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EFFECT OF HOME CARE ACTIVITIES ON LABOR PARTICIPATION IN A DEVELOPING COUNTRY

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ABSTRACT. This article analyzes the differences in labor participation due to home care activities in Colombia. Indirect and direct care activities can be inside or outside the market sphere. For example, a domestic service worker provides indirect and, sometimes, direct care services. A high percentage of care activities are delegated to women because these tasks are supposedly proper for their gender and are a natural part of their daily lives. To understand the disadvantaged position of women in the labor market, their participation in unpaid work must be considered. Our results show that gender stereotypes continue to overburden Colombian women in unpaid activities. Variables such as age, schooling, sex, and household headship are relevant when direct and indirect caregiving activities are included in the analysis of labor participation.

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Introduction

Feminist economics and other disciplines have reevaluated the classic concepts of work to make visible the care activities that are unpaid but play a fundamental role in people's daily well-being (Pollak & Wachter, 1975; Folbre, 2006; Lilly et al., 2007; Meng, 2013; Moreno, 2018). The reproduction of modern societies is based on women's free labor because such work is outside the exchange (market). A high percentage of these activities are attributed to women under the idea that these tasks are proper for their gender and are a natural part of their daily lives (Amarante & Rossel, 2018; Ferrant et al., 2014; Sevilla-Sanz et al., 2010). The greater time women spend in these types of activities affects their opportunities in education and participation in the labor market (Freije & Lopez-Calva, 2001; Assaad et al., 2010).

Studies of women's labor participation have been conducted using proxy variables to the time spent undertaking caring tasks in households, such as the number of children or the

household composition, but not variables about caregiving activities (Pagano et al., 2010; Castro et al., 2011). This article makes advances in that direction since recent time-use surveys make it possible to directly use caregiving hours to study women's labor participation.

Achieving understanding regarding the disadvantaged position of women in the labor market involves considering their participation in unpaid work. The division of household labor by gender weakens women's status and segregates them into precarious segments of the same market. The women's weakened position contributes to dividing the labor in the domestic sphere by keeping women dependent on men. Thus, it can be argued that unequal participation in the labor market facilitates the perpetuation of the division of labor in the family based on gender. Therefore, the dynamics of women's labor inequality can only be analyzed by considering unpaid household work (Gammage & Orozco, 2008; p. 8). How these activities affect the labor participation of Colombian women and the regional differences in participation are unexplored topics that have become more evident with the data of the recent time-use survey (ENUT) conducted in Colombia since 2013 as part of Law 1413 adopted in 2010. It is critical to advance gender equity in Colombia, including the care economy and the existing imbalance against women's work in the public policy agenda.

As the decision to participate in the labor market is related to caregiving activities at home, two bivariate probit models estimate this joint probability. The dependent variables of labor participation and indirect care are considered in the first model. In the second model, the joint probability of labor participation and direct care is calculated, considering the characteristics of individuals as independent variables and the region as a control variable. Indirect care activities are necessary for direct care of people, such as preparing meals, taking care of clothes, maintaining the environment (cleaning and maintaining the home), and carrying out shopping and household errands. Direct care of people involves developing interpersonal relationships (Folbre, 2006; p.187). Indirect and direct care activities can be inside or outside the market sphere. For example, a domestic service worker provides indirect and, sometimes, direct care services. Private educational and health services constitute direct care services in the market, whereas unpaid care performed by individuals in their homes, whether direct or indirect, is non-market production (DANE 2015). Households' needs for care services can be met by combining the care obtained exogenously and produced in the household. To some extent, there is substitutability between the care offered by the market and that produced by households, but substitutability depends on the type of care. Because of their emotional and intrapersonal content, direct care services seem to have much lower substitutability than indirect care (Folbre, 2006; p.187). Therefore, their impact on deciding whether to take part in the labor market may differ. Given the particularities of these caregiving activities, it is understandable that the impact of hours spent on direct or indirect care are considered separately.

The main contribution of our article is to discuss the research hypothesis that engagement in direct or indirect care activities significantly influences the probability of individuals participating in the labor market using bivariate probit models in Colombia.

