educational child care in Mexico

	(1)	(2)	(3)	(4)
	Paid work	Unpaid work	Non-educational child care	Educational child care
Self-employed	-6.896***	6.336***	0.360*	0.800***
	(0.770)	(0.716)	(0.215)	(0.148)
Age	-0.283	0.346	-0.307***	-0.0118
	(0.252)	(0.224)	(0.0764)	(0.0486)
Age squared	0.311	-0.261	0.260***	-0.0381
	(0.307)	(0.274)	(0.0870)	(0.0575)
Secondary education	-2.507**	-1.746	-0.00629	0.718***
	(1.091)	(1.072)	(0.310)	(0.251)
University education	-7.072***	-3.347**	0.568	0.341
	(1.501)	(1.512)	(0.434)	(0.305)
Married/Cohabitting	-4.570***	3.983***	-0.123	0.0910
	(0.805)	(0.800)	(0.213)	(0.160)
Non-labour income (family)	-0.00722**	0.000466	-0.000808	0.000366
	(0.00293)	(0.00405)	(0.000518)	(0.000523)
Log hourly predicted wage rate	2.480**	-1.144	0.482*	0.930***
	(1.047)	(1.101)	(0.279)	(0.200)
Log hourly predicted wage rate sq	2.060*	1.453	-0.175	0.390*
	(1.101)	(1.176)	(0.283)	(0.206)
N. household members	-0.252	-0.744**	0.179**	-0.189***
	(0.296)	(0.328)	(0.0777)	(0.0512)
N. younger child 0-4	-0.797	1.639**	6.306***	0.375**
	(0.736)	(0.660)	(0.288)	(0.147)
N. younger child 5-12	-1.231***	2.842***	-0.113	1.988***
	(0.456)	(0.460)	(0.138)	(0.100)
N. younger child 13-17	0.461	1.663***	-0.576***	-0.257**
	(0.560)	(0.595)	(0.139)	(0.112)
Indigenous	-0.407	1.295	0.618	-0.411
	(1.492)	(1.430)	(0.419)	(0.289)
Rural area	-2.120**	7.181***	0.143	-0.364**
	(0.933)	(0.870)	(0.265)	(0.173)
Sector 2	-	-	-	-
	-	-	-	-
Sector 3	-	-	-	-
	-	-	-	-
Sector 4	-	-	-	-
	-	-	-	-
Region 1	-1.020	2.510***	-0.268	-0.974***
	(0.828)	(0.865)	(0.239)	(0.187)
Region 2	-0.275	0.776	-0.0874	-1.018***
	(0.792)	(0.842)	(0.260)	(0.193)
Region 3	0.999	-2.056**	-0.179	-0.453**
	(0.953)	(0.870)	(0.257)	(0.212)
Constant	50.51***	20.92***	8.716***	2.535**
	(4.913)	(4.476)	(1.680)	(0.991)
R-squared	0.074	0.105	0.434	0.244
Observations	3,063	3,063	3,063	3,063

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Non-labour income is in US dollars. *Rural area is considered for Mexico, Peru and Ecuador, while Colombia is not considered to be a municipality. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C10. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, non-educational child care and educational child care in Peru

	(1) Paid work	(2) Unpaid work	(3) Non-educational child care	(4) Educational child care
Self-employed	-8.631***	7.110***	0.798***	0.262
	(1.203)	(0.881)	(0.271)	(0.264)
Age	0.945*	-0.0583	-0.111	0.204*
	(0.572)	(0.400)	(0.145)	(0.106)
Age squared	-0.947	0.139	0.0488	-0.323***
	(0.719)	(0.492)	(0.170)	(0.124)
Secondary education	3.185	-0.718	0.195	0.593
	(2.083)	(1.355)	(0.482)	(0.407)
University education	-0.940	-0.0525	0.702	1.730***
	(3.091)	(1.934)	(0.726)	(0.605)
Married/Cohabitting	-1.555	1.341	-0.202	-0.0878
	(1.327)	(1.004)	(0.290)	(0.277)
Non-labour income (family)	-	-	-	-
	-	-	-	-
Log hourly predicted wage rate	28.11	-7.660	3.380	0.734
	(21.28)	(15.12)	(4.785)	(4.127)
Log hourly predicted wage rate sq	-19.87	3.149	-2.354	-0.558
	(14.94)	(10.51)	(3.344)	(2.945)
N. household members	-0.397	-0.318	0.166	-0.0872
	(0.438)	(0.350)	(0.105)	(0.0895)
N. younger child 0-4	-4.325***	2.033**	5.099***	1.472***
	(1.054)	(0.837)	(0.359)	(0.297)
N. younger child 5-12	-0.572	1.908***	-0.131	0.819***
	(0.745)	(0.549)	(0.227)	(0.152)
N. younger child 13-17	-0.364	0.601	-0.324	-0.577***
	(0.904)	(0.699)	(0.239)	(0.185)
Indigenous	4.186***	-0.415	0.0736	-0.326
	(1.337)	(0.951)	(0.344)	(0.325)
Rural area	-6.135***	3.948***	0.495	0.108
	(1.274)	(0.972)	(0.369)	(0.291)
Sector 2	-3.062	0.0703	-0.211	0.901**
	(2.065)	(1.518)	(0.551)	(0.459)
Sector 3	3.112*	-2.376*	-0.124	0.681**
	(1.648)	(1.281)	(0.496)	(0.343)
Sector 4	-0.660	-1.375	-0.228	0.752**
	(1.626)	(1.258)	(0.442)	(0.354)
Region 1	-3.135**	2.606**	0.475	0.658**
	(1.522)	(1.126)	(0.362)	(0.320)
Region 2	-3.236**	4.415***	0.128	-0.106
	(1.642)	(1.190)	(0.408)	(0.328)
Region 3	0.426	0.0725	0.335	0.854**
	(1.843)	(1.202)	(0.377)	(0.400)
Constant	15.43	30.40***	2.351	-1.569
	(12.52)	(9.702)	(3.590)	(2.683)
R-squared	0.139	0.173	0.427	0.210
Observations	1,035	1,035	1,035	1,035

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Non-labour income is in US dollars. *Rural area is considered for Mexico, Peru and Ecuador, while Colombia is not considered to be a municipality. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C11. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, non-educational child care and educational child care in Ecuador

	(1) Paid work	(2) Unpaid work	(3) Non-educational child care	(4) Educational child care
Self-employed	-4.857***	6.997***	0.252	1.072***
	(0.609)	(0.712)	(0.161)	(0.213)
Age	0.551**	-0.113	-0.109*	-0.179**
	(0.265)	(0.284)	(0.0639)	(0.0797)
Age squared	-0.570*	0.257	0.0525	0.0824
	(0.326)	(0.357)	(0.0730)	(0.0933)
Secondary education	0.545	-0.795	-0.250	0.422
	(1.133)	(1.194)	(0.275)	(0.371)
University education	1.016	-2.724	-0.0276	1.028*
	(1.722)	(1.777)	(0.400)	(0.554)
Married/Cohabitting	-0.770	2.386***	-0.0508	0.0244
	(0.640)	(0.736)	(0.148)	(0.200)
Non-labour income (family)	-0.00203	0.00224	-0.000464	0.000509
	(0.00220)	(0.00343)	(0.000308)	(0.000671)
Log hourly predicted wage rate	5.005**	1.365	-0.0418	1.118*
	(2.065)	(2.165)	(0.546)	(0.571)
Log hourly predicted wage rate sq	-3.717**	0.831	0.213	-0.205
	(1.853)	(1.862)	(0.459)	(0.520)
N. household members	0.00257	-0.946***	0.0588	-0.119*
	(0.231)	(0.275)	(0.0460)	(0.0717)
N. younger child 0-4	-0.945*	2.629***	3.872***	1.048***
	(0.574)	(0.637)	(0.173)	(0.206)
N. younger child 5-12	-0.721*	2.486***	0.234**	1.575***
	(0.375)	(0.455)	(0.100)	(0.129)
N. younger child 13-17	-0.878*	0.227	-0.449***	-0.526***
	(0.462)	(0.545)	(0.110)	(0.151)
Indigenous	2.540**	-0.274	0.201	-0.882***
	(0.987)	(1.237)	(0.267)	(0.298)
Rural area	0.0462	5.406***	-0.0346	-0.297
	(0.715)	(0.774)	(0.168)	(0.229)
Sector 2	1.906*	-5.605***	-0.158	0.635*
	(1.122)	(1.300)	(0.278)	(0.370)
Sector 3	7.190***	-6.295***	-0.0142	0.289
	(0.962)	(1.090)	(0.216)	(0.272)
Sector 4	1.336	-5.110***	0.0209	0.520*
	(0.864)	(1.092)	(0.211)	(0.274)
Region 1	-1.876**	5.672***	0.263	0.606**
	(0.743)	(0.899)	(0.200)	(0.241)
Region 2	-6.725***	3.374***	-0.170	0.428
	(0.911)	(1.021)	(0.229)	(0.294)
Constant	30.80***	29.42***	4.599***	7.300***
	(5.001)	(5.290)	(1.300)	(1.587)
R-squared	0.070	0.135	0.369	0.199
Observations	3,065	3,065	3,065	3,065

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Non-labour income is in US dollars. *Rural area is considered for Mexico, Peru and Ecuador, while Colombia is not considered to be a municipality. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C12. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, non-educational child care and educational child care in Colombia (hours per day)

(Colombia)	(1) Paid work	(2) Unpaid work	(3) Non-educational child care	(4) Educational child care
Self-employed	-1.290***	1.001***	0.109***	0.103***
	(0.0895)	(0.0590)	(0.0123)	(0.0180)
Age	0.137***	-0.0261	-0.0215***	-0.0113
	(0.0359)	(0.0249)	(0.00613)	(0.00772)
Age squared	-0.182***	0.0576*	0.0186***	0.00137
	(0.0450)	(0.0316)	(0.00717)	(0.00896)
Secondary education	-0.0495	0.175*	-0.00208	-0.00859
	(0.153)	(0.0998)	(0.0215)	(0.0278)
University education	-0.600***	0.0240	0.0375	0.0428
	(0.195)	(0.133)	(0.0283)	(0.0375)
Married/Cohabitting	-0.416***	0.331***	0.0172	-0.00472
	(0.0946)	(0.0627)	(0.0119)	(0.0174)
Non-labour income (family)	-0.000186	-0.000334***	-1.66e-05	5.11e-06
	(0.000170)	(0.000122)	(2.08e-05)	(3.34e-05)
Log hourly predicted wage rate	-0.151	-0.117	0.0193	0.0691***
	(0.122)	(0.0764)	(0.0147)	(0.0207)
Log hourly predicted wage rate sq	-0.00607	-0.0919***	0.00817	0.0245***
	(0.0407)	(0.0348)	(0.00843)	(0.00936)
N. household members	0.00383	-0.0635**	0.0104*	0.0199**
	(0.0425)	(0.0274)	(0.00535)	(0.00778)
N. younger child 0-4	-0.170	0.235***	0.607***	0.430***
	(0.104)	(0.0689)	(0.0196)	(0.0251)
N. younger child 5-12	-0.143**	0.220***	-0.00955	0.0268*
	(0.0693)	(0.0474)	(0.00994)	(0.0142)
N. younger child 13-17	0.0262	0.0894	-0.0504***	-0.0956***
	(0.0808)	(0.0558)	(0.0101)	(0.0141)
Indigenous	-0.567***	0.122	-0.0180	0.00929
	(0.205)	(0.132)	(0.0286)	(0.0410)
Rural area	-0.883***	0.708***	0.00783	-0.0346
	(0.158)	(0.0991)	(0.0198)	(0.0294)
Sector 2	0.281	-0.0210	0.0379	0.0262
	(0.238)	(0.166)	(0.0309)	(0.0435)
Sector 3	0.731***	-0.200	0.0696**	-0.00256
	(0.228)	(0.157)	(0.0297)	(0.0417)
Sector 4	0.0385	-0.0166	0.0557*	0.0342
	(0.221)	(0.154)	(0.0287)	(0.0408)
Region 1	-0.446***	0.0573	0.0100	-0.0505**
	(0.137)	(0.0865)	(0.0185)	(0.0253)
Region 2	-0.0319	0.0987	-0.0415**	-0.00813
	(0.122)	(0.0827)	(0.0173)	(0.0254)
Region 3	0.233*	0.180**	0.0307	0.0227
	(0.125)	(0.0841)	(0.0199)	(0.0264)
Region 4	-0.212	0.166*	-0.0436**	0.0198
	(0.142)	(0.0975)	(0.0178)	(0.0264)
Region 5	0.407*	-0.379***	-0.0949***	-0.192***
	(0.223)	(0.136)	(0.0309)	(0.0361)
Constant	1.388*	3.730***	0.540***	0.559***
	(0.724)	(0.496)	(0.129)	(0.167)
R-squared	0.191	0.091	0.364	0.161
Observations	8,273	8,273	8,273	8,273

