APRIL 2019

DISCUSSION PAPER SERIES NO. 2019-02

Counting Women's Work in the Philippines

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Abstract

Men and women play important and complementary roles in the economy. However, the activities that they perform are often valued differently, if at all. In this study, we provide new estimates of the value of men and women's work in the Philippines using the National Transfer Account and the National Time Transfer Account frameworks. We find that once the value of unpaid home production is taken into account, the contribution of women is closer to parity relative to those by men, as opposed to using only the value of paid market work. This is despite the fact that home production activities, which are largely performed by women, are paid lower market wages. Additionally, we document strong association between parental time and child schooling outcomes, which further emphasizes the contribution of unpaid housework in the economy.

Keywords: Gender, Work, National Transfer Account, National Time Transfer Account

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Counting women's work in the Philippines

Michael R.M. Abrigo and Kris Francisco-Abrigo[1]

1. Introduction

Gender disparities in access to opportunities, such is in education, employment, and even politics, have important ramifications not only to individual men and women and their families, but to society as a whole. One estimate, for instance, suggests that having women's economic participation at par with that by men could potentially increase the global Gross Domestic Product (GDP) by as much as USD28 trillion by 2025 (Woetzel, et. al., 2015). Taken in this light, it is therefore understandable why many public policies in recent decades have centered on encouraging greater women participation in the workforce.

Notwithstanding the many inroads in alleviating if not totally eradicating many forms of gender-based discrimination, particularly on access to education (cf. Barro and Lee, 2012; Grant and Behrman, 2010), benefitting from the so-called "gender dividend" (Agosin, et. al., 2000) may still be difficult to achieve. Harnessing the gender dividend by encouraging more equal participation among men and women in the labor market may not be very straightforward. In the Philippines for instance, only half of all working age women are in the labor force. This is despite the fact that the country is considered one of the most gender-equal countries all over the world – with women outpacing men in schooling outcomes.

On the one hand, this may be an indication of discrimination in the workplace, wherein women need to overcompensate in educational attainment to overcome female wage penalty (cf. Yamauchi and Tiongco, 2013). On the other hand, another strand of literature suggests that women, particularly mothers, may deliberately forego participation in the labor market in order to enrich their home environment (cf. Ruhm, 2008). Indeed, wages of working women may ease household budget constraints by providing additional resources available to households. However, employment also effectively limits the supply of time that may likewise be a crucial input to household quality, including the development of children (e.g., Popkin, 1980; Miller and Urdinola, 2010; Abrigo, 2016).

Although the evidences point to different mechanisms that mediate the low participation of women in the labor market, it all underscore the importance of work, regardless whether unpaid for home activities or paid in market wages. Yet, the value of time spent on unpaid housework are seldom documented, much less in official national statistics (cf. Collas-Monsod, 2010). In the Philippines, early attempts to incorporate the disaggregated contribution of men and women in national accounts and the value of unpaid home production include Virola and de Perio (1998) and Virola, et. al. (2007), although these were not officially adopted as part of the country's System of National Accounts.

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This research builds on these earlier works by providing new estimates of the contribution of men and women in the Philippine economy. Unlike in Virola and de Perio (1998) and Virola, et. al. (2007), however, we focus only on disaggregating the value of work, and exclude returns from capital. Further, we rely on a new set of complementary accounts, i.e., the National Transfer Accounts (NTA) and the National Time Transfer Accounts (NTTA), as guides in estimating the contribution of men and women's work in the economy. The NTA and NTTA are widely used national accounting frameworks that measure how much resources are generated, used and shared among different generations in an economy. We supplement these estimates by documenting the contribution of parental time on child schooling outcomes, the value of which, are not readily captured in either the NTA or the NTTA. This allows us to provide indications of the contribution of unpaid home production on household quality as measured by the "quality" of children.

Overall, the results we present here are qualitatively similar to those by Virola and de Perio (1998) and Virola, et. al. (2007), although the magnitudes differ. Based on NTA and NTTA estimates by sex, there appears to be some clear gender specialization on the time spent in and the value generated from paid market work and unpaid housework. However, when the income from paid market activities and the monetized value of unpaid home production are combined, the contribution of men and women are found to be more equal. Further, the results show that women work more hours on average, although the attributed market value to the activities that they perform may be lower. Finally, we also document a strong association between parental time, particularly of mothers, and child schooling outcomes that are distinct from the influence of parental educational background and household income.

Our results highlight the important roles that men and women play in the economy. Should women be delegated to stay at home? Not necessarily. What our results suggest, however, is that there is an important and quantifiable economic value to unpaid housework, which, of course, may be performed by both men and women. With the current gender distribution of housework, encouraging greater participation among women in the labor force may create a void inside homes that needs to be somehow covered by other household members or through other market mechanisms. Taken differently, women, especially mothers, may be more perceptive of taking up productive activities outside the home if the quality of their household, particularly of their children, is assured through some other compensatory means.