Our results show that the probability of participating and caring directly, for 10- and 18-year-olds, decreases by six percent, and the probability of participating in the labor market and having indirect caregiving activities decreases by 11.3 percent. That is, more than five percent points of the difference between labor participation due to care activities when we considered individuals between 10 and 18 years old. Finally, the article is structured into five sections, namely: introduction, literature review, theoretical model, empirical strategy, results, and conclusions.

1. Literature review

During the past decades, changes in the labor market have reduced the participation gap between men and women. These changes are associated with essential variations in demographic, cultural, and economic factors; however, the most significant is the perception, by different cohorts of women, of an increase in the cost of fertility associated with an increase in the return to education and changes in the structure of households, related to joint decision-making processes to divide time (Torres & Méndez, 2003; p.111).

These changes have been studied in Colombia and worldwide using household, demographic, and health surveys and, to a lesser extent, time-use surveys. An example of these studies is that of Shimizutani and Noguchi (2008), who used a difference-in-differences model to analyze the introduction of Japan's public long-term care insurance scheme. They found that introducing the scheme did not affect female labor market participation in 2001 but had a significant and positive effect in 2002. Lilly et-al. (2007) evaluated international evidence on unpaid caregivers and their labor market choices, highlighting that caregivers are just as likely to be in the labor force as non-caregivers; caregivers are more likely to work fewer hours in the labor market than non-caregivers, and compared with non-caregivers, only those involved in caregiving are more likely to withdraw from the labor market. Using a panel data model from 2001 to 2007, Meng (2013) examined female and male caregivers in Germany. He explained that because caregiving may be endogenous to the labor supply decision, he employed the characteristics of care recipients as instruments and controlled for unobserved heterogeneity in the sample using the panel structure. The results revealed that having an individual in need of care at home does not decrease labor supply by an economically relevant amount.

Konker and Memiş (2017) studied gender patterns in time use across the household life cycle in Turkey. They employed time-use survey data in 2006 and probit and Tobit models and found that over the life cycle, women's total workload increased relative to that of men, besides work-family reconciliation policies, based on assuming women's role as caregivers, exacerbated gender disparities in time use. Pagano et al. (2010) analyzed the joint determinants of fertility decisions and female labor supply in Uruguayan households using a bivariate probit model. The results confirmed the presence of endogeneity between both processes, revealing the existence of unobservable factors that make women with the highest propensity to work the least likely to have a child. Ferrada and Zarzosa (2010) analyzed women's participation in the Chilean labor market by region using a full information estimator, combining unrelated regressions (SURE) and logit models. Sánchez, Herrera, and Perrotini (2015) studied female labor participation and its relationship with time used in unpaid domestic work. The authors employed a Heckman selection model to correct sample choice bias. They found that the hours that women spend caring for children and the elderly at home and producing goods within the home negatively affected their hours of paid work.

In Colombia, Alvear (2011) analyzed whether household structure, as a proxy mechanism for the mother's time in the household, determined women's labor participation with preschool-age children and whether it affected women's recent fertility decisions in urban Colombia. Probit models, viewed in reduced form for women's labor participation and for recent fertility, were used. One of the findings was that the family structure determined the possibility of inserting the labor market for women with children under five years of age. Mora (2013) discussed the effects of remittances on labor market participation. The researcher found that remittances were crucial for women because, unlike men, women spent remittances on their families' education, which affected their labor market participation. Using the Internet as an instrument to model the endogeneity of remittances was also discussed. González and Daza (2015) studied the determinants of labor participation in Colombia. They estimated probit