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Non-labour income is in US dollars. *Rural area is considered for Mexico, Peru and Ecuador, while Colombia is not considered to be a municipality. We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C13. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, non-educational child care and educational child care in Mexico

	(1) Paid work	(2) Unpaid work	(3) Non-educational child care	(4) Educational child care
Self-employed	-6.872***	7.040***	0.265	0.508***
	(0.934)	(0.860)	(0.242)	(0.164)
Age	-0.284	0.334	-0.306***	-0.00843
	(0.253)	(0.225)	(0.0766)	(0.0484)
Age squared	0.311	-0.252	0.259***	-0.0412
	(0.307)	(0.275)	(0.0871)	(0.0571)
Secondary education	-2.586**	-1.345	-0.249	0.279
	(1.115)	(1.187)	(0.334)	(0.268)
University education	-6.984***	-2.612*	0.597	0.221
	(1.520)	(1.576)	(0.461)	(0.314)
Secondary education*self-employed	0.281	-1.182	0.814	1.440***
	(2.120)	(1.717)	(0.579)	(0.462)
University education*self-employed	-0.489	-3.706*	-0.238	0.472
	(2.062)	(2.096)	(0.699)	(0.509)
Married/Cohabitting	-4.578***	3.930***	-0.128	0.0954
	(0.804)	(0.800)	(0.215)	(0.160)
Non-labour income (family)	-0.00718**	0.000746	-0.000784	0.000338
	(0.00294)	(0.00394)	(0.000518)	(0.000525)
Log hourly predicted wage rate	2.476**	-1.137	0.474*	0.917***
	(1.047)	(1.104)	(0.278)	(0.200)
Log hourly predicted wage rate sq	2.056*	1.446	-0.181	0.382*
	(1.101)	(1.184)	(0.283)	(0.207)
N. household members	-0.252	-0.741**	0.179**	-0.189***
	(0.296)	(0.329)	(0.0778)	(0.0510)
N. younger child 0-4	-0.799	1.625**	6.304***	0.375**
	(0.736)	(0.661)	(0.288)	(0.146)
N. younger child 5-12	-1.235***	2.834***	-0.119	1.981***
	(0.457)	(0.460)	(0.139)	(0.101)
N. younger child 13-17	0.460	1.659***	-0.576***	-0.257**
	(0.560)	(0.596)	(0.140)	(0.111)
Indigenous	-0.410	1.237	0.622	-0.393
	(1.493)	(1.432)	(0.419)	(0.288)
Rural area	-2.128**	7.120***	0.139	-0.357**
	(0.932)	(0.871)	(0.265)	(0.174)
Sector 2	-	-	-	-
	-	-	-	-
Sector 3	-	-	-	-
	-	-	-	-
Sector 4	-	-	-	-
	-	-	-	-
Region 1	-1.011	2.562***	-0.259	-0.972***
	(0.830)	(0.865)	(0.239)	(0.186)
Region 2	-0.273	0.798	-0.0877	-1.023***
	(0.791)	(0.841)	(0.260)	(0.192)
Region 3	0.997	-2.095**	-0.174	-0.437**
	(0.953)	(0.872)	(0.257)	(0.211)
Constant	50.53***	20.98***	8.755***	2.577***
	(4.914)	(4.486)	(1.682)	(0.986)
R-squared	0.074	0.106	0.435	0.247
Observations	3,063	3,063	3,063	3,063

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Non-labour income is in US dollars. *Rural area is considered for Mexico, Peru and Ecuador, while Colombia is not considered to be a municipality. We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C14. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, non-educational child care and educational child care in Peru

	(1) Paid work	(2) Unpaid work	(3) Non-educational child care	(4) Educational child care
Self-employed	-8.839***	6.896***	0.942***	0.509
	(1.554)	(1.200)	(0.364)	(0.341)
Age	0.951*	-0.0438	-0.110	0.206*
	(0.571)	(0.398)	(0.145)	(0.107)
Age squared	-0.953	0.123	0.0464	-0.327***
	(0.719)	(0.490)	(0.170)	(0.125)
Secondary education	3.089	-0.470	0.470	1.063*
	(2.631)	(1.855)	(0.578)	(0.570)
University education	-1.356	-0.799	0.798	1.897***
	(3.394)	(2.272)	(0.792)	(0.687)
Secondary education*self-employed	0.119	-0.434	-0.419	-0.714
	(2.701)	(1.968)	(0.575)	(0.593)
University education*self-employed	0.805	1.496	-0.154	-0.269
	(3.036)	(2.003)	(0.644)	(0.644)
Married/Cohabitting	-1.567	1.336	-0.189	-0.0659
	(1.337)	(1.000)	(0.291)	(0.278)
Non-labour income (family)	-	-	-	-
	-	-	-	-
Log hourly predicted wage rate	27.64	-8.830	3.290	0.586
	(21.39)	(15.39)	(4.814)	(4.052)
Log hourly predicted wage rate sq	-19.53	3.996	-2.295	-0.461
	(15.00)	(10.73)	(3.364)	(2.894)
N. household members	-0.398	-0.330	0.160	-0.0979
	(0.440)	(0.353)	(0.107)	(0.0934)
N. younger child 0-4	-4.304***	2.085**	5.103***	1.478***
	(1.062)	(0.844)	(0.362)	(0.297)
N. younger child 5-12	-0.574	1.908***	-0.128	0.823***
	(0.745)	(0.544)	(0.228)	(0.152)
N. younger child 13-17	-0.375	0.576	-0.324	-0.578***
	(0.904)	(0.701)	(0.240)	(0.185)
Indigenous	4.188***	-0.404	0.0786	-0.317
	(1.349)	(0.956)	(0.347)	(0.326)
Rural area	-6.126***	3.938***	0.478	0.0778
	(1.274)	(0.973)	(0.374)	(0.289)
Sector 2	-3.047	0.0635	-0.235	0.859*
	(2.059)	(1.532)	(0.549)	(0.463)
Sector 3	3.140*	-2.339*	-0.138	0.656*
	(1.645)	(1.278)	(0.497)	(0.338)
Sector 4	-0.573	-1.224	-0.251	0.712**
	(1.651)	(1.270)	(0.446)	(0.345)
Region 1	-3.167**	2.552**	0.483	0.672**
	(1.534)	(1.125)	(0.370)	(0.322)
Region 2	-3.233**	4.407***	0.119	-0.121
	(1.632)	(1.199)	(0.408)	(0.333)
Region 3	0.397	0.00497	0.333	0.850**
	(1.831)	(1.199)	(0.380)	(0.398)
Constant	15.57	30.64***	2.311	-1.637
	(12.35)	(9.777)	(3.602)	(2.675)
R-squared	0.139	0.174	0.427	0.211
Observations	1,035	1,035	1,035	1,035

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Non-labour income is in US dollars. *Rural area is considered for Mexico, Peru and Ecuador, while Colombia is not considered to be a municipality. We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C15. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, non-educational child care and educational child care in Ecuador

	(1) Paid work	(2) Unpaid work	(3) Non-educational child care	(4) Educational child care
Self-employed	-5.931***	7.217***	0.148	0.708***
	(0.782)	(0.928)	(0.205)	(0.243)
Age	0.550**	-0.114	-0.110*	-0.180**
	(0.265)	(0.284)	(0.0639)	(0.0796)
Age squared	-0.561*	0.256	0.0534	0.0861
	(0.326)	(0.356)	(0.0729)	(0.0930)
Secondary education	-0.357	-0.791	-0.349	0.00966
	(1.254)	(1.412)	(0.330)	(0.422)
University education	-0.665	-2.159	-0.179	0.587
	(1.741)	(1.931)	(0.425)	(0.571)
Secondary education*self-employed	1.477	0.152	0.171	0.768
	(1.511)	(1.640)	(0.352)	(0.514)
University education*self-employed	4.771***	-1.654	0.425	1.225*
	(1.688)	(1.763)	(0.433)	(0.633)
Married/Cohabitting	-0.705	2.369***	-0.0446	0.0449
	(0.641)	(0.736)	(0.149)	(0.199)
Non-labour income (family)	-0.00202	0.00225	-0.000463	0.000518
	(0.00219)	(0.00343)	(0.000308)	(0.000670)
Log hourly predicted wage rate	4.983**	1.391	-0.0426	1.123**
	(2.031)	(2.168)	(0.544)	(0.568)
Log hourly predicted wage rate sq	-3.649**	0.754	0.216	-0.219
	(1.822)	(1.872)	(0.457)	(0.520)
N. household members	-0.00705	-0.945***	0.0579	-0.123*
	(0.231)	(0.274)	(0.0462)	(0.0720)
N. younger child 0-4	-0.939	2.629***	3.873***	1.050***
	(0.574)	(0.637)	(0.173)	(0.206)
N. younger child 5-12	-0.726*	2.484***	0.233**	1.572***
	(0.374)	(0.455)	(0.1000)	(0.130)
N. younger child 13-17	-0.891*	0.235	-0.450***	-0.528***
	(0.463)	(0.546)	(0.110)	(0.151)
Indigenous	2.801***	-0.351	0.225	-0.807***
	(0.989)	(1.249)	(0.267)	(0.301)
Rural area	0.141	5.362***	-0.0269	-0.280
	(0.714)	(0.774)	(0.169)	(0.229)
Sector 2	1.913*	-5.604***	-0.157	0.638*
	(1.122)	(1.300)	(0.278)	(0.370)
Sector 3	7.252***	-6.303***	-0.00787	0.313
	(0.968)	(1.094)	(0.216)	(0.272)
Sector 4	1.690*	-5.213***	0.0537	0.623**
	(0.879)	(1.117)	(0.214)	(0.275)
Region 1	-1.870**	5.651***	0.263	0.597**
	(0.742)	(0.905)	(0.200)	(0.241)
Region 2	-6.618***	3.317***	-0.161	0.444
	(0.910)	(1.027)	(0.231)	(0.293)
Constant	31.14***	29.44***	4.638***	7.471***
	(5.007)	(5.316)	(1.301)	(1.580)
R-squared	0.073	0.135	0.370	0.201
Observations	3,065	3,065	3,065	3,065