The rest of the paper is organized as follows. In the next section, we document lifecycle profiles of work in time units among men and women. In Section 3, we then ascribe market values for different types of work following the methodologies provided in the NTA and the NTTA. We supplement the market valuation of time by estimating the contribution of parental time on child schooling outcomes, which we present in Section 4. Finally, we conclude the report in Section 5 with a summary of the results and some implications for policy.

2. Work over the economic lifecycle

Important advances over the last half century helped shape how households are organized in the Philippines. In the immediate years after World War II, for instance, a woman may expect to have about seven or eight children on average throughout her lifetime. This has since been more than halved to around three births per woman in recent years. Further, time-saving devices, such as washing machines and refrigerators, are becoming more common features

among households in part as a result of rising incomes compounded by cheaper production costs. Together, these advances have allowed men and women, but especially women, more time away from home management and production, particularly of child care, to pursue more leisure and other productive activities.

However, despite these developments, female participation in the labor force has remained low in the Philippines, especially when compared to its East Asia neighbors. Between 1990 and 2015, labor force participation rate among women has increased only by less than three percentage points, reaching a high of 49.6 percent in 2015. Contrast this with other countries in the region, Singapore (60.8%), Thailand (61.0%), Vietnam (73.4%), Lao PDR (76.8%) and Cambodia (80.8%), where more than three in five women are in the labor force. That said, female labor force participation rate in the Philippines is much similar to its Austronesian neighbors Indonesia (48.9%) and Malaysia (50.3%), and to its richer neighbors Japan (49.9%) and South Korea (51.9%).

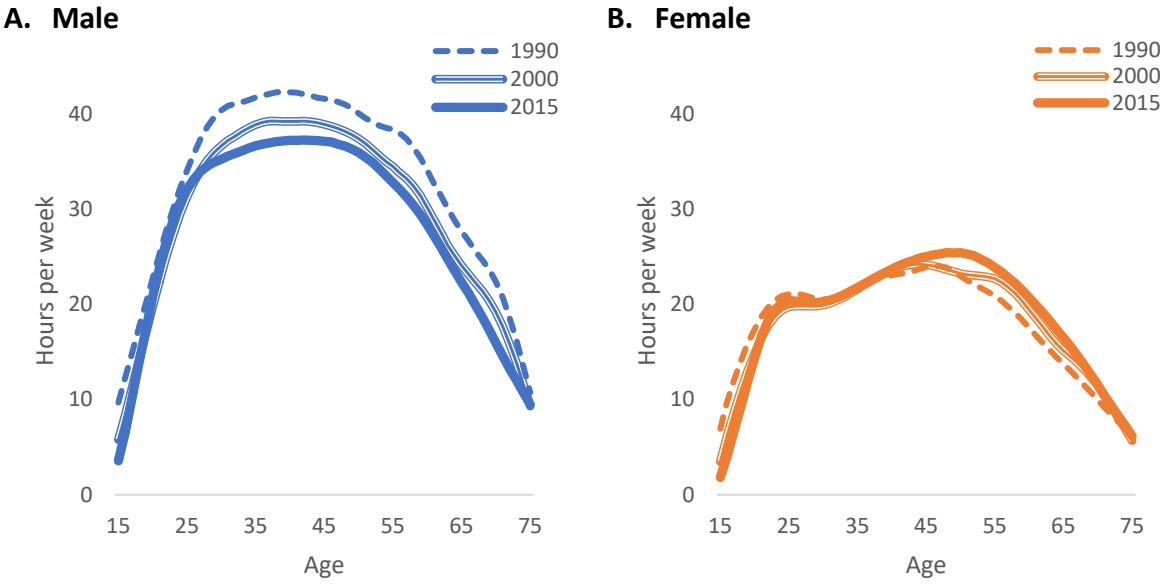
Figure 1 plots the average time spent per week on paid productive activities across different age groups by men and women between 1990 and 2015. Although there are some important differences across years, there are distinct features that persist. Among men and women, average hours worked starts low when young, increases and peaks at adulthood, and eventually tapers as individuals retire from the labor force. Women's average hours worked plateaus – or even slightly dips – between ages 20 to 30, coinciding with peak reproductive ages, before reaching its climax at around ages 45 to 55. Men's time on paid productive activities, on the other hand, do not exhibit a similar dip, and instead reaches its peak about ten years earlier at ages 35 to 45.

Notwithstanding these regularities, the time spent by men and women on paid market work has evolved over the last twenty-five years. For instance, the time spent by the young on paid work has decreased significantly for both boys and girls. In 1990, a 15-year old boy is expected to spend around ten hours per week on market-based activities. Girls of the same age, in contrast, spend seven hours per week on average on market work activities. These figures have been considerably reduced to four- and two-hours per week among boys and girls, respectively, in 2015. This trend overlaps with greater school participation among the young, including the rise in secondary level gross enrollment rate of 69.7% in 1990 to 88.5% in 2015.

Over the same period, the time spent by adult women on work outside the home has increased. The shift in women's time on paid work starts at around age 35, reaching its peak at around age 60 with three hours per week added in 2015 relative to 1990, before thinning down into retirement to the 1990 level. Men, on the other hand, have decreased their time on paid productive activities across all age groups in the last twenty-five years. At its peak, men spend an average of 42 hours per week on paid work in 1990. This has been reduced to only 37 hours per week by 2015.