models and established participation profiles based on the conditional probabilities of four groups of women and men of different age ranges. They concluded that attaining higher education levels, having a retirement pension, and having minors in the household explain these dynamics. Castro, García, and Badillo (2011) discussed the labor participation of married women and their spouses in Colombia using a related decisions approach. They analyzed the determinants of married women and their spouses' labor participation as a family decision. They estimated a bivariate probit model corrected for selection bias. They showed that the couple's decision to take part in the labor market is interdependent and affected by human capital endowment, school-age children, household economic conditions, indicators of labor demand, and regional characteristics. Molinos (2012) analyzed the impact of the ruling of C-470 of 1997, which established the nullity of dismissal and the order to reinstate a pregnant worker on female labor participation in Colombia. Using a difference-in-differences model, the author found that changing the norms about maternity in working life harms employment possibilities. Finally, using the decomposition of nonlinear models, Pérez (2016) estimated logit models to determine whether having children affects labor participation, thus leading to an expulsion effect. No evidence was found in favor of the phenomenon. On the contrary, in 2015, women with children under six years participated more than their counterparts without children.

Labor participation and the family production model.

The neoclassical labor market model is the theoretical approach mostly used to study labor participation. In this model, the individual must decide how to divide his or her fixed time (T) between the market and personal or domestic activities. These models overlook that time can be spent on activities unrelated to leisure or consumption. Using the same neoclassical logic of utility maximization, Becker (1960), Becker (1965), Heckman (1974), Becker and Lewis (1973), Willis (1973), Pollak and Wachter (1975), Becker (1981), and Becker (1985) explored the relationship between women's increased participation and changes in demographic dynamics, revealing that the time of household members is one of the essential variables to consider when trying to understand the logic behind the labor market and its differential impact on men and women (Alvear, 2011). Other important models are the family production models of Reuben Gronau (1986), on which this study is based. Reuben Gronau (1986) proposed that individuals make certain decisions after negotiating within the household or between spouses.

Cooking meals, washing clothes, cleaning the house, or caring for household members are part of an individual's daily life. Although these activities can be purchased in the market, deciding to perform or buy them depends on individuals' preferences, the cost-effectiveness of performing them independently versus being employed, the prevailing prices, and their income. Thus, an individual's utility function is as follows:

$$U = U(C, L) \tag{1}$$

To simplify the model, we omit the parameter β , representing tastes, and the parameter P , representing personal characteristics. An individual can buy consumer goods or produce them domestically, i.e., $C = C_M + C_D$. The total time available for non-market activities is $L_T = L + h_D$, where L is leisure, and h_D is the number of hours devoted to household chores. This individual can convert time at home into household consumption using the household production function, where $C_D = f(h_D)$, and $f'(h_D) > 0$ and $f''(h_D) < 0$, implying that f is increasing and concave. The total income comes from labor income (w_M) and independent income (v). The individual maximizes his utility function (1) subject to the following budget constraint:

$$C + wL \leq [f(h_D) - wh_D] + v_0 \quad (2)$$

Note that $h_M = L_T - h_D - L$ and $C = C_M + C_D$, where $v_0 = wL_T + v$ is the maximum income, the individual can obtain if he/she spends all his/her time working in the market. The individual must decide on the amount of time to spend on leisure activities (L), the amount of time to consume goods ($C = C_M + C_D$), and the amount of time to spend on household activities (h_D). The optimal solutions, $C^* = C_M + f(h_D^*)$ and L^* , are defined by the following equation,

$$\frac{U_L(C^*, L^*)}{U_C(C^*, L^*)} = w = f(h_D^*) \quad (3)$$

In equation (3), the individual dedicates his/her time to home production until the market wage rate or his/her marginal productivity in the market equals his/her marginal productivity at home. (Acosta et al. 2007; p. 149)

2. Methodological approach

Model and data variables

We use a bivariate probit model because labor participation and care activities are correlated. Thus, the probability of participating in the labor market will relate to the hours men and women devote to care activities at home. If the correlation in the disturbance terms allows modeling decisions that are related, such as labor participation and caregiving activities in the household, then,

$$\begin{aligned} y_1^* &= X_1' \beta_1 + \varepsilon_1, y_1 = 1 \text{ if } y_1^* > 0, 0 \text{ otherwise} \\ y_2^* &= X_2' \beta_2 + \varepsilon_2, y_2 = 1 \text{ if } y_2^* > 0, 0 \text{ otherwise} \\ \begin{bmatrix} \varepsilon_{i1} \\ \varepsilon_{i2} \end{bmatrix} (X_1, X_2) &\sim \text{Bivariate Normal} \left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \sigma^2 \begin{bmatrix} I & \rho I \\ \rho I & I \end{bmatrix} \right) \end{aligned} \quad (4)$$