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Non-labour income is in US dollars. *Rural area is considered for Mexico, Peru and Ecuador, while Colombia is not considered to be a municipality. We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C16. SUR estimates of the time devoted by employed and self-employed mothers to paid work, unpaid work, non-educational child care and educational child care in Colombia (hours per day)

(Colombia)	(1) Paid work	(2) Unpaid work	(3) Non-educational child care	(4) Educational child care
Self-employed	-1.312***	0.933***	0.106***	0.0669***
	(0.153)	(0.0950)	(0.0170)	(0.0247)
Age	0.137***	-0.0270	-0.0215***	-0.0115
	(0.0359)	(0.0250)	(0.00614)	(0.00770)
Age squared	-0.182***	0.0588*	0.0186***	0.00181
	(0.0450)	(0.0318)	(0.00719)	(0.00894)
Secondary education	-0.000593	0.0497	0.00905	-0.0190
	(0.182)	(0.116)	(0.0241)	(0.0331)
University education	-0.672***	0.0348	0.0244	0.00181
	(0.209)	(0.141)	(0.0292)	(0.0397)
Secondary education*self-employed	-0.132	0.284**	-0.0290	0.0101
	(0.213)	(0.133)	(0.0255)	(0.0378)
University education*self-employed	0.231	-0.0898	0.0430	0.113**
	(0.220)	(0.143)	(0.0325)	(0.0448)
Married/Cohabitting	-0.415***	0.332***	0.0173	-0.00377
	(0.0946)	(0.0627)	(0.0119)	(0.0174)
Non-labour income (family)	-0.000176	-0.000345***	-1.46e-05	7.79e-06
	(0.000170)	(0.000122)	(2.09e-05)	(3.34e-05)
Log hourly predicted wage rate	-0.145	-0.127*	0.0204	0.0694***
	(0.122)	(0.0766)	(0.0148)	(0.0207)
Log hourly predicted wage rate sq	-0.00359	-0.0953***	0.00868	0.0249***
	(0.0407)	(0.0349)	(0.00839)	(0.00944)
N. household members	0.00367	-0.0637**	0.0104*	0.0198**
	(0.0425)	(0.0274)	(0.00536)	(0.00777)
N. younger child 0-4	-0.166	0.232***	0.608***	0.432***
	(0.104)	(0.0688)	(0.0197)	(0.0252)
N. younger child 5-12	-0.142**	0.220***	-0.00952	0.0269*
	(0.0692)	(0.0474)	(0.00994)	(0.0142)
N. younger child 13-17	0.0264	0.0886	-0.0504***	-0.0957***
	(0.0809)	(0.0558)	(0.0101)	(0.0141)
Indigenous	-0.571***	0.131	-0.0189	0.00967
	(0.205)	(0.133)	(0.0286)	(0.0411)
Rural area	-0.873***	0.703***	0.00976	-0.0299
	(0.158)	(0.0994)	(0.0198)	(0.0294)
Sector 2	0.284	-0.0108	0.0383	0.0316
	(0.239)	(0.167)	(0.0309)	(0.0436)
Sector 3	0.739***	-0.192	0.0709**	0.00474
	(0.229)	(0.157)	(0.0298)	(0.0419)
Sector 4	0.0503	-0.0119	0.0577**	0.0430
	(0.223)	(0.154)	(0.0288)	(0.0411)
Region 1	-0.438***	0.0489	0.0117	-0.0480*
	(0.137)	(0.0865)	(0.0185)	(0.0253)
Region 2	-0.0287	0.0935	-0.0408**	-0.00782
	(0.122)	(0.0828)	(0.0173)	(0.0254)
Region 3	0.235*	0.175**	0.0312	0.0224
	(0.125)	(0.0841)	(0.0199)	(0.0263)
Region 4	-0.206	0.160	-0.0424**	0.0219
	(0.142)	(0.0975)	(0.0179)	(0.0264)
Region 5	0.405*	-0.379***	-0.0954***	-0.194***
	(0.223)	(0.137)	(0.0310)	(0.0360)
Constant	1.374*	3.794***	0.536***	0.572***
	(0.729)	(0.499)	(0.129)	(0.166)
R-squared	0.192	0.092	0.364	0.162
Observations	8,273	8,273	8,273	8,273

Note: Bootstrapped standard errors in parentheses. The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Non-labour income is in US dollars. *Rural area is considered for Mexico, Peru and Ecuador, while Colombia is not considered to be a municipality. We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table II.C17. Difference between self-employed and employed mothers in the time devoted paid work, unpaid work, non-educational child care and educational child care (education level)

	(1)	(2)	(3)	(4)
	Paid work	Unpaid work	Non-educational child care	Educational child care
Panel A: Mexico (N=3,063)				
(hours per week)				
Self-employed	-6.971***	7.175***	0.303	0.532***
	(0.951)	(0.841)	(0.246)	(0.177)
Education level 2	-1.737	-1.851	0.0174	0.285
	(1.298)	(1.296)	(0.388)	(0.295)
Education level 3	-4.291**	-3.299	-0.570	-0.174
	(2.000)	(2.296)	(0.736)	(0.456)
Education level 4	-5.288**	-4.679**	1.426**	0.277
	(2.129)	(2.209)	(0.697)	(0.432)
Education level 5	-4.191	-5.529	1.748	0.463
	(3.372)	(4.105)	(1.285)	(0.825)
Education level 2*self-employed	0.380	-1.364	0.778	1.416***
	(2.117)	(1.804)	(0.571)	(0.464)
Education level 3*self-employed	-2.095	-5.665	-0.488	0.214
	(3.882)	(3.932)	(0.860)	(0.936)
Education level 4*self-employed	-0.380	-2.901	0.403	0.681
	(2.246)	(2.373)	(0.876)	(0.612)
Education level 5*self-employed	9.059	-10.30	-2.303**	0.378
	(10.90)	(12.37)	(1.160)	(2.314)
Panel B: Peru (N=1,035)				
(hours per week)				
Self-employed	-8.943***	6.679***	0.888**	0.549
	(1.786)	(1.291)	(0.395)	(0.352)
Education level 2	2.261	-0.768	0.345	1.363**
	(2.740)	(1.858)	(0.595)	(0.576)
Education level 3	0.213	-1.914	1.085	2.108***
	(3.494)	(2.268)	(0.863)	(0.720)
Education level 4	-5.629	-0.537	0.292	2.743***
	(4.164)	(2.884)	(0.979)	(0.926)
Education level 5	-0.875	-13.32***	-0.545	7.005***
	(7.390)	(4.409)	(2.751)	(2.009)
Education level 2*self-employed	0.287	-0.194	-0.365	-0.811
	(2.900)	(2.005)	(0.573)	(0.601)
Education level 3*self-employed	-3.557	3.121	-0.610	-0.593
	(3.917)	(2.473)	(0.943)	(0.789)
Education level 4*self-employed	5.892	-0.701	0.269	0.514
	(4.481)	(3.150)	(0.965)	(0.986)
Education level 5*self-employed	-	-	-	-
Panel D: Ecuador (N=3,065)				
(hours per week)				
Self-employed	-5.959***	7.146***	0.160	0.725***
	(0.796)	(0.923)	(0.207)	(0.252)
Education level 2	0.679	-0.857	-0.489	-0.108
	(1.385)	(1.532)	(0.358)	(0.465)
Education level 3	0.203	-0.912	-0.450	0.147
	(1.977)	(2.225)	(0.549)	(0.710)
Education level 4	2.298	-2.510	-0.341	0.139
	(2.282)	(2.496)	(0.579)	(0.768)
Education level 5	4.352	-3.067	-0.443	0.612
	(3.346)	(5.071)	(1.141)	(1.538)
Education level 2*self-employed	1.626	0.233	0.187	0.712
	(1.475)	(1.535)	(0.354)	(0.515)
Education level 3*self-employed	3.964*	-1.155	0.580	1.684*
	(2.403)	(2.466)	(0.601)	(0.940)
Education level 4*self-employed	6.644***	-3.021	0.241	0.678
	(2.260)	(2.056)	(0.543)	(0.855)
Education level 5*self-employed	3.217	8.839	3.379	6.307***
	(2.831)	(11.08)	(3.711)	(1.399)

Table II.C17. Continued

	(1)	(2)	(3)	(4)
	Paid work	Unpaid work	Non-educational child care	Educational child care
Panel E: Colombia (N=8,273) (hours per day)				
Self-employed	-1.318***	6.618***	0.108***	0.0644***
	(0.149)	(0.661)	(0.0160)	(0.0245)
Education level 2	-0.0607	-0.104	0.0152	-0.00353
	(0.187)	(0.853)	(0.0238)	(0.0348)
Education level 3	-0.632***	-0.162	0.0314	0.00475
	(0.220)	(0.997)	(0.0301)	(0.0421)
Education level 4	-0.884***	-0.446	0.0351	0.0357
	(0.269)	(1.215)	(0.0370)	(0.0507)
Education level 5	-0.937***	-2.661*	0.0508	0.0974
	(0.309)	(1.483)	(0.0430)	(0.0627)
Education level 2*self-employed	-0.129	1.886**	-0.0308	0.0131
	(0.208)	(0.952)	(0.0261)	(0.0385)
Education level 3*self-employed	0.0188	1.527	0.0416	0.0984*
	(0.273)	(1.186)	(0.0410)	(0.0531)
Education level 4*self-employed	0.383	-3.290**	0.0363	0.130*
	(0.319)	(1.455)	(0.0498)	(0.0774)
Education level 5*self-employed	0.913*	-9.140***	0.0626	0.270*
	(0.483)	(2.040)	(0.102)	(0.146)

Note: Bootstrapped standard errors in parentheses. Data sources are time use surveys from Mexico (2009), Peru (2010), Ecuador (2012) and Colombia (2012). The sample is restricted to include self-employed and employed mothers of children under 18, who are not students or retirees. Education level 1 is equivalent to less than high school degree, education level 2 is equivalent to high school degree, education level 3 is equivalent to more than a high school degree, education level 4 is equivalent to a university degree and education level 5 is equivalent to more than a university degree. See Appendix C for a description of all the activities included in paid work, non-market work, and non-educational and educational child care. Time devoted to the activities is measured in hours per week (Mexico, Peru, and Ecuador) and hours per day (Colombia). We include in Colombia dummy variables to control for the day of the week (Ref.: Sunday). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

III. Chapter III: Efficient labor supply for Latin America families: is intra-household bargaining power important?

III.1. Introduction

Among the most important changes in Latin American countries in recent decades is the growing contribution of women to the work force, as millions of women have increased their level of education, leading many to enter the labor market. (CEPAL, 2014; World Bank, 2017). This trend has led more and more women to decide how much they want to work, in order to generate their own income, and contribute to their household income (Montaño, 2010, Mateo Díaz and Rodríguez-Chamussy, 2016). But to date, there are still gender inequalities in the time devoted to work in these countries, especially within households (Newman, 2002; Medeiros et al., 2007; Milosavljevic, 2007; Canelas and Salazar, 2014; Campaña., et al 2018), as men devote comparatively more time to paid work and women comparatively more time to unpaid work – especially care work. To evaluate the efficiency of public policies aimed at reducing inequalities within households, an understanding of how work is shared at home is essential for the design of effective public policies.