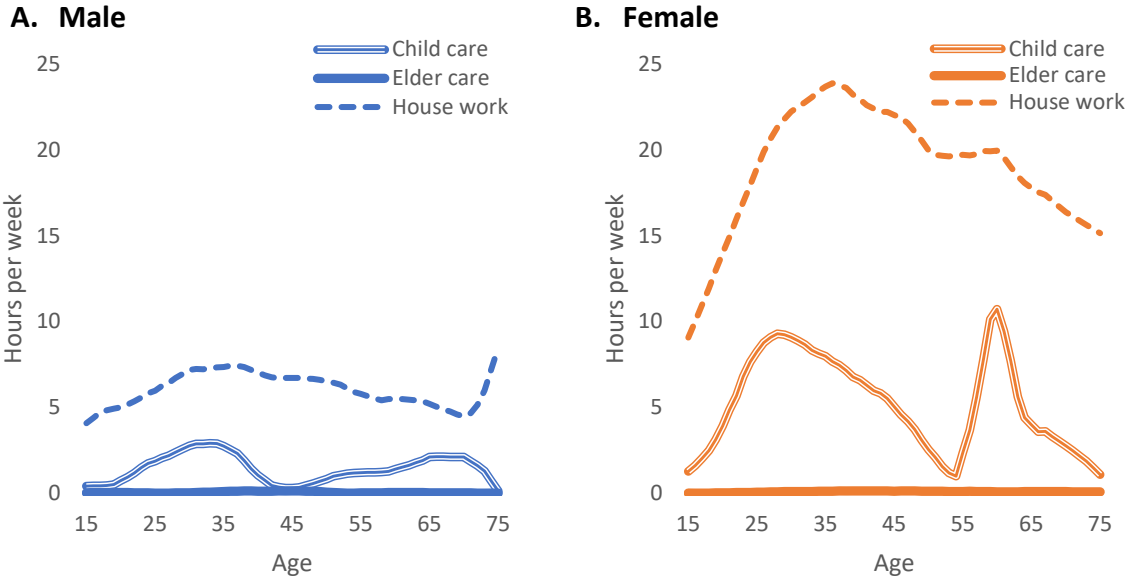
While instructive, the above picture of time allotted for work by men and women is incomplete. Time spent on unpaid home production may be as important, but are not as well documented.

Figure 1. Time spent on paid market work by age and sex: Philippines, 1990-2015



Note: Authors' calculations based on the October rounds of the 1990, 2000 and 2015 Labor Force Survey by the Philippine Statistics Authority (formerly the National Statistics Office).

Figure 2. Time spent on unpaid home production by age and sex: Philippines, 2000



Note: Authors' calculations based on the 2000 Philippine Pilot Time use Survey by the Philippine Statistics Authority (formerly the National Statistics Office).

In Figure 2, we plot the average time spent on unpaid home production activities in 2000 by men and women across different age groups. We categorize home production activities under three broad classes, namely, child care, elder care, and housework. The first two categories represent activities targeted towards specific age groups, while the last classification represent general activities that may benefit any member of a household. The figure is based on the 2000 Pilot Time-use Survey by the then National Statistics Office (now Philippine Statistics Authority [PSA]).

Comparing Figures 1 and 2 highlights clear delineation between men and women in terms of how much of their time are spent on market- and on home-production activities. While men spend a larger portion of their time on paid market work, women devote equal or more of their time on unpaid work at home. This apparent specialization among men and women between the market-versus-home production dichotomy persist across the lifecycle (cf. Houng, et. al., 2017; Vargha, et. al., 2017), and may be observed in other economies as well (cf. Antonopoulos and Hirway, 2010).

Much of unpaid home production is spent on housework. Women in their mid-30s spend on average one whole day of their week for housework alone. Contrast this with men who devote only as much as seven to eight hours per week for similar activities. This trend starts young. At age 15, for instance, girls spend nine hours of their time every week on housework, compared to boys' four hours.

Between caring for children and for the elderly, households spend more time on the young. Again, women spend more time on both child- and elder-care. As shown in the figure, the time allotted for childcare in the Philippines is double-humped, representing two generations of child-carers within households, i.e., the parents' and the grandparents' generations, for both men and women. This is not uncommon among multi-generation households, and may be seen as a coping strategy to allow parents to work-for-pay in order to provide economic support for the family (cf. Asis, 2006). This double-humped profile is observed elsewhere in Asia, such as in Vietnam (Huong et. al., 2017), but not in many European countries, where childcare provision is largely borne by the parents' generation only (Vargha, et. al., 2017).