where the independent variables y_1 and y_2 are dichotomous variables; y_1 refers to participation in the labor market and y_2 to caregiving activities at home; β_1 , β_2 , and ρ are parameters. With respect, y_2 is a dichotomous variable based on people who dedicate almost 244 minutes per day to any care activity (the average in minutes dedicated to direct and indirect care activities is 122 minutes per day). This value implies that the person dedicates time equivalent to half a working day to caring activities at home, and as a result, this could affect the person's labor participation. Conversely, X is a vector that includes age, sex, education, ethnicity (Afro-descendant), head of household, marital status, and region variables.

The data used correspond to the 2018 ENUT. The period of data collection occurred from September 2016 to August 2017 (52 weeks). The ENUT provides geographical representation for the entire country, encompassing municipal capitals, the overall count of populated centers, and scattered rural areas, as well as six regions: Bogotá, San Andrés, Caribbean, Eastern, Central, and Pacific. The survey was devised and executed across 44,999 households to collect comprehensive data on residences, households, and individuals, adhering to a conventional household survey framework. 121,855 observations were used, but only the population aged ten years and above was included (see Table 1).¹

¹ Updating the dataset is unfeasible due to limitations inherent in the Time Use Survey in Colombia, which has only undergone three iterations, with the latest conducted in 2020 and 2021. Notably, the data collection for the latter period occurred via telephone amidst the pandemic, resulting in the omission of several questions pertinent to our study. Consequently, replication of the study with data from this period is impossible

Table 1. Variables used in the bivariate probit

Variables			
Dependents	Definitions	Descriptive statistics	
Labor participation (y_1)	= 1 participate = 0 not participate	Participates =60,681 (49.8%) Not participate = 61,174 (50.2%)	
Indirect care activities (y_2)	=1 If the hours of indirect care exceed 244 minutes per day, they exceed the half working day. = 0 otherwise	Indirect care above threshold = 34,996 (26.14%) Indirect care below threshold = 98,894 (73.86 %)	
Direct care activities (y_2)	=1 If direct care hours exceed 244 minutes per day = 0 otherwise	Direct care above threshold = 30,650 (22.89 %) Direct care below threshold = 103,240 (77.11 %)	
Independents			
Dummy for 10 to 18 years old	if the individual is between 10 and 18 years old. =0 otherwise	Age 10-18 = 21,391 (15.9%) Otherwise = 112,499 (84.02%)	
Dummy for 19 to 30 years old	=1 if the age of the individual is between 19 and 30 years. =0 otherwise	Age 19-30 = 27,944 (20.87%) Otherwise = 105,946 (79.13 %)	
Dummy for 31 to 40 years old	=1 if the individual is between 31 and 40 years old =0 otherwise	Age 31-40 = 19,619 (14.65 %) Otherwise = 114,271 (85.35%)	
Woman	= 1 Woman = 0 Man	Women = 70,676 (52.8 %) Mens= 63,214 (47.2 %)	
Afro-descendant	= 1 if they recognize themselves as Afro-descendant, Palenquero or Raizal = 0 otherwise	Afro-descendant = 10,949 (8.18%) Otherwise = 122,941 (91.82%)	
Education	Number of years of formal education approved.	Average = 8.18 years old	
Head of household	= 1 if the individual is the head of the household = 0 otherwise	Head of household = 43,648 (32.60%) Other position at home = 90,242 (67.4%)	
Marital status	= 1 If the individual is married or in a domestic patnership= 0 otherwise	married or in a domestic patnership=56,432 (42.15%). Otherwise = 77,458 (57.85%)	
Region	Caribbean	31,528 (23.55%)	
	Central	32,373 (24.18%)	
	Eastern	22,237 (16.61%)	
	Pacific	21,582 (16.12%)	
	Bogotá	22,904 (17.11%)	
	San Andrés	3,266 (2.44%)	

Source: DANE. National Survey of Time Use. ENUT 2018. Own elaboration.