One commonly-used approach to analyze time-allocation decisions within households (from both theoretical and empirical evidence) is that of collective models (Chiappori, 1992; Browning et al., 1994; Browning and Chiappori, 1998; Chiappori et al., 2002; Chiappori and Mazzoco, 2018). According to this approach, the intra-family agreement is reached through the so-called sharing rule, after assuming only that intra-family decisions are Pareto-efficient. The sharing rule describes the way in which non-labor income is distributed among the members of the couple. Many studies have pointed to the validity of the collective model (see the surveys, Vermeulen, 2002; Donni and Chiappori, 2011; Chiappori and Mazzocco, 2018, and Donni and Molina, 2018), although the bulk of this evidence is focused on developed countries.

The provision of paid and unpaid work for Latin American countries within the household has been analyzed in prior research (Newman, 2002; Milosavljevic, 2007; Esplen, 2009; Gammage, 2010; Medeiros et al., 2010; Canelas and Salazar, 2014; Calero

et al., 2016; Campaña et al., 2018), but the evidence within the framework of collective models for these countries is very limited, with certain exceptions. For Brazil, Tiefenthaler (1999) estimating multi-sector labor supply equations, rejects the unitary model in the informal and self-employment sectors for males and the formal and informal sectors for females. For Mexico, Reggio (2011) applies a household collective model, to understand what motivates parents to send their children to work. The author finds that an increase in the bargaining power of a mother is associated with fewer hours of work for her daughters, but not for her sons. Also, for Mexico, Attanasio and Lechene (2002) test the hypothesis of income pooling in household decisions, and Attanasio and Lechene (2014) investigate efficient responses to targeted cash transfers, using a collective model as the theoretical framework.

Against this background, we use time use data surveys from Mexico (2009) and Colombia (2012) to estimate the collective model of labor supply proposed in Chiappori et al., (2002) to evaluate, among other factors, whether the intra-household bargaining power is an important variable. In doing so, we use sex-ratio as the distribution factor within households (Chiappori et al., 2002; Rapoport et al., 2011), and the GMM estimator (Generalized method of moments) is used to estimate the model. Our results point towards the validity of the collective model approach, as the test of collective rationality is accepted in both countries. This result indicates that the labor supply of couples in these countries is Pareto-efficient. Furthermore, higher female salaries are related to more labor market hours of female workers, cross-wages are negatively related to the labor supply of male and female workers, and male workers show an altruistic behavior towards females with the increase of their labor income. Sex-ratio are related to transfers of additional income from male to female workers in Colombia. The presence of children is negatively related to the labor supply of female workers in Mexico, while in Colombia the presence of other household members over age 18 is positively related to the female labor supply.

Our contribution to the literature is twofold. First, we provide empirical evidence with the theoretical support of the collective model for the household labor supply, in countries that still only have limited evidence. Thus, we analyze data from two countries with different welfare regimes, in an attempt to extract common patterns in factors that influence the labor supply of male and female workers (living in couples), and the ways in which non-labor income is distributed among the members of the couple. Second, we

focus on analyzing whether the intra-household bargaining power is an important variable, in order to test the gender inequality in our sample of developing countries. As Agarwal (1997) mentions for developing countries, it is important to study the approach to negotiation in households, as this provides a useful framework for analyzing gender relations and sheds light on how gender asymmetries are constructed and questioned. In addition, the distribution of bargaining power within the household is a significant factor that must be considered when analyzing household decisions, which in turn have important repercussions for public policies (Reggio, 2011; Bargain et al., 2014; LaFave and Thomas, 2017).

The rest of the work is organized as follows. Section 2 describes the theoretical framework. Section 3 presents the data. Section 4 explains our econometric strategy and results, and Section 5 contains our conclusions.

III.2. Theoretical framework

III.2.1. *Background*

The study of household behavior began with the unitary approach, based on the assumption that the family is an individual entity, and so preferences of the household can be represented by a single behavioral function (Samuelson, 1956; Becker, 1973). However, this unitary approach is subject to a series of criticisms (see Chiappori and Mazzoco, 2018, for a review). The main assumption, which assumes that subjective preferences are individual, does not fit the usual structure of a household formed by a group of individuals with different preferences, among which an intra-family decision process takes place. Only when the home is single-family, or when the preferences of a member are explicitly taken as family preferences, will it be methodologically correct to use the unitary approach. Furthermore, this approach implies that the individual non-labor income is aggregated into a single family, so that the source of this exogenous income plays no role in the intra-family distribution of consumption of goods or labor supply. In addition, the unitary approach does not allow us to determine the intra-family distribution of consumption and labor supply, and consequently welfare. In other words, the traditional approach does not allow for the characterization of intra-family inequalities.

Given the limitations of the unitary approach, an alternative has developed, where the issues arising from intra-family negotiation are modelled. According to this approach, the presence of individuals in couples with different preferences is instrumented, admitting the existence of two individual functions of utility, one for each spouse. This general approach has given rise to two other approaches: the game theory (Manser and Brown, 1980; McElroy and Horney, 1981) and the collective model (Chiappori, 1988, 1991, 1992). Regarding game theory, the analysis of family behavior is placed in a cooperative context with negotiation, so that members of the household try to reach agreement on how to divide the gains derived from life in common, through Nash or Kalai-Smorodinsky solutions. Regarding the collective model, intra-family agreement is reached through the so-called sharing rule, after assuming only that intra-family decisions are Pareto efficient.

Chiappori (1988, 1991) criticizes the use of the Nash negotiation as a decision process, given that the entire negotiation involves a breaking point or status quo. From the analysis of comparative statics, it can be deduced that the family demand function obtained in a negotiation context does not necessarily verify the restrictions that characterize a demand function generated from individual behavior. Browning and Chiappori (1998) provide arguments as to why the collective approach should focus on Pareto-efficient assignments. In the first place, in a context of repeated play, the assumption of perfect information about the preferences of the other member of the household would be justified and, in such a case, it is expected that the resulting assignment will be Pareto-efficient. Second, the Pareto efficiency assumption is the most natural generalization of the maximization assumption of a welfare function, in a unitary model with households of more than one member.

From the seminar papers published by Chiappori (1988) and Apps and Rees (1988), the approach of household collective models has gradually gained more acceptance, both in theoretical terms and in applied empirical work (Browning et al., 1994; Haddad and Hoddinott, 1994; Browning and Chiappori, 1998; Duflo, 2000; Barmby and Smith, 2001; Chiappori et al., 2002; Quisumbing and Maluccio, 2003; Vermeulen, 2006; Blundell et al., 2007; Chau et al., 2007; Donni, 2007; Kalugina et al., 2009; Rapoport et al., 2011; Lyssiotou 2017; Molina et al., 2018).

III.2.2. *The collective model on labour supply*

Our theoretical framework is based on the collective model of labor supply from Chiappori et al., (2002). The collective model assumes that intra-familial decisions are Pareto efficient. It is considered that the home is formed by two individuals of working age, m = male, f = female, whose rational preferences can be represented by individual utility functions that, in general, are assumed to be altruistic. Thus, each individual's preferences are defined in terms of own vectors of goods and time, as well as the vectors of the other member:

$$u^i = u^i(q^m, q^f, l^m, l^f, \mathbf{z}) \quad (1)$$

where $u^i, i = m, f$ are strictly quasiconcave functions, increasing and twice continuously differentiable. The arguments are the consumption of each of the spouses, $q^i, i = m, f$, and whose prices are normalized to the unit, as well as their leisure times $l^i, i = m, f$, with z being a vector of the variables of preference that include the characteristics of the family. In addition, the household budget constraint is:

$$q^m + q^f + \omega^m l^m + \omega^f l^f \leq y + (\omega^m + \omega^f)T \quad (2)$$

where $\omega^i, i = m, f$ denotes the individual salary, y is the non-labor family income, and T is the amount of time available.

According to the collective approach, demand functions can be derived from an intra-familial decision process whose only requirement is that it must lead to efficient assignments in the Pareto sense. Given the initial assumption that individual utility functions are strictly quasi-concave, and that the budget constraint defines a convex set, the utility possibilities will be strictly convex. Consequently, all efficient Pareto assignments can be characterized as points of a linear social welfare function, with positive weights for both household members in joint well-being. Therefore, the above problem can be expressed in the following terms:

$$Max_{q^m, q^f, l^m, l^f} \mu(\omega^m, \omega^f, y, \mathbf{s}, \mathbf{z}) u^m(q^m, q^f, l^m, l^f, \mathbf{z})$$

$$+[1 - \mu(\omega^m, \omega^f, y, s, \mathbf{z})]u^f(q^m, q^f, l^m, l^f, \mathbf{z})$$

subject to:

$$q^m + q^f + \omega^m l^m + \omega^f l^f \leq y + (\omega^m + \omega^f)T \quad (3)$$

where "s" is a vector of distribution factors and $0 \leq \mu \leq 1$. In this optimization problem, the weights $\mu(\omega^m, \omega^f, y, \boldsymbol{s}, \boldsymbol{z})$ and $[1 - \mu(\omega^m, \omega^f, y, \boldsymbol{s}, \boldsymbol{z})]$ are the Lagrangian multipliers (normalized), interpreted as indicators of the bargaining power of household members in the process of intra-familial distribution. It is assumed that they are continuously differentiable and homogenous of zero degree in *y* and *w.* As can be seen from these expressions, the collective framework implies that the bargaining power (μ) depends on the individual salary (ω^m, ω^f) on the non-labor income of the household (**y**), on the set of family characteristics, (z), and on the distribution factors (s). The distribution factors denote variables that influence family behavior through their effect on the intra-familial decision process (that is, on the negotiation power function μ), but which do not affect either the preferences of the individual or the budgetary restriction of the household (Browning et al, 1994; Browning and Chiappori, 1998).[34]

Assuming an inner solution, and whenever individual preferences are assumed to be weakly separable in (q^i, l^i), Pareto-efficient decisions are expressed in terms of the following leisure demand functions of the two spouses:

$$l^m(\omega^m, \omega^f, y, \boldsymbol{s}, \boldsymbol{z}) = L^m[\omega^m, \omega^f, y, \boldsymbol{z}, \mu(\omega^m, \omega^f, y, \boldsymbol{s}, \boldsymbol{z})] \quad (4)$$

$$l^f(\omega^m, \omega^f, y, \boldsymbol{s}, \boldsymbol{z}) = L^f[\omega^m, \omega^f, y, \boldsymbol{z}, \mu(\omega^m, \omega^f, y, \boldsymbol{s}, \boldsymbol{z})] \quad (5)$$

Chiappori et al., (2002) focus on the labor supply of spouses, where *hⁱ (i=m,f,)* represents the labor offer of each of the spouses, so that $0 \leq h^i \leq 1$. Thus, the labor supply can be

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[34]The distribution factors affect consumption and leisure only through the chosen point of the Pareto border, in such a way that they modify the weight given to the utility function of each individual, but they do not modify said border. Several distribution factors have been used in the literature, with the differences in income between the spouses being the most common (Browning et al., 1994). Chiappori et al. (2002) use the proportion of the sex-ratio (proportion of men compared to women) and legislation on divorce. Crespo (2009) used, among others, differences in the level of education between spouses. Blau and Goodstein, (2016) use inheritance, and Lyssiotou, (2017) uses child benefits.

considered as the difference between the total time (1) and leisure (h^i=1-l^i), and the model can be presented in terms of labor supply. In this sense, the utility functions of household members can be represented as $u^i = u^i(q^m, q^f, 1 - l^m, 1 - l^f, \mathbf{z})$, with i=m,f. Based on this approach, the optimization problem arises in terms of the labor supply of household members, giving rise to well-defined Mashallian demands on labor supply:

$$(h^i(\omega^m, \omega^f, y, \mathbf{s}, \mathbf{z}) = L^i[, \omega^f, y, \mathbf{z}, \mu(\omega^m, \omega^f, y, \mathbf{s}, \mathbf{z})]).$$

In this theoretical framework, a parameter of interest is known as the sharing rule. Given the theoretical properties indicated above, the decision process within the family can be characterized, on the basis of the second theorem of welfare economics, in terms of a two-stage decision process. In the first place, the non-labor income is distributed among the members of the couple and, subsequently, each member of the couple chooses their labor supply (and their consumption of the good), subject to the respective budget constraint. The function Φ is known as the "sharing rule" and describes the way in which the non-labor income is distributed among the members of the couple, which depends on wages, total non-labor income, distribution factors, and other observed characteristics.