Table 1. Average time spent per week on market and home production by sex and broad age group: Philippines, 2000

	Males				Females			
	15-19	20-39	40-59	60+	15-19	20-39	40-59	60+
Market Production	9.6	39.2	44.1	17.0	10.0	22.2	32.8	18.4
Home Production	2.0	8.6	7.3	7.3	4.9	28.0	25.6	21.6
Child care	0.2	2.0	0.8	1.5	0.7	7.6	4.5	4.2
Elder care	…	…	0.1	…	…	0.1	0.1	0.1
House work	1.7	6.5	6.4	5.8	4.2	20.3	21.1	17.2
Combined (Market + Home)	11.6	47.8	51.4	24.3	14.9	50.2	58.4	40.0

Note: Authors' calculations based on the 2000 Philippine Pilot Time use Survey, and the October 2000 Labor Force Survey by the Philippine Statistics Authority (formerly the National Statistics Office). Values are in hours per week.
… indicate less than 0.05 hours per week

When the time allotted for work in paid market and unpaid home production activities are combined (Table 1), it can be seen that women spend more hours working relative to men. Among those aged 15 to 19, for instance, young women devote around 30 percent more time working compared to young men of the same age. The gap in hours worked between men and women decreases around age 20 to 39, but starts to widen thereafter. Among the elderly aged 60 and older, women allocate around 40 hours a week for work, i.e., a week of full-time employment, which is in contrast to men's twenty-four hours.

Table 1 also highlights other important features that are worth noting. First, the young and the elderly are not only receivers of resources. Instead, they also contribute substantial resource to households in the form of time allotted for work either at home or in the market. Second, while women's working hours are largely spent on unpaid home production activities, their participation in paid market activities cannot be discounted. Between age 30 to 49, for example, women spend an average of 32.8 hours of their week on market production activities, while at the same time spending 25.6 hours on home production activities. Third, considering the sizeable time allotment for childcare, conventional estimates of child consumption, in general, and of human capital investments, in particular, may be direly under-valued.

3. Counting men and women's work

The Philippine Statistical System has adopted various mechanisms to regularly and systematically track and measure different gender and development indicators, including those related to (a) access to resources, (b) education, (c) health and related services, (d) public life and decision-making, and (e) human rights (PSA, 2016). However, while women spend more time working than men, its value, particularly of unpaid home production, is often not reflected in these official economic statistics. As a consequence, the value of women's work is frequently undervalued if not entirely invisible (cf. Collas-Monsod, 2010). Early attempts to incorporate gender into the Philippine System of National Accounts include Virola and de Perio (1998), and, later, Virola, et. al., (2007) by disaggregating the country's Gross Domestic Product (GDP) by sex while introducing the value of unpaid home production.

We build on these earlier attempts to value men and women's work in the country by providing sex-disaggregated estimates of National Transfer Accounts (NTA) and National Time Transfer Accounts (NTTA) for the Philippines. The NTA is a national accounting framework that is consistent with the United Nations (UN) System of National Accounts. It measures how different generations within an economy produce, use and share resources to satisfy each generation's material requirements (Mason, et. al., 2006; Lee and Mason, 2011; UN, 2013). NTA estimates are available for at least 160 economies by more than sixty NTA country research teams (Mason, et. al., 2017), including in the Philippines (cf. Racelis and Salas, 2011; Abrigo, et. al., 2016). The NTTA, on the other hand, is a complementary account that introduces time inputs that are not already incorporated in the national accounts-based NTA (Donehower, 2013).[2] [3]

[2] In the interest of space, we refer readers to UN (2013) and Donehower (2013) for an extensive description of the methodologies applied in the estimation of the Philippine NTA and NTTA.

[3] In addition to NTTA, several attempts have been made around the world to integrate the value of unpaid work into macroeconomic accounts, although an international consensus on specific methodologies are yet to be reached. The most common method is through a satellite account valuing unpaid home services based on imputed wages for time spent on home production activities. See Hirway (2015) for a review of valuation methodologies and related issues.

Unlike in Virola and de Perio (1998) and Virola, et. al. (2007) that use national sectoral sex-disaggregated employment or average working hours to allocate total sectoral gross value added, each national account income and outlay entry is disaggregated in NTA by assigning national account values to its actual user or producer based on nationally representative surveys and/or administrative records.[4] Further, Virola and de Perio (1998), and Virola, et. al. (2007) value unpaid home production using both opportunity cost and replacement cost of time.[5] In the NTTA, however, using replacement costs is the preferred methodology.[6] The replacement costs that we applied to home production activities are provided as Appendix A.

Figure 3 shows NTA (Panel A) and NTTA[7] (Panel B) estimates of the age profiles of per capita labor income and per capita consumption in the Philippines for 2015. The NTA and NTTA labor income age profiles follow similar patterns as the labor supply in time units (Figures 1 and 2). Aside from the actual time units expended for work, the figures also capture the many different factors that influence the market value of time, including household and individual endowments, pension and other support systems, prevailing market wages, etc. Estimates are disaggregated by sex. The age profiles of per capita consumption, which include both private and public consumption, are also plotted to provide a sense of the relative magnitude of labor income compared to consumption across the economic lifecycle.

Similar to observations based on time units, the average value of men's market work surpasses that of women at every age group, while women dominate over men in unpaid home production when these activities are valued at market wages. However, although the time spent by women on market and home production activities are more or less balanced (Table 1), particularly among prime-age adults, their per capita labor income imputed from unpaid home production, when valued at replacement wages, are barely half of those that are obtained from market activities. This highlights the wide discrepancy between the market value of the activities that comprise home production, which are largely performed by women, and the activities that constitute market production.