Table 1, shows the labor participation is around 49.8%. Age has been used as a variable in labor participation models (Pérez 2016; Charry 2003; González-Quintero and Daza Báez 2015; Castro et al. 2011; Mora 2013), with results revealing that younger individuals are less likely to take part. As the age of individuals increases, the probability of participating in the labor market also increases. After age 40, the probability of participating in the labor market

decreases. Age is also a variable in direct and indirect caregiving activities, as the hours dedicated to these activities increase with age (Duque García, 2015; DANE, 2015; Moreno-Salamanca, 2018; Osorio Pérez, 2015). The difference between men and women has been studied in issues related to the labor market due to the existing gap between men and women in labor supply (Pérez, 2016; Restrepo et al., 2015; Molinos, 2012; Martínez, 2013; Kongar & Memiş, 2017; Castro et al., 2011). In terms of caregiving, time-use surveys reveal a wide divergence in the number of hours devoted to caregiving by men and women (Moreno-Salamanca, 2018; Osorio Pérez, 2015; Shimizutani et al., 2008; Sánchez et al., 2015). Of course, we also observed differences between labor participation,

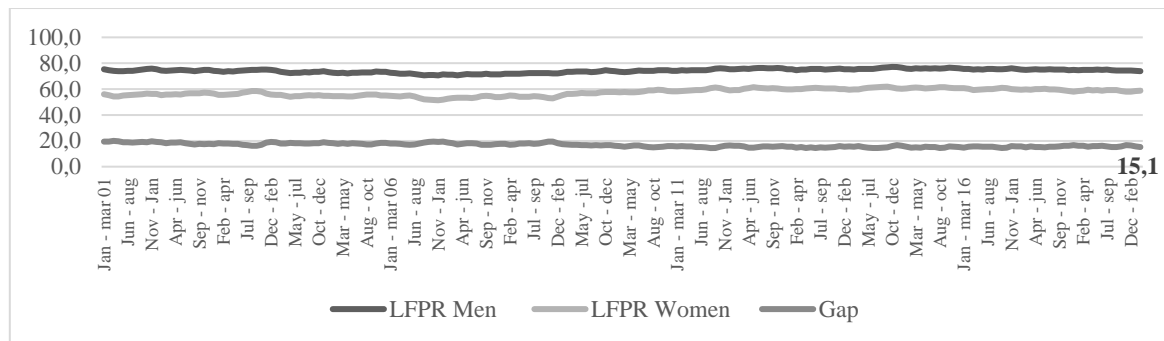


Figure 1. Gap in the Labor Force Participation Rate

Source: Own elaboration with data from DANE - Great Integrated Household Survey (Total 13 cities and metropolitan areas. 2001-2019).

In figure (1), the labor participation gap (LFPR men – LFPR women) in 2001 was around 20 percentage points and has decreased over the last two decades, but remains wide at around 15 percentage points, and according to the results of ENUT (2018), men's daily participation in paid activities is 55.8 percent, while women's participation is 34.8 percent. The gap widened in unpaid work as men had 63.1 percent and women 89.4 percent participation. Ethnicity, head of household, schooling, and marital status also help to explain labor participation. Alvear (2011), Acosta, Peticara and Ramos (2007), Pérez (2016), Charry (2003), Martínez (2013), Mora (2013), González-Quintero and Daza Báez (2015), Torres and Méndez (2003), and Folbre (2006); Kongar and Memiş (2017) found effect of these variables on labor participation. Lilly, Laporte, and Coyte (2007) studied the relationship between these variables and caregiving. From the theoretical model, these aspects of family life affect households' decisions about the activities of their members in both the labor market and at home. The regional component is considered a control variable because unobserved regional differences affect the participation of both men and women in the paid labor market and their personal lives.