Thus, if the labor supply functions are differentiable, and assuming there are no corner solutions, these functions can be expressed as:

$$h^f = H^f[\omega^f, \Phi(\omega^m, \omega^f, y, \mathbf{s}, \mathbf{z}), \mathbf{z}] \tag{6}$$

$$h^m = H^m[\omega^m, y - \Phi(\omega^m, \omega^f, y, \mathbf{s}, \mathbf{z}), \mathbf{z}] \tag{7}$$

where H^i is the labor supply function of the individual $i = m, f$. In this framework, only one distribution factor is needed for stability and integration requirements (Chiappori et al., 2002). From these labor supply functions, a series of conditions that function as Slustky restrictions are derived, in the sense that they constitute a set of partial derivatives and inequalities that must be fulfilled by labor supply functions. It is important to note that these conditions do not depend on any assumption made about the functional form of the preferences. In addition, the partial derivatives of the sharing rule can be obtained as a function of the first partial derivatives of job offers.

III.2.3. *Parametric specification of the Collective Model*

To estimate the collective model of labor supply, we first specify the form of the labor supply function, using a static model known as "semi-logarithmic model" according to which the following system is estimated:

$$h^f = f^0 + f^1 log\omega^f + f^2 log\omega^m + f^3 y + f^4 log\omega^f log\omega^m + f^5 \mathbf{s} + f^6 \mathbf{z} \qquad (8)$$

$$h^m = m^0 + m^1 log\omega^f + m^2 log\omega^m + m^3 y + m^4 log\omega^f log\omega^m + m^5 \mathbf{s} + + m^6 \mathbf{z} \quad (9)$$

This functional form of labor supply satisfies a set of desirable properties, among which we highlight that it is possible to recover (partially) the sharing rule. From this system, the sufficient and necessary conditions to test compliance with the collective model are expressed as follows:

$$\frac{m^4}{f^4} = \frac{m^5}{f^5} \qquad (10)$$

in such a way as to express the conditions of Slutsky that must be fulfilled in the collective model. This is known as the test of collective rationality.

The partial derivatives of the sharing rule are given by the following equalities:

$$\Phi_y = \frac{f^3 m^4}{\Delta} \qquad (11)$$

$$\Phi_s = \frac{m^4}{\Delta} f^5 \qquad (12)$$

$$\Phi_{\omega^f} = \frac{f^4}{\Delta} \frac{m^1 + m^4 log\omega^m}{\omega^f} \qquad (13)$$

$$\Phi_{\omega^m} = \frac{m^4}{\Delta} \frac{f^2 + f^4 log\omega^f}{\omega^m} \qquad (14)$$

where $\Delta = f^3 m^4 - f^4 m^3$

We obtain the sharing rule equation, solving these differential equations

$$\Phi = \frac{1}{\Delta}(m^1 f^4 log\omega^f + f^2 m^4 log\omega^m + f^4 m^4 log\omega^f log\omega^m + f^3 m^4 y + m^4 f^5 s) + k(z) \tag{15}$$

where the function $k(z)$ is not identifiable, since the variable z affects both the sharing rule and the preferences.

III.3. Data

The data used to estimate this collective model comes from time use surveys of Mexico (2009) and Colombia (2012).[35] These are the first independent surveys on the use of time in these countries. Previously, information on how individuals allocate their time was only available through modules in other types of surveys, such as integrated household surveys.[36] Time use surveys have become the typical instrument used to analyze the time-allocation decisions of individuals (Gershuny, 2000; Aguiar and Hurst, 2007; Ramey and Ramey, 2010; Gimenez-Nadal and Sevilla, 2012). The two surveys are representative at the national level and the target population are all members of households, age 12 and above, for Mexico, and age 10 and above for Colombia; for Mexico the reference period is the previous week, while for Colombia it is the previous day.[37]

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[35] The reason why we do not consider Peru and Ecuador (countries analyzed in the two previous chapters of the thesis) in this analysis is that their time-use surveys do not provide information about certain characteristics of households (for example: having a washing machine, having a car, etc.) that we use in our econometric estimates (following prior works such as Lyssiotou, 2017). In addition, the time use survey from Peru does not have information regarding the non-labor income of household members.

[36] The methodologies for the time use surveys used in this chapter have been defined by the relevant institutes of statistics in each country: INEGI (National Institute of statistics and geography) in Mexico and DANE (National Administrative Department of statistics) in Colombia.

[37] Following Campaña et al. (2017), the information shown in this thesis chapter for Mexico is presented in hours per week and the information shown for Colombia is in hours per day. The Colombian time-use survey questionnaire is based on a list of daily activities, while Mexico's time-use surveys is based on a list of weekly activities. Individuals organize their time differently and the information differs if it is obtained from an ordinary day or a weekend (Connelly and Kimmel, 2009), so it would not be correct to multiply by seven the information obtained from Colombia.

Our sample consists of heterosexual couples (married or living together) when both partners have answered all sections of the survey, who are not students or retirees, and are between 21 and 65 years old (inclusive). Furthermore, both partners have positive hours of work. After these restrictions are fulfilled, our sample is 2,418 couples in Mexico, and 4,921 couples in Colombia. The dependent variables, female and male hours of work, are defined for Mexico as total hours of work per week in all jobs, while for Colombia it is total hours of work per day on all jobs. The measure of salary is the hourly wage. Non-labor income in both cases includes income from transfers (income from other households, and subsidies from the government or from private institutions) or other income (income from renting houses, apartments, vehicles, machinery and equipment), and for Mexico it also includes income from bank interest and income from stocks or dividends. Hourly wages (female and male) and non-labor income for both countries are expressed in US Dollars.[38]

Regarding our distribution factor, which is the sex-ratio (the number of men per 100 women), for the case of Mexico the information is obtained from the census of the population and housing of Mexico, 2010, while for Colombia, the information is obtained from the 1985-2005 Census Conciliation and Population Projections 2005-2020.[39] Our sex-ratio is computed considering 32 federal entities for Mexico and 6 regions for Colombia.[40]

Table III.1 shows summary statistics for our sample. Regarding the hours of labor supply, in both countries males spend more time in market work than females. In Mexico, males dedicate 50.17 hours a week to work while females spend 37.17 hours a week. In Colombia, males dedicate 8.89 hours a day to work while females spend 7.56 hours a day. The hourly wage of males is higher than the hourly wage of females, in both countries (with this difference being 0.37 dollars in Mexico and 0.35 dollars in Colombia).

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[38]The exchange rate used according to the years of their time use surveys for Mexico is 1 US dollar, equivalent to 13.18 Mexican pesos and for Colombia it is 1 US dollar, equivalent to 1824.19 Colombian pesos.

[39]This information is provided by the INEGI (National Institute of Statistics and Geography) of Mexico and the DANE (National Administrative Department of Statistics) of Colombia.

[40] For our estimates, we group them into four large regions for each country, as follows: Center region, West-center region, North region, and the South-southeast region for Mexico; and San Andres and Atlantic region, Bogota and Central region, the Eastern region, and the Pacific region for Colombia.

Table III.1. Descriptive statistics of the data

Variable	Mexico		Colombia	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Hours of work *				
Female	37.17	17.47	7.56	2.49
Male	50.18	15.16	8.89	2.20
Income**				
Female hourly wage (in $US)	1.91	1.81	2.19	2.35
Male hourly wage (in $US)	2.28	2.42	2.54	2.56
Monthly non-labor income (in $US)	23.46	112.13	31.71	153.72
Distributional factor				
Sex-ratio (Masculinity index)	96.26	3.42	97.59	2.78
Household characteristics				
N. children 0-4	0.28	0.55	0.24	0.49
N. children 5-12	0.71	0.86	0.57	0.76
N. children 13-17	0.48	0.70	0.39	0.64
N. other household members	0.61	0.96	0.59	0.89
Wash machine (dummy)	0.81	0.39	0.71	0.45
Car (dummy)	0.62	0.49	0.20	0.40
House (dummy)	-	-	0.54	0.50
Home natural gas (dummy)	-	-	0.69	0.46
Years of education				
Female	9.92	4.59	11.10	4.51
Male	9.99	4.65	10.47	4.63
Age				
Female	39.08	8.98	39.21	9.74
Male	41.86	9.59	42.46	10.10
Ethnic characeristics				
Female indigenous	0.06	0.23	0.05	0.21
Male indigenous	0.06	0.25	0.05	0.21
Regional and área dummies				
Urban area***	0.85	0.36	0.88	0.33
Region 1	0.29	0.45	0.25	0.43
Region 2	0.28	0.45	0.44	0.50
Region 3	0.23	0.42	0.17	0.37
Region 4	0.20	0.40	0.14	0.35
Occupational category (included in instruments)				
Female employed	0.63	0.48	-	-
Male employed	0.64	0.48	-	-
Female employed (public sector)	-	-	0.08	0.27
Male employed (public sector)	-	-	0.06	0.24
Female employed (private sector)	-	-	0.44	0.50
Male employed (private sector)	-	-	0.46	0.50

Table III.1. Continued

Variable	Mexico		Colombia	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Female peon or farmer	0.02	0.15	0.01	0.09
Male peon or farmer	0.08	0.27	0.03	0.16
Female self-employed	0.32	0.47	0.38	0.49
Male self-employed	0.24	0.43	0.39	0.49
Female employer or business owner	0.02	0.14	0.03	0.17
Male employer or business owner	0.04	0.19	0.06	0.23
Female domestic employed	-	-	0.07	0.25
Male domestic employed	-	-	0.003	0.05
Number of observations	2,418		4,921	

Notes: The sample is restricted to heterosexual couples aged 21–65 (inclusive) who are not students or retired. *Weekly hours of work are considered for México, while daily hours of work are considered for Colombia. **For Mexico 1 US dollar is equivalent to 13.18 Mexican pesos and for Colombia 1 US dollar is equivalent to 1824.19 Colombian pesos. ***Urban area is considered in Mexico while municipality is considered for Colombia. For Mexico, region 1 represents the Centre region, region 2 represents the West-centre region, region 3 represents the North region and region 4 represents the South-southeast region. For Colombia, region 1 represents the Atlantic region and San Andres, region 2 represents the Central region and Bogota, region 3 represents the Eastern region and region 4 represents the Pacific region.