[4] The 2015 Philippine NTA age profile estimates of labor income and private consumption are calculated using the matched 2015 Family Income and Expenditure Survey and the January 2016 Labor Force Survey. The age profiles of public consumption, on the other hand, are based on utilization rates calculated from the 2014 Annual Poverty Indicators Survey, and the 2013 National Demographic and Health Survey.

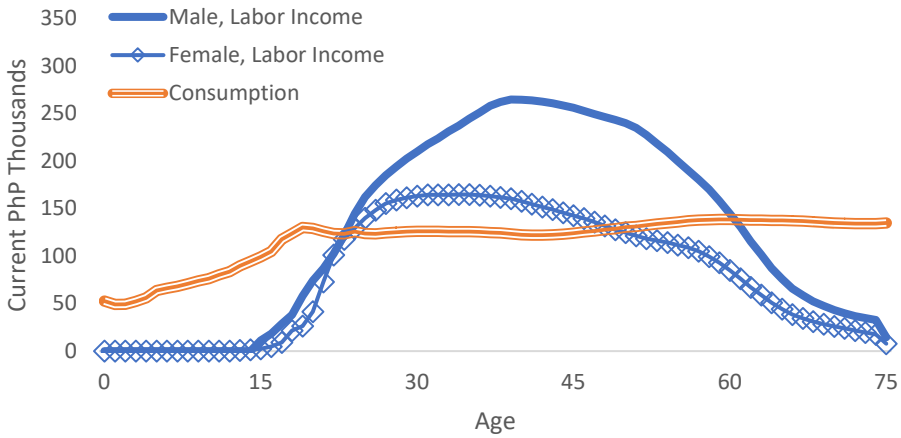
[5] In the opportunity cost method, the valuation of time depends on the characteristics of the person that performs the activity. Meanwhile, in the replacement cost method, the valuation depends on the cost a person has to pay for someone to perform the task. Each of these valuation philosophies have its particular strengths and issues. For instance, the opportunity cost method often provides higher estimates since it imputes skilled inputs to activities that needs it otherwise or that requires different skills. See Virola, et. al. (2008) and Sambt, et. al. (2016) for comparison of country estimates using different valuation methodologies. See Hirway (2015) for a discussion on alternative valuation methodologies and related issues.

[6] Because of limitations in the availability of more recent data, we use the age profiles of home production activities from the 2000 Pilot Philippine Time Use Survey, but valued using replacement wages calculated from the January 2016 Labor Force Survey.

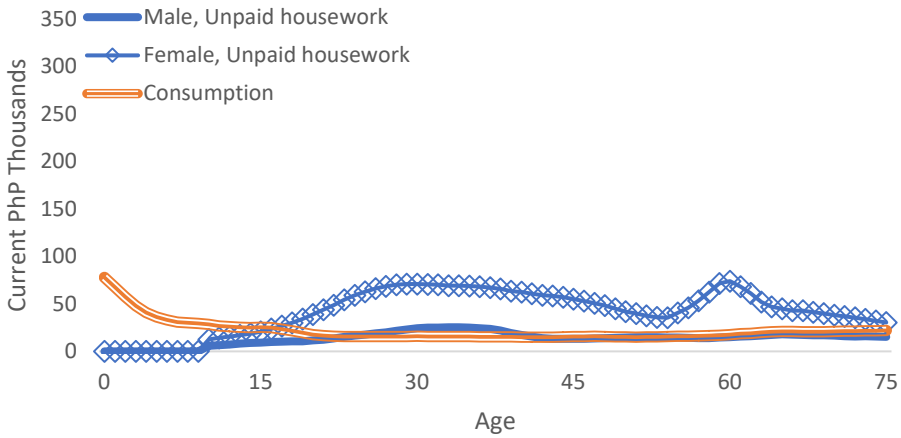
[7] The NTTA estimates are based on the age profiles of home production activities in time units from the Pilot 2000 Philippine TUS, and replacement wages calculated from the 2015 Labor Force Survey.

Figure 3. Per capita age profiles of production and consumption of market and nonmarket activities: Philippines, 2015

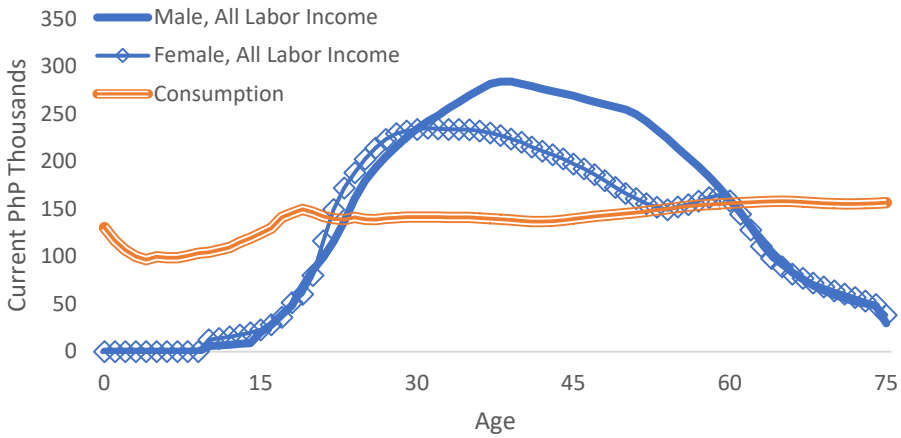
A. Market Activities



B. Nonmarket Activities



C. Combined Market and Nonmarket Activities



Note: Authors' estimates.