Historically, labor participation by regions in Colombia reveals that the Caribbean region has had the lowest participation rates. The Pacific and Eastern regions have had the highest participation rates during the entire period. Colombia's natural regions are territorial divisions based on the heterogeneous characteristics of the country's relief, climate, vegetation, and soil types. In 13 cities and their metropolitan areas in the country, men have higher participation (74.4 percent) in the labor market than women (58 percent).

3. Conducting research and results

Two bivariate probit models are estimated. In the first model, we estimate labor participation and indirect care; in the second model, we estimate labor participation and direct

care. The coefficients of both models are significant, as is the ρ statistic, providing significant statistical evidence that the biprobit model is adequate.

Table 2 presents the results of the estimate. The signs are as expected, except with the age range 10 to 18 years old and direct care, where a negative sign is expected.

Table 2. Estimates of the biprobit model of labor participation and care activities

	Model 1		Model 2	
	Joint estimation of the probability of engaging in the labor market and assuming responsibility for indirect caregiving activities.		Joint estimation of the probability of involvement in the labor market and assuming responsibility for direct caregiving activities.	
	Participation (y_1)	Indirect care (y_2)	Participation (y_1)	Direct care (y_2)
Dummy for 10 to 18 years old	-1.57216*** (0.0186)	-0.920014*** (0.0216)	-1.58359*** (0.0185)	0.072586*** (0.0194)
Dummy for 19 to 30 years old	0.214928*** (0.0113)	-0.284570*** (0.0139)	0.2158372*** (0.0113)	0.639904*** (0.0138)
Dummy for 31 to 40 years old	0.593118*** (0.0121)	-0.112194*** (0.0134)	0.59043023*** (0.0120)	0.539351*** (0.0134)
Woman	-0.95511*** (0.0090)	1.403808*** (0.0136)	-0.96100142*** (0.0090)	0.7787541*** (0.0109)
Afro-descendant	0.019302 (0.0169)	-0.0508504* (0.0201)	0.01894796 (0.0169)	-0.01043721 (0.0192)
Education	0.056251*** (0.0010)	-0.013126*** (0.0011)	0.05677861*** (0.0010)	0.0100266*** (0.0012)
Head of household	0.374066*** (0.0095)	0.068959*** (0.0114)	0.37262947*** (0.0095)	0.1741644*** (0.0115)
Marital status	0.010321 (0.0088)	0.4170667*** (0.0108)	0.01547481 (0.0088)	0.5615936*** (0.0109)
Region				
Central	0.07330215*** (0.0120)	0.2705571*** (0.0136)	0.07266879*** (0.0120)	-0.0387090** (0.0143)
Eastern	0.10781882*** (0.0133)	0.1687908*** (0.0153)	0.10571657*** (0.0133)	0.5510249*** (0.0145)
Pacific	0.08115185*** (0.0136)	0.1496419*** (0.0155)	0.0796690*** (0.0136)	.27888107*** (0.0152)
Bogotá	0.22076909*** (0.0132)	0.01008066 (0.0158)	0.22045638*** (0.0133)	-0.189751*** (0.0162)
San Andrés	0.49390564*** (0.0294)	-0.521818*** (0.0431)	0.49760643*** (0.0296)	-0.178268*** (0.0365)
constant	-0.15465421***	-1.89754***	-0.15655772***	-2.35799***
Rho	-0.38567655***		-0.11636202***	

N =121,855

Source: DANE. National Survey of Time Use. ENUT 2018. Own elaboration

Note: Standard errors in parentheses; *** p < 0.01; ** p < 0.05; * p < 0.1

Table 2, show the Afro-descendant variable is not significant for participation and direct care. Marital status is not significant for labor participation but for direct and indirect caregiving activities. In the case of indirect care for individuals between 10 and 18 years, the probability of participating in the labor market and indirect care activities decreases, which makes sense for children and youth in this age range. When the outcome of this same variable is evaluated in direct care, the probability of participating in the labor market decreases. However, the probability of participating in direct care activities increases. Although this result may be counterintuitive, the difficulty of substituting these types of activities in any age range can explain the sign.