Regarding non-labor income, for Mexico it is 23.46 dollars per month and for Colombia it is 31.71 dollars per month. Concerning the sex-ratio, in Mexico there are 96.26 men and in Colombia there are 97.59 men for every 100 women. Regarding the years of education, in Mexico, males and females have, on average, the same years of education (9.9 years), while in Colombia females on average have 0.63 more years of education than males (males have 10.47 years and females have 11.10 years of education). Ethnic characteristics are the same for males and females in both countries (6% indigenous in Mexico and 5% indigenous in Colombia). Table III.1 also gives summary statistics of the number of children in different age groups, number of other household members (from 18 years and up) and other characteristics (individual, demographic, and household characteristics) used in our estimations.[41]

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[41] We follow the works of Chiappori et al (2002), Kalugina et al (2009), Rapoport et al (2011) and Lyssiotou (2017) for the choice of the variables included in our econometric estimations.

III.4. Econometric strategy and results

Our econometric strategy is based on Chiappori et al., (2002). These authors propose, for the estimation of equations 8 and 9, the use of an estimator based on the Generalized Method of Moments (GMM). An advantage of this method is that it also takes into account heteroscedasticity of unknown form in the errors, in contrast to other alternative estimators available such as maximum likelihood estimator with complete information (FIML) that does not take into account the unknown heteroscedasticity. In addition to allowing to take into account the correlation between the error terms of the labor supply equations of men and women. In this way, the GMM method allows both equations to be estimated at the same time.[42] Following Chiappori et al., (2002), Rapoport et al., (2011), and Lyssiotou, (2017), we instrument wages and non-labor income using a second-order polynomial in age and years of education, occupational categories, ethnic characteristics, regions and areas (urban area dummy).[43]

Tables III.2 and III.3 show the results of estimating the system of Equations (8) and (9) for Mexico and Colombia, respectively. The results for the unrestricted model (i.e., we do not impose the fulfillment of the collective rationality hypothesis) are shown in columns 1 and 2 of the respective tables. We find that the logarithm of male hourly wage is positively related to male labor supply in both Mexico and Colombia, as the regression coefficients are positive and statistically significant at standard levels of significance, but there is no statistically significant association with the labor supply of female workers. The same applies to females, as the logarithm of female hourly wage is positively related to the female labor supply in both Mexico and Colombia, but it has no statistically significant association with the labor supply of male workers. Regarding the logarithm of the cross-wages, we find that for Mexico it is negatively related to the labor supply of female workers, while for Colombia it is negatively related to the labor supply of both male and female workers. Non-labor household income is positively related to the labor supply of male workers in Mexico, while Colombia has no significant association with female and male labor participation.

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[42] Regarding empirical evidence of household collective models, the works of Luo (2002); Mazzocco (2003 a, b); Mazzocco (2004); Vermeulen (2005); Donni (2006); Mazzocco (2007); Crespo (2009); Browning et al. (2013); Lise and Yamada (2014); Thibout (2015) and Molina et al. (2018) use the GMM models to make their respective estimates.

[43] Urban area for Colombia it is considered to be a municipality.

Table III. 2. GMM Parameter Estimates and Sharing Rule Estimates for Mexico (2009)

VARIABLES	Unrestricted Model		General Collective Model		Sharing rule	
	(1)	(2)	(3)	(4)	(5)	(6)
	Female	Male	Female	Male	Coeficients	Derivatives
Log-wage rate (female)	19.81***	-3.678	19.97***	-3.986	133.1***	129.7***
	(4.474)	(2.942)	(4.482)	(2.681)	(9.05e-07)	(9.188)
Log-wage rate (male)	-4.850	10.73**	-4.853	10.80**	95.21***	42.20***
	(3.717)	(5.297)	(3.756)	(5.164)	(8.58e-07)	(9.852)
Cross log-wages	-9.754**	-6.798	-9.956**	-5.849*	195.3***	-
	(4.461)	(4.561)	(4.452)	(3.368)	(8.17e-07)	-
Non-labor income	0.0538	0.0657*	0.0553	0.0625**	-1.086***	-1.138***
	(0.0362)	(0.0337)	(0.0363)	(0.0314)	(3.85e-09)	(0.0529)
Sex-ratio (Masculinity index)	0.472	-1.461	0.0396	0.0233	-0.777***	0.274
	(3.839)	(5.170)	(3.643)	(2.141)	(8.20e-08)	(4.045)
N. children 0-4	-2.286*	0.117	-2.337*	0.332	-	-
	(1.223)	(1.114)	(1.221)	(0.876)	-	-
N. children 5-12	-1.773*	0.840	-1.811*	0.945	-	-
	(0.938)	(0.761)	(0.943)	(0.646)	-	-
N. children 13-17	0.545	0.439	0.561	0.366	-	-
	(1.086)	(0.849)	(1.097)	(0.780)	-	-
N. other household members	-0.808	0.274	-0.843	0.330	-	-
	(0.804)	(0.578)	(0.804)	(0.536)	-	-
Years of education	-1.104***	-0.892**	-1.126***	-0.930***	-	-
	(0.419)	(0.347)	(0.418)	(0.321)	-	-
Age	-0.177	-0.331***	-0.187	-0.312***	-	-
	(0.140)	(0.0953)	(0.139)	(0.0734)	-	-
Indigenous	6.882	4.364	7.057*	3.361	-	-
	(4.247)	(4.114)	(4.235)	(2.566)	-	-
Region 1	1.822	-4.515	0.249	1.037	-	-
	(14.69)	(19.49)	(14.01)	(8.247)	-	-
Region 2	-3.213	-7.140	-3.806	-5.159	-	-
	(5.946)	(7.225)	(5.718)	(3.482)	-	-
Region 3	-6.158	-1.056	-4.866	-5.734	-	-
	(11.90)	(16.53)	(11.34)	(7.301)	-	-
Urban area	1.543	1.322	1.602	0.816	-	-
	(2.408)	(2.501)	(2.415)	(1.844)	-	-
Wash machine	-7.630	4.127	-7.958	6.211	-	-
	(13.87)	(12.10)	(13.97)	(9.784)	-	-
Car	16.48	9.806	17.11	8.053	-	-
	(10.77)	(9.533)	(10.73)	(7.441)	-	-
Constant	8.483	202.9	50.93	58.02	-	-
	(376.4)	(504.8)	(357.1)	(209.0)	-	-
Observations	2,418	2,418	2,418	2,418	2,418	2,418

Notes: Robust standard error in parentheses. Hours of work are measured as weekly hours of work. Instruments: N. children 0-4, N. children 5-12, N. children 13-17, N. other household members, second order polynomial on age and years of education (f-m), years of education (f-m), age (f-m), female employed, male employed, female peon or farmer, male peon or farmer, female self-employed, male self-employed, indigenous female, indigenous male, urban area, region 1, region 2, region 3. The derivatives are computed to respect wage rates (f-m), not with respect to log-wage rates (f-m). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively

Table III.3. GMM Parameter Estimates and Sharing Rule Estimates for Colombia (2012)

	Unrestricted Model		General Collective Model		Sharing rule	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Female	Male	Female	Male	Coeficients	Derivatives
Log-wage rate (female)	1.335**	-0.0127	1.519***	-0.0330	35.80***	-20.99
	(0.586)	(0.239)	(0.469)	(0.233)	(2.42e-06)	(27.36)
Log-wage rate (male)	-0.834	0.668*	-0.822	0.541	640.2***	259.5***
	(0.630)	(0.374)	(0.517)	(0.355)	(1.84e-06)	(21.76)
Cross log-wages	-0.436*	-0.245*	-0.355**	-0.254*	276.3***	-
	(0.226)	(0.143)	(0.175)	(0.138)	(1.20e-06)	-
Non-labor income	-0.0103	0.000562	-0.00266	-0.000987	2.072***	2.017***
	(0.0127)	(0.00639)	(0.00901)	(0.00603)	(2.53e-08)	(0.192)
Sex-ratio (Masculinity index)	1.437	-0.313	-0.0923	-0.0663	71.95***	44.43***
	(1.397)	(0.465)	(0.558)	(0.401)	(1.10e-06)	(11.65)
N. children 0-4	-0.220	0.0394	-0.305	0.0534	-	-
	(0.262)	(0.127)	(0.198)	(0.124)	-	-
N. children 5-12	0.407*	-0.0886	0.256	-0.0779	-	-
	(0.237)	(0.111)	(0.171)	(0.107)	-	-
N. children 13-17	0.443*	-0.0822	0.227	-0.0477	-	-
	(0.266)	(0.129)	(0.172)	(0.124)	-	-
N. other household members	0.567*	-0.178	0.489**	-0.172	-	-
	(0.303)	(0.181)	(0.246)	(0.175)	-	-
Years of education	-0.0488	-0.0930***	-0.0480	-0.0874***	-	-
	(0.0672)	(0.0307)	(0.0543)	(0.0296)	-	-
Age	0.0430	-0.0179*	0.0144	-0.0176*	-	-
	(0.0344)	(0.00981)	(0.0216)	(0.00930)	-	-
Indigenous	-1.378*	-0.0753	-0.912	-0.115	-	-
	(0.785)	(0.411)	(0.570)	(0.396)	-	-
Region 1	-1.483	-1.145**	-0.572	-1.258***	-	-
	(1.030)	(0.445)	(0.584)	(0.409)	-	-
Region 2	4.189	-1.754	-0.871	-0.850	-	-
	(4.670)	(1.666)	(1.946)	(1.448)	-	-
Region 3	0.105	-0.641	0.404	-0.671	-	-
	(0.923)	(0.548)	(0.727)	(0.528)	-	-
Urban area	1.996	-1.261	2.775	-1.220	-	-
	(2.422)	(1.305)	(1.913)	(1.256)	-	-
Wash machine	-0.589	2.500*	1.171	2.263*	-	-
	(2.793)	(1.401)	(2.049)	(1.323)	-	-
Car	3.240	-0.321	0.979	0.122	-	-
	(2.951)	(1.610)	(1.877)	(1.525)	-	-
House	-8.409**	0.928	-5.140**	0.730	-	-
	(3.811)	(1.369)	(2.255)	(1.316)	-	-
Home natural gas	-2.307	1.492	-5.061	1.921	-	-
	(4.766)	(2.574)	(3.495)	(2.429)	-	-
Constant	-130.9	40.34	19.86	15.83	-	-
	(137.7)	(46.16)	(55.14)	(39.71)	-	-
Observations	4,921	4,921	4,921	4,921	4,921	4,921

Notes: Robust standard error in parentheses. Hours Of work are measured as daily hours of work are considered Instruments: N. children 0-4, N. children 5-12, N. children 13-17, N. other household members, second order polynomial on age and years of education (f-m), years of education (f-m), age (f-m), female employed(public sector), male employed (public sector)Female employed (private sector), male employed (private sector), female peon or farmer, male peon or farmer, female self-employed, male self-employed, female employer or business owner, male employer or business owner, indigenous female, indigenous male, urban area, region 1, region 2, region 3. Urban area for Colombia it is considered to be a municipality. The derivatives are computed to respect wage rates (f-m), not with respect to log-wage rates (f-m) ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

The results for non-labour household income may be surprising a priori, but an analysis of this variable indicates that more than 80% of Colombian households analyzed do not have non-labor household income, which may explain why this variable does not affect the labour supply of couples. The sex-ratio has no influence on the labor supply of male and female workers in either country.