Relative to average consumption at each age, disaggregating the traditional NTA by sex shows that women consume more than what they earn from paid work for most of their lifetime. More specifically, the band of surplus ages, i.e., ages when labor income is greater than consumption, for women is very narrow, spanning only by twenty-five years with the surplus reaching only as much as a third of per capita consumption at its maximum. Men, on the other hand, experience lifecycle surpluses from age 24 until 60 that could reach as much as twice as their consumption.

However, Panel C shows that when the imputed value of unpaid home production is added to the traditional estimates, the band of surplus ages is about the same for men and women. Additionally, the contribution of women's work surpasses that of men in either ends of the economic lifecycle. These imply that using just the conventional NTA clearly underestimates the contribution of women's work.

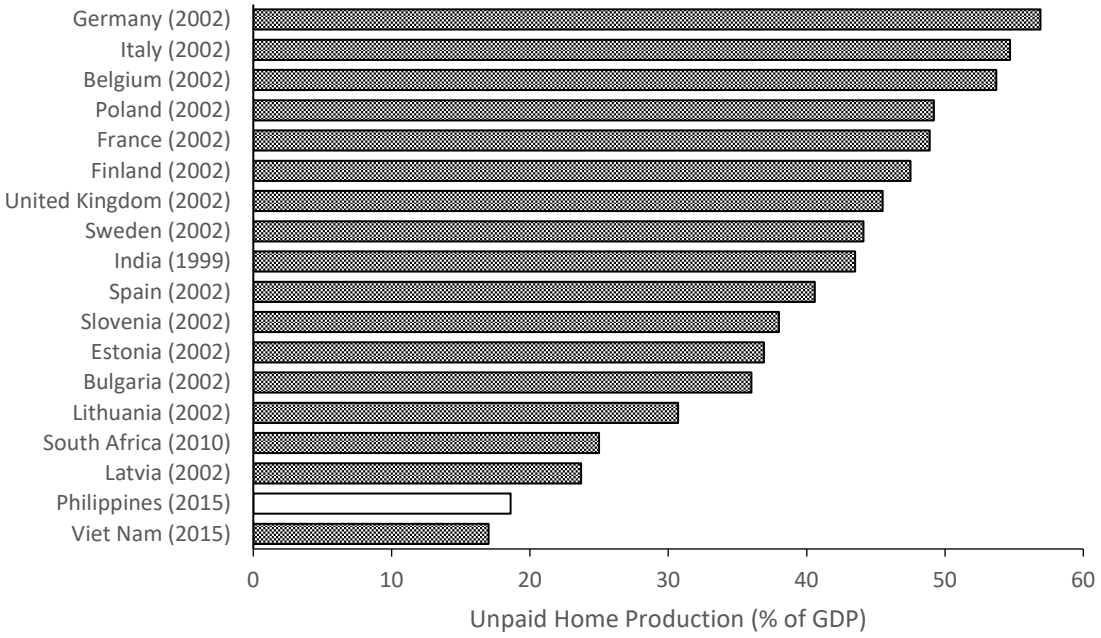
Overall, the value of unpaid home production activities in 2015 is estimated at PhP2.5 trillion (Table 2). About three-fourths of this is by women. Contrast this with the conventional national accounts-based estimate of aggregate labor income of PhP9.3 trillion, wherein men contribute more than sixty percent of the value. When combined together, the country's aggregate labor income from paid market- and unpaid home-production activities is estimated at PhP11.8 trillion, wherein forty-seven percent is contributed by women. Incorporating the value of unpaid home production shows that men and women are much closer to parity in their contribution to the economy than when using only the traditional valuation of work.

Table 2. Labor income by broad age group and sex: Philippines, 2015

	Males				Females			
	0-19	20-39	40-59	60+	0-19	20-39	40-59	60+
A. Per Capita (Thousand PhP)								
Market Production (NTA)	7.3	184.2	235.6	72.1	3.1	139.2	130.7	38.9
Home Production (NTTA)	4.2	19.9	14.4	16.3	10.2	62.4	51.1	45.3
Child care	0.9	8.0	3.0	5.8	2.9	29.8	17.5	16.6
Elder care	…	0.2	0.3	0.1	…	0.3	0.4	0.3
House work	3.3	11.7	11.0	10.4	7.3	32.3	33.2	28.4
Combined (NTA + NTTA)	11.5	204.1	250.0	88.4	13.3	201.6	181.8	84.2
B. Aggregate (Billion PhP)								
Market Production (NTA)	161.3	2,973.7	2,282.4	238.4	65.6	2,196.2	1,269.7	159.5
Home Production (NTTA)	92.2	321.8	139.1	53.9	212.8	983.7	496.3	185.8
Child care	19.3	129.7	29.2	19.3	60.9	469.3	169.7	68.3
Elder care	0.7	2.6	2.9	0.2	0.1	4.4	4.3	1.3
House work	72.2	189.5	107.0	34.4	151.8	510.0	322.3	116.3
Combined (NTA + NTTA)	253.6	3,295.5	2,421.5	292.2	278.4	3,180.0	1,766.0	345.2

Note: Authors' calculations.
… indicate less than PhP0.05 billion.