The probability of participating in the labor market increases in the following two age ranges. With caregiving, the probability of being in the indirect caregiving range above 244 minutes per day decreases as the age range increases. Regarding direct caregiving, as age increases, the probability of engaging in direct caregiving activities more significant than 244 minutes per day also increases. These results can be explained because, as age increases, individuals entering the labor market can substitute care activities in the home for care services provided by the market but not for direct care, which is difficult due to the bonds of affection among household members.

With women, participating in remunerated activities decreases the possibility of men's participation, but women's possibility of caring directly or indirectly increases than that of men. This result reinforces the literature findings on how gender patterns place women in different places than men in paid and unpaid domains. Schooling is significant for participation, and the two types of care and the signs are as expected. When schooling increases, the probability of participating in the labor market also increases, and the decrease in the probability of participating in direct care activities can be explained by the possibility of substituting indirect household care in the market. The positive sign in direct care makes sense because these activities do not have close substitutes in the market. With the household head, the positive sign in all cases means that the participation probability and direct and indirect caregiving activities increase for household heads more than those who are not. With marital status, the empirical evidence needs to be more conclusive. Compared with those who are single, being married or in a union increases the probability of engaging in caregiving activities of over 244 minutes per day. The region is significant in almost all caregiving activities and labor participation cases. This result is evidence of unobserved phenomena that affect labor participation inherent in the regions and direct and indirect caregiving activities, and it is worth exploring the regional differences in both cases.

Tables 3 and 4 present the marginal effects of labor participation and direct/indirect care. In each table, two scenarios are considered. In the first, individuals take part in the labor market and caregiving. In the second scenario, they do not participate in the labor market but in caregiving activities

Table 3. Marginal effects for labor participation and indirect care.

	Participation and indirect care	Not participate in the labor market and indirect care
	The marginal effects pertain to alterations in the joint probability of non-engagement in the labor market and undertaking indirect caregiving activities, in reaction to shifts in the explanatory variables.	The marginal effects pertain to alterations in the joint probability of non-engagement in the labor market and engagement in indirect caregiving activities, in reaction to shifts in the explanatory variables.
Dummy for 10 to 18 years old	-0.113*** (0.0018514)	-0.067*** (0.0032988)
Dummy for 19 to 30 years old	-0.008*** (0.0008491)	-0.047*** (0.0020842)
Dummy for 31 to 40 years old	0.016*** (0.0008402)	-0.038*** (0.0020529)
Woman	0.045*** (0.000978)	0.231*** (0.0018199)
Education	0.001*** (0.0000741)	-0.003*** (0.0001703)
Head of household	0.018*** (0.0007199)	-0.004*** (0.0017139)
Marital status	0.024*** (0.0007166)	0.057*** (0.0015621)
Region		
Central	0.018*** (0.0008759)	0.036875*** (0.002133)
Eastern	0.013*** (0.0009289)	0.0195206*** (0.0022909)
Pacific	0.010*** (0.0009014)	0.0178473*** (0.002298)
Bogotá	0.007*** (0.0008721)	-0.0057374*** (0.0020394)
San Andrés	-0.008*** (0.0012612)	-0.0544354*** (0.0025473)

Source: DANE. National Survey of Time Use. ENUT 2018. Own elaboration

Note: Standard errors in parentheses; *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

The marginal effects of participation and indirect caregiving are presented in the first column of Table 3. For people between 10 and 18 years old, the probability of participating in the labor market and having indirect caregiving activities (more than 244 minutes per day) decreases by 11.3 percent. With women, the probability of participating and making indirect care activities increases by 4 percent. In column two, we consider individuals who do not participate in the labor market but perform care activities. Results show that having indirect care activities decreases as the age range increases. With women, the probability of non-participation and indirect caregiving increases by 23 percent.