The presence of children is not statistically associated with the labor supply of males, but it is related to the labor supply of females in both Mexico and Colombia. In Mexico, the number of children between 0-4 and 5-12 years has a negative and statistically significant relation to the labor supply of female workers, while in Colombia the number of children between 5-12 and 13-17 has a positive and statistically significant relation on the labor supply of female workers. In addition, the fact that there are more members in the household (e.g., grandparents, uncles…) is positively related to the labor supply of females in Colombia.

The GMM estimations of the unrestricted model yield values for the Hansen test (χ^2) that allows us to accept the validity of the instruments for both Mexico (p=.99) and Colombia (p=.23). Regarding the collective rationality test, to see if the application of the collective model is consistent with the data, when applying the test of equation (10), we observe that this equality is fulfilled. The evidence shows that collective rationality cannot be rejected at the 10% level for both Mexico (χ^2=0.02) and Colombia (χ^2=2.02). All this evidence leads us to conclude that families in Latin American countries take decisions that are Pareto efficient, and the collective model is valid to model their decisions regarding labour supply.

Columns 3 and 4 of Tables III.2 and III.3 show the results of the estimates associated with the restricted collective model of labor supply for Mexico and Colombia, where the fulfillment of the collective rationality condition (e.g., equation 10, $\frac{m^4}{f^4} = \frac{m^5}{f^5}$) is imposed. The coefficients of the restricted model, compared with the unrestricted model, are similar, but we observe certain notable changes in the coefficients. For the case of Mexico, the logarithm of cross-wages becomes significant at standard levels in the case of male workers, and in Colombia the logarithm of male hourly wage becomes non-significant for the labor supply of males. Furthermore, in Colombia the number of children (age ranges between 5-12 and 13-17 years) is no longer significant for the labor supply of female workers. Again, the Hansen test (χ^2) does not reject the validity of the

instruments for both Mexico and Colombia; for México (Table III.2) with associated p-values of 0.99, and for Colombia (Table III.3) with associated p-values of 0.08.

Column 5 of Tables III.2 and III.3 shows the implicit parameters of the female sharing rule, derived from the restricted parameters of the general collective model using equation (15), for Mexico and Colombia. Furthermore, Column 6 reports the partial derivatives of the sharing rule along with their standard errors. The partial derivatives represent the impact of marginal changes in one variable on the accumulated non-labor income of female workers after sharing. For Mexico (Table II.2, column 6), an increase of $1.00 in the female wage rate ω^f, which would be equivalent to an approximate monthly increase of $160 a month, considering the average of hours worked, translates into the transfer of $130 of non-labor income to the female. This result shows an egoistic behavior on the part of females towards the males. On the other hand, an increase of $1.00 in the male's wage rate, ω^m, which would be equivalent to an approximate monthly increase of $215 a month, considering the average of hours worked, translates into the transfer of $42 of non-labor income to female workers. This result shows an altruistic behavior on the part of males towards the females. Regarding household non-labor income, an increase of $1.00 in this income is related to a decrease of $1.14 in the female´s non-labor income, indicating that non-labor income benefits males more than females. The reported values are statistically significant at standard levels. With respect to the impact of the distribution factor on the intra-household allocation of non-labor income, in the case of Mexico, the sex-ratio is not significant.

For Colombia (Table III.3, column 6), the coefficient for the female wage rate ω^f is not statistically significant, while an increase of $1.00 in the male wage rate, ω^m, which would be equivalent to an approximate monthly increase of $268 a month considering the average of hours worked, translates into the transfer of $260 of non-labor income to female workers. This result shows an altruistic behavior on the part of males towards females. Regarding household non-labor income, an increase of $1.00 in this income will increase the female non-labor income by $2.02. Finally, regarding the impact of the distribution factor, a one percentage point increase in the sex-ratio will induce males to transfer an additional $44.43 of income to females. The reported values are statistically significant at the standard levels of significance.

Finally, Tables III.4 and III.5 show several elasticities of labor supply for Mexico and Colombia, respectively. For the computation of elasticities, we first estimate the unrestricted model to obtain the estimates of the parameters of the model, and we then evaluate each elasticity using the values of the parameter estimates and the mean values of the variables. Similarly, to obtain the elasticities from the restricted model, the same steps are followed, although we impose the restrictions when we estimate the parameters of the model. For both Mexico and Colombia, the female wage rate is negatively related to the female labor supply, and positively related to the male labor supply, with these relations being statistically significant at standard levels in both the unrestricted and the general (e.g., restricted) collective models. The male wage rate for Mexico is positively related to the female labor supply and negatively related to the male labor supply, in both the unrestricted and the general collective models, while for Colombia, the male wage rate is negatively related to both male and female labor supply, and in both the unrestricted and the general collective models. Finally, regarding non-labor income, no statistically significant results are shown in the case of Mexico, and for Colombia non-labor income it is positively related to male labor supply in both the unrestricted and the general collective models.

Table III.4.
Elasticities (Mexico 2009)

VARIABLES	Unrestricted Model		General Collective Model	
	(1)	(2)	(3)	(4)
	Female	Male	Female	Male
Wage rate (f)	-1.647***	1.502***	-1.650***	1.570***
	(0.185)	(0.174)	(0.185)	(0.174)
Wage rate (m)	0.753***	-1.344***	0.751***	-1.313***
	(0.169)	(0.133)	(0.169)	(0.130)
Non-labor income	0.00248	-7.92e-05	0.00248	-5.99e-05
	(0.00283)	(0.00263)	(0.00283)	(0.00264)

Robust standard errors in parentheses. The elasticities are computed with respect to wage rates (f-m), not with respect to log-wage rates (f-m) ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively

Table III.5.
Elasticities (Colombia 2012)

VARIABLES	Unrestricted Model		General Collective Model	
	(1)	(2)	(3)	(4)
	Female	Male	Female	Male
Wage rate (f)	-0.119***	0.0734***	-0.0784***	0.0604***
	(0.0246)	(0.0179)	(0.0237)	(0.0177)
Wage rate (m)	-0.0794***	-0.0978***	-0.0295	-0.113***
	(0.0199)	(0.0160)	(0.0191)	(0.0159)
Non-labor income	-0.000221	0.000443**	-0.000158	0.000423*
	(0.000320)	(0.000223)	(0.000310)	(0.000221)

Robust standard errors in parentheses. The elasticities are computed with respect to wage rates (f-m), not with respect to log-wage rates (f-m). ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively

III.5 Conclusions

In this chapter, we analyze the provision of market work in couples of Latin American countries, within the framework of the collective model of labor supply proposed by Chiappori et al., (2002). Using time use data from Mexico (2009) and Colombia (2012) and the GMM estimator, we show that the collective rationality is not rejected in the two countries studied, supporting the existence of Pareto efficiency in the decisions couples make. Furthermore, we show that the salary of females is positively related to their labor supply. For Mexico, the salary of male and household non-labor income is positively related to male labor supply, and the presence of children is negatively related to the labor supply of female workers. Males from both countries show an altruistic behavior towards females with the increase of their labor income, and non-labor income benefits females in Colombia. The sex-ratio, analyzed as a distribution factor, benefits females in Colombia, since an increase in this ratio is related to transfers from males to females. The empirical evidence provided in this work highlights the validity of the collective model for Mexico and Colombia, showing the existence of decision processes in the household that are Pareto efficient.

Regarding direct recommendations in terms of public policies, we first observe that, in Mexico, the presence of children is negatively related to female labor supply, indicating that policy makers should make the necessary efforts to grant households with young

children access to formal child care services. Authors such as Hallman et al., (2005), Contreras et al., (2012), and Mateo Díaz and Rodriguez-Chamussy, (2016) for Latin America countries show the benefits of formal child care services and their positive effect on mothers' working hours. Furthermore, in both countries, male workers show an altruistic behavior, while females do not, which may indicate that income and/or subsidy programs will have different impacts on household inequality, depending on the recipient of the transfer. According to our results, transfers to males would be more helpful in reducing inequalities within the household, as a transfer from males to females occurs in such households. Policy-makers should consider our results when designing efficient policies aimed at reducing household inequalities.

One limitation of our analysis is that our data is a cross-section of individuals and does not allow us to identify differences in the time devoted to work, net of (permanent) individual heterogeneity in preferences and characteristics. At present, there are no panels of time-use surveys currently available, and we leave this issue for future research. Second, the analysis is limited to the labor supply of individuals, despite that the time individuals devote to unpaid activities, such as adult/child care, or housework, is an important source of inequality within households (Campaña el al., 2018). The logical way to extend our analysis would be to include unpaid work time, in which Rapoport et al. (2011) could be used as a theoretical framework. With the data at hand, information on unpaid work time can be obtained from the same couples as analyzed in this chapter, and we leave this issue also for future research.

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Conclusiones en español

Se puede argumentar que un recurso escaso fundamental en la economía es el tiempo y descubrir cómo los individuos asignan su tiempo es crucial para aumentar nuestra comprensión de la dinámica del cambio económico y el bienestar. En este sentido y con respecto a países latinoamericanos, uno de los avances más importantes durante las últimas décadas ha sido el aumento de mujeres en el mercado laboral, reflejado en un aumento en la tasa de participación de la mujer en la fuerza laboral, que pasó del 40.5% en 1990 al 54.1% en 2014 (Banco Mundial, 2017). Sin embargo, las mujeres siguen dedicando más tiempo a la producción doméstica en comparación con los hombres (Gershuny, 2000, Fisher y Robinson, 2011; Canelas y Salazar, 2014), produciendo como efecto que en muchos países las mujeres dedican más tiempo al trabajo total en comparación con los hombres (Giménez-Nadal y Sevilla 2012; Burda et al., 2013).

Considerando esta evidencia, y desde una aproximación unitaria en el Capítulo I de esta Tesis Doctoral, analizamos el papel que desempeñan las normas sociales en el tiempo dedicado al trabajo total (suma del trabajo remunerado y no remunerado) por parte de hombres y mujeres en tres países latinoamericanos. Utilizando las encuestas de uso del tiempo de México, Perú y Ecuador, nuestros resultados indican que Ecuador tiene diferencias de género comparativamente mayores en la distribución del trabajo total en comparación de México y Perú. Para explicar estas diferencias y examinar la influencia de las normas sociales en cada país, construimos un índice de normas sociales de género a partir de los datos contenidos en la última ola (2010-2014) de la encuesta mundial de valores (WVS). Nuestros resultados econométricos muestran que cuando incluimos este índice, la brecha de género en el trabajo total se reduce, tanto en un análisis general, como cuando comparamos a hombres y mujeres que se encuentran en el mercado de trabajo y, a su vez, cuando los clasificamos en auto-empleados/as o asalariados/as. Por lo tanto, las normas sociales se revelan como un factor importante para explicar la diferencia de género en el trabajo total.