Figure 4. Imputed value of unpaid home production (% of GDP)



Note: Estimates for Vietnam, India and South Africa are from the Counting Women's Work Project (http://www.cww-dpru.uct.ac.za/), and are available from Nguyen, et. al. (2017), Ladusingh (2016), and Oosthuizen (2016), respectively. Estimates for European countries are from the AGENTA Project (http://www.agenta-project.eu/), and are available from Vargha, et. al. (2017). Estimates for the Philippines are by the authors. The value of unpaid home production presented above are all estimated using the NTTA methodology.

Adjusting the official 2015 Philippine GDP estimate by the imputed value of unpaid home production leads to an upward revision of 18.6 percent. This translates to an adjusted GDP of PhP15.8 trillion from only PhP13.3 trillion. This estimated rate is comparable to recent NTTA estimates of the value of unpaid work in Vietnam, Latvia and South Africa (Figure 4), but considerably modest relative to the earlier estimates for the Philippines using a different methodology by Virola and de Perio (1998) and Virola, et. al. (2007).[8] It is quite interesting to note though, that the values of unpaid home production presented in Figure 4 are rather dated even in many industrialized countries.

4. Beyond monetary valuation

The estimates in the previous section provide a valuation of the direct contribution of men and women's work in the economy. While it improves upon using just market-based work to value men and women's time, the picture it paints may very well still be incomplete as many other important factors may be at play which we have not taken into account. We outline several of these potential factors below.

[8] Virola and de Perio (1998) estimated the value of unpaid home production in the Philippines to be at 36.5 to 37.3 percent of GDP between 1990 and 1997 depending on the wage rate used. Updated estimates by Virola, et. al. (2007) for 2000-2006 using the same methodology place the value of unpaid home production at 37.0 percent of GDP, and with a different methodology at 66.2 percent.

First, we imputed the value of unpaid home production using prevailing replacement wages. However, it may be possible that the time of those who stay at home to perform non-market productive activities are more valuable than the replacement wages that we employ, i.e., the opportunity cost of time for performing unpaid housework may be much higher. For instance, Sambt, et. al. (2016) showed that using opportunity cost wages leads to about 23 percent higher valuation of unpaid home production than when using replacement wages in Slovenia. The difference in Virola and de Perio's (1998) earlier estimates for the Philippines are much lower at two to three percent.

Second, we have not considered potential differences in the work quality between an unpaid household member-producer and a paid market worker to perform home production activities. The presence of such quality differences implies variations in output per unit cost, which ultimately affects the valuation of unpaid home production.

Finally, the value of some activities that constitute unpaid work may not be fully realized at the time of the activity, but only later into the future. That is, some home production activities may actually be treated as investments that may reap returns in the future in addition to having consumption value for the present. This suggests that our estimate of the value of men and women's work, especially of unpaid home production, are actually downward biased.

We bridge this limitation in our earlier estimates by looking at how parental labor force participation directly influence child schooling outcomes. As shown in previous studies, the time allocation of parents, especially of mothers, has important implications on various child outcomes, including children's cognitive development (e.g., Bernal, 2008; Ruhm, 2008), and health (e.g., Miller and Urdinola, 2010; Popkin, 1980). However, the evidences from the literature are mixed, and very well depend on the timing of job-holding relative to a child's age (Ruhm, 2008).

We assess this issue by looking at two schooling indicators, namely, school attendance propensity, and standardized age-for-grade score. Both these measures provide us indications of the quality of children, which we take as proxies for the quality of a household as well. The first indicator, school attendance, directly measures child school participation. It takes on a value of one if the child is attending school, and zero if otherwise. The second indicator, standardized age-for-grade score, on the other hand, gauges, although indirectly, the quality of schooling by measuring how quickly a child is able to transition to higher education grade levels relative to his (her) peers. The standardized age-for-grade score a_i^z is calculated as

$$a_i^z = \frac{(a_{il} - \bar{a}_l)}{sd(a_l)}$$

where a_{il} is the age of a child indexed by i, and $\bar{a}_l$ and $sd(a_l)$ are the national mean and standard deviation of children's age enrolled in grade level l. A higher (lower) age-for-grade score indicates that a child is older (younger) relative to other students of the same grade level. For instance, a value of two indicates that a child is twice a standard deviation older than the average child enrolled in the same grade level. Similarly, a value of minus one indicates that a child is one standard deviation younger than the average child in the same grade level.