Table 4. Marginal effects for labor participation and direct care

	Participation and direct care.	Not participate in the labor market and direct care.
	The marginal effects pertain to alterations in the joint probability of engagement in the labor market and undertaking direct caregiving activities, in reaction to shifts in the explanatory variables.	The marginal effects pertain to alterations in the joint probability of non-engagement in the labor market and undertaking direct caregiving activities, in reaction to shifts in the explanatory variables.
Dummy for 10 to 18 years old	-0.065*** (0.0018778)	0.079*** (0.0024599)
Dummy for 19 to 30 years old	0.061*** (0.0012769)	0.062*** (0.0017093)
Dummy for 31 to 40 years old	0.016*** (0.0013099)	0.034*** (0.0017057)
Woman	0.020*** (0.0010491)	0.131*** (0.0014312)
Education	0.003*** (0.0001102)	-0.001*** (0.0001461)
Head of household	0.030*** (0.001034)	0.002* (0.0001461)
Marital status	0.046*** (0.0010214)	0.062*** (0.0013662)
Region		
Central	0.000 (0.0010192)	-0.007*** (0.0015737)
Eastern	0.061*** (0.0018439)	0.071*** (0.0023501)
Pacific	0.027*** (0.0014937)	0.031*** (0.0020913)
Bogotá	-0.005*** (0.0010812)	-0.024*** (0.0015217)
San Andrés	0.004 (0.0028053)	-0.031*** (0.0026024)

Source: DANE. National Survey of Time Use. ENUT 2018.

Note: Standard errors in brackets; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

The first column of Table 4 presents the marginal effects of participation and direct caregiving activities; in the first case, participation in the labor market and care activities, the probability of participating and caring directly decreases by 6 percent for individuals aged 10 to 18. In the other age range, we observed an increase in the probability of participating in the labor market and having direct care activities (more than 244 minutes per day) increases by 6 percent and 7 percent, respectively. Women's probability of participating in the labor market and having direct care activities increases by only 2 percent. Column 2 presents the joint effects of not participating in the labor market and having direct care activities. The probability of not participating in the labor market and having direct care activities increases by age range. In all age ranges, the probability increases by 3 to 7 percent. With women, the probability of direct

caregiving in a range greater than 244 minutes per day and of not participating in the labor market increases by 13.1 percent.

Conclusion

The recent availability of time-use surveys in Colombia, makes it possible to determine how activities in the private domain, especially care activities, impact remuneration or market activities. Gender roles that influence the unequal assignment of tasks to women are still present in Colombian society. Although Colombians perceive that the economic contribution of men and women should be equal, they leave women with the most significant responsibility for life-sustaining activities in the home.

Variables such as age, schooling, sex, and head of household are still relevant when direct and indirect care is included in the analysis of labor participation. As expected, when individuals' age and years of schooling increase, they can more easily substitute indirect care in households, buying these services in the market, thereby facilitating their participation in the labor market. The opposite occurs with direct care, where substitutability is much lower than indirect care. No market will replace love and bonding for personal care at home. Therefore, the probability of a woman taking part in the labor market and being in charge of 244 minutes of direct care per day is very low, which is only 2 percent. Most Colombian regions and a high proportion of Colombians (around 70 percent) still consider care and household maintenance activities connatural or women's work (because of their sex). This gender stereotype continues to overburden Colombian women in unpaid activities and marginalize them from paid activities, thus reinforcing women's economic dependence. Finally, we observed that the probability women allocate time to caregiving without engaging in the labor market is 23.1 percent for indirect caregiving and 13.1 percent for direct caregiving.

The consideration of public policy in the realm of caregiving raises pertinent questions: Can the state furnish caregiving services to relieve women of these responsibilities in their private lives, thereby enabling a more active participation in market activities? Is it more desirable for women to augment their engagement in remunerative pursuits, or conversely, should the emphasis be on paying caregiving activities? How can a more equitable distribution of caregiving responsibilities be attained? In cases where caregiving activities demonstrate regional disparities in their allocation, the ongoing discourse on regional caregiving systems should address these distinctions to provide context-specific solutions to caregiving needs, accounting not only for regional variations but also for rural or urban distinctions. Subsequent research endeavors should deepen our comprehension of the distribution of these activities in specific contexts, allowing national policy proposals to embrace the diversity of community and private caregiving practices in a nation as diverse as Colombia.

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