También encontramos que las condiciones macroeconómicas, como la tasa de crecimiento del PIB, están relacionadas con la desigualdad de género en el trabajo total. Encontramos que un mayor crecimiento del PIB se asocia con una mayor desigualdad en el tiempo dedicado al trabajo total. Este resultado es consistente con Kabeer (2016), quien

descubre que el exceso de trabajo de las mujeres permite el crecimiento económico en estos países. El resultado plantea preguntas sobre el papel que los factores económicos, como la productividad, la mejora de las infraestructuras o las políticas de empleo, tienen en la explicación del crecimiento económico de estos países. Además, la estructura de la población también parece afectar la desigualdad de género en el trabajo total, ya que el cuidado de las personas juega un papel importante. Las proyecciones de población en estos países pueden ayudar a proponer posibles tendencias en las desigualdades de género en el tiempo total.

El hecho de que las mujeres dediquen más tiempo al trabajo total que los hombres puede indicar que las mujeres pueden tener un menor bienestar en estos países. Como recomendaciones en cuanto a políticas públicas, las políticas familiares que desafían la estructura de género existente, como la licencia de paternidad o los esquemas tributarios basados en el género con mayores tasas impositivas marginales para los hombres (Alesina et al. 2011), pueden constituir un buen punto de partida para desplazar con éxito la división doméstica del trabajo en una dirección más igualitaria entre hombres y mujeres. Además, una de las fuentes de la desigualdad de género es el cuidado del resto de miembros del hogar, pudiéndose utilizar en este campo varias estrategias para fomentar una distribución más equitativa de las actividades de atención, donde la implementación de centros de atención pública, pagos en efectivo o beneficios fiscales puede servir como fuente de igualdad de género.

A pesar de que ofrecemos una visión general del tiempo dedicado al trabajo total, los datos utilizados no nos permiten considerar cuestiones como la calidad o la intensidad del tiempo dedicado al trabajo. Floro y Pichetpongsa (2010) analizan la intensidad del trabajo de los trabajadores de Thailandia y encuentran que las trabajadoras experimentan una mayor incidencia de intensidad laboral y, por lo tanto, una menor calidad de vida en comparación con los trabajadores. Para futuras investigaciones de países latinoamericanos, una extensión sería analizar estas desigualdades entre hombres y mujeres respecto a la intensidad del tiempo que los mismos dedican a sus actividades y su experiencia personal respecto al uso de su tiempo, de tal forma que los responsables de políticas públicas podrían diseñar programas más efectivos y políticas económicas y sociales. En investigaciones previas, llevadas a cabo en países desarrollados, se han medido las diferencias en las experiencias diarias de satisfacción en el uso del tiempo (Kahneman et al., 2004; Kahneman y Krueger, 2006; Knabe et al., 2010; Connelly y Kimmel, 2015;

Gimenez-Nadal y Molina, 2015), por lo que esta evidencia, podría usarse como guía para medir las experiencias diarias de uso del tiempo en los países latinoamericanos.

A partir de los resultados encontrados en el Capítulo I, en los que se observan comportamientos diferentes en el uso del tiempo en el trabajo total entre hombres y mujeres, en el segundo Capítulo de la Tesis, y desde una aproximación unitaria, analizamos en profundidad cómo las mujeres trabajadoras clasificadas en auto-empleadas y asalariadas dedican su tiempo al trabajo remunerado, al trabajo no remunerado o doméstico y al cuidado de niños, utilizando para ello las encuestas de uso del tiempo de México, Perú, Ecuador y Colombia. Nuestros resultados muestran que las madres auto-empleadas dedican menos tiempo al trabajo remunerado y más tiempo al trabajo no remunerado y al cuidado de niños en los cuatro países en comparación de las madres asalariadas.

Partiendo de estos resultados, clasificamos el cuidado de niños en dos categorías: el cuidado educativo y el cuidado no educativo de los niños. El interés principal de esta clasificación es poner el énfasis en aquellas actividades dirigidas a incrementar el capital humano de los niños, estando enmarcadas dentro del cuidado educativo. Con respecto al cuidado educativo, encontramos que las madres auto-empleadas de México, Ecuador y Colombia dedican más tiempo a esta actividad en comparación con sus homologas asalariadas y, además, factores como la educación influyen en los patrones de comportamiento entre las madres auto-empleadas y las asalariadas. En este sentido, las diferencias entre las madres auto-empleadas y las asalariadas en el tiempo dedicado al cuidado educativo aumenta con el nivel de educación en México, Ecuador y Colombia.

Estos resultados respaldan la hipótesis de que el trabajo por cuenta propia puede ayudar a las madres a equilibrar su trabajo y sus responsabilidades domésticas, teniendo un mayor control sobre su asignación de tiempo. El hecho de que muchas madres auto-empleadas dediquen comparativamente más tiempo al cuidado educativo de sus hijos en comparación de las madres asalariadas tiene implicaciones importantes, ya que el capital humano de los niños es un factor fundamental para sus resultados presentes y futuros. En el contexto de las recomendaciones de políticas públicas, es importante indicar que, a pesar de los incrementos considerables en los últimos años en la participación de las mujeres latinoamericanas en el mercado de trabajo, la participación en estos países sigue siendo baja en comparación con los países desarrollados, ya que casi la mitad de las mujeres de América Latina y el Caribe en el tramo de edad 15-64 están todavía fuera del

mercado de trabajo (Mateo-Díaz y Rodríguez-Chamussy 2016). En este sentido, los gobiernos deben realizar los esfuerzos necesarios para garantizar que cada vez más mujeres se incorporen en el mercado de trabajo como asalariadas o auto-empleadas. La baja participación de las mujeres en el mercado de trabajo implica una mayor probabilidad de transmisión intergeneracional de la pobreza y la desigualdad (Mateo-Díaz y Rodríguez-Chamussy 2016). Así, las características de algunas mujeres como una mayor edad, los bajos niveles de educación o las responsabilidades domésticas (Heller 2010; Mondragón-Vélez y Peña 2010) dificultan el acceso de estas mujeres al sector asalariado y, dada su necesidad de ingresos, se plantean acceder al mercado de trabajo como auto-empleadas.

En este contexto, con el fin de fomentar el auto-empleo entre mujeres que no pueden acceder al sector asalariado, es necesario que los responsables de políticas públicas fomenten el emprendimiento en estos países. Como señala Baumol (2008), para que cualquier economía prospere en el futuro, es necesario promover el espíritu emprendedor, siendo necesario que las políticas públicas fomenten las actividades de las pequeñas empresas. Las políticas correctas ayudarían a los auto-empleados no solo a crear sus propios empleos, sino también a crear nuevos empleos, contribuyendo de esta forma a reducir la tasa de desempleo (Congregado et al., 2010). Para que se pueda dar esta circunstancia, es necesario que las mujeres tengan acceso al crédito para sus negocios. Sin embargo, en los países de América Latina, la mayor parte de las pequeñas y medianas empresas se enfrentan a serios problemas para acceder al crédito, siendo estos problemas mayores cuando las mujeres solicitan los créditos (Heller 2010). Como sostienen Cheston y Kuhn (2002), es importante que los gobiernos apoyen el microcrédito y las microfinanzas, junto con la capacitación para actividades comerciales, dado que estas estrategias son clave para luchar contra la pobreza.

Con respecto al cuidado educativo, el hecho de que las madres auto-empleadas dediquen comparativamente más tiempo a este tipo de cuidado plantea la cuestión de si los hijos de estas madres auto-empleadas realmente disfrutarán de un mayor capital humano, lo que se reflejaría en mejores resultados en la escuela y/o en el mercado laboral, en comparación con hijos de madres asalariadas. Si encontráramos diferencias, significaría que el acceso a los servicios de cuidado infantil o guardería se distribuye por igual entre las madres y el auto-empleo fomentaría las diferencias entre los niños. Si no encontráramos diferencias, significaría que el acceso a los servicios de cuidado infantil

no se distribuye por igual entre las madres y favorecería a las madres asalariadas, de tal forma que el auto-empleo sería una herramienta para cubrir esta brecha. Los datos utilizados en este Capítulo no nos permiten responder estos interrogantes, dejando esta línea abierta para investigaciones futuras.

A diferencia de las aproximaciones unitarias/individuales mostradas en los capítulos I y II de esta tesis, en el tercer Capítulo y desde un enfoque colectivo, analizamos la provisión de trabajo de mercado en parejas de países latinoamericanos, en el marco del modelo colectivo de oferta laboral propuesto por Chiappori et al. (2002). Utilizando los datos de las encuestas de uso del tiempo de México (2009) y Colombia (2012), nuestros resultados econométricos muestran que la racionalidad colectiva no es rechazada en los dos países estudiados, lo que apoya la existencia de la eficiencia de Pareto en las decisiones que toman las parejas tanto de México como Colombia. Encontramos en los dos países, que el salario de las mujeres está relacionado positivamente con su propia oferta de trabajo.

Para el caso de México, el salario de los hombres y los ingresos no laborales de los hogares están relacionados positivamente con la oferta de mano de obra masculina, y la presencia de niños está negativamente relacionada con la oferta laboral de las mujeres. Los hombres de los dos países muestran un comportamiento altruista hacia las mujeres con el aumento de su ingreso laboral y los ingresos no laborales del hogar benefician a las mujeres en Colombia. El índice de masculinidad (sex-ratio) analizado como un factor de distribución, beneficia a las mujeres en Colombia, ya que un aumento en esta proporción se relaciona con las transferencias monetarias de hombres hacia las mujeres. Los resultados obtenidos en este Capítulo ponen de manifiesto la validez del modelo colectivo para México y Colombia, mostrando la existencia de procesos de decisión en el hogar que son eficientes en Pareto.

En cuanto a las recomendaciones directas en términos de políticas públicas, observamos que en México la presencia de niños está negativamente relacionada con la oferta de mano de obra femenina. El uso de servicios formales de cuidado de guardería es limitado en estos países, especialmente para niños más pequeños entre 0-3 años (Mateo Díaz y Rodriguez-Chamussy 2016). Como indica Araujo et al. (2013), hay problemas en el acceso a los servicios de guardería, principalmente en las áreas rurales y, en este sentido, es necesario que los gobiernos hagan todo lo posible para que la mayoría de los hogares con niños pequeños puedan tener acceso a los servicios de guardería. Autores

como Hallman et al. (2005) para Guatemala, Mateo Díaz y Rodriguez-Chamussy (2016) para México y para Contreras et al. (2012) para Chile, muestran los beneficios de los servicios de cuidado de niños y su efecto positivo en las horas de trabajo de las mujeres. Además, en ambos países, los hombres muestran un comportamiento altruista con el incremento de sus ingresos laborales, mientras que las mujeres no lo hacen. Estos resultados pueden indicar que los programas de ingresos y/o subsidios tendrán diferentes impactos en la desigualdad del hogar, dependiendo del receptor de la transferencia. De acuerdo con nuestros resultados, las transferencias a hombres serían más útiles para reducir las desigualdades dentro del hogar, ya que en esos hogares ocurre una transferencia de los hombres hacia las mujeres. Políticas públicas deberían considerar estos resultados al diseñar políticas eficientes destinadas a reducir las desigualdades en los hogares.

El análisis realizado en este tercer Capítulo se limita a la oferta laboral de individuos, a pesar de que el tiempo que las personas dedican a actividades no remuneradas, como cuidado de adultos/niños o tareas domésticas, es una importante fuente de desigualdad dentro de los hogares. La forma lógica de extender nuestro análisis sería la inclusión del tiempo de trabajo no remunerado, al igual que Rapoport et al. (2011). Dejamos esta inquietud abierta para una futura línea de investigación.

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