In this analysis, we use data from the matched 2015 Family Income and Expenditure Survey (FIES), and the January 2016 Labor Force Survey (LFS) by PSA. The triennial FIES provides detailed information on household incomes and expenditures, and is a rider to the quarterly

LFS, which is designed to capture individual-level labor force outcomes. We restrict our sample to children aged 5 to 14 living with both parents in nuclear households. In addition, we only include children with mothers aged 25 to 49 at the time of the survey. This leaves us with 10,823 children-sample from 5,468 households. These restrictions ensure that the children in our sample are exposed to more or less homogeneous household settings, as well as limit the potential influence of unobserved confounding from having very young or elderly parents, especially on parental labor force participation.

We use two measures of parental labor force participation. First, we use an indicator variable that takes on a value of one for the mother or father if that parent is *not* in the labor force. Second, we also use each parent's hours worked in the past week, which captures the intensity of participation by each parent in the labor market. We control for potential confounders in our econometric models by including household income, family size, and parents' educational attainment in the specifications. These variables have been previously documented to significantly influence child schooling outcomes while, at the same time, may be correlated with our measures of parental labor force participation, thereby potentially biasing our results. Summary statistics of these key indicators are presented as Appendix B.

Although we have limited our sample and controlled for important characteristics, there could still be other unobserved confounders that may be correlated with both parental labor force participation and child schooling outcomes which could introduce bias into our estimates. For instance, a mother's decision to re-enter the labor force may depend on her assessment of how well her children can cope with both parents working outside the home, as well as the availability of other adults to care for her children while she is away for work. These characteristics, however, may also influence children's schooling success, thus potentially confounding our results.

We attempt to correct for this potential endogeneity bias by instrumenting mother's labor force participation with the age of her youngest child. The age distribution of children has been shown in previous studies to be directly associated with mothers' decision to participate in the labor market (Heckman, 1977; Killingsworth and Heckman, 1986). More specifically, having very young children may dissuade mothers from participating in paid market work because of the low substitutability of mother's care, which eases as children mature (Mincer, 1962). We only instrument for mothers' labor market decisions since the issue of selection into working outside the home are of limited importance among fathers. In our sample, 97 percent of fathers reported to be in the labor force, compared with only 61 percent among mothers.

Tables 3 and 4 present estimates on the association between parental labor force participation and hours worked, and child schooling outcomes. Columns (1) to (3) in each table show estimates for child school attendance, while columns (4) to (6) for age-for-grade *z*-score. As may be expected, the estimates show that household income, family size, and parental education are significantly associated with the schooling outcomes of children. More specifically, higher per capita household income, as well as having better educated parents, are positively (negatively) associated with school attendance (age-for-grade *z*-score). The results also suggest that having more siblings is associated with better schooling outcomes, at least for our specific study sample.

Table 3. Parental labor force participation and child schooling outcomes

	School attendance			Age-for-grade z-score		
	(1)	(2)	(3)	(4)	(5)	(6)
Mother is not in the labor force	0.208	0.440**	0.422**	-3.160***	-4.953***	-4.865***
	[0.129]	[0.203]	[0.202]	[0.946]	[1.548]	[1.568]
Father is not in the labor force	0.006	0.035	0.034	-0.470**	-0.667**	-0.650**
	[0.029]	[0.039]	[0.038]	[0.210]	[0.318]	[0.315]
Per capita income, log		0.089***	0.079**		-0.807***	-0.778***
		[0.030]	[0.032]		[0.234]	[0.254]
Family size, log		0.082*	0.082*		-0.663**	-0.656*
		[0.043]	[0.042]		[0.334]	[0.335]
Mother's education – Elementary			0.094**			-0.361
			[0.046]			[0.290]
Mother's education – Secondary			0.111**			-0.460
			[0.046]			[0.295]
Mother's education – Tertiary			0.121**			-0.613*
			[0.049]			[0.319]
Father's education – Elementary			0.074*			0.281
			[0.038]			[0.285]
Father's education – Secondary			0.070*			0.356
			[0.041]			[0.318]
Father's education – Tertiary			0.062			0.470
			[0.045]			[0.353]
Constant	0.331***	-0.859*	-0.936*	0.765**	11.13***	10.92***
	[0.080]	[0.484]	[0.498]	[0.386]	[3.562]	[3.659]
Kleibergen-Paap LM statistic, χ^2	9.056	7.484	7.109	12.695	10.823	10.193
Kleibergen-Paap rk Wald statistic, F	9.037	7.453	7.078	12.661	10.754	10.127

Note: Authors' calculations. Mother's hours worked are instrumented by the age of youngest child living in the household. Kliebergen-Paap LM and rk Wald statistics respectively test for under- and weak-identification in the IV/2SLS model. ***, **, and * indicate statistical significance at the 1-, 5- and 10-% alpha-levels, respectively.

Table 4. Parental hours worked and child schooling outcomes

	School attendance			Age-for-grade z-score		
	(1)	(2)	(3)	(4)	(5)	(6)
Mother's hours worked	-0.003	-0.008**	-0.008**	0.054***	0.112***	0.109**
	[0.002]	[0.004]	[0.004]	[0.015]	[0.043]	[0.043]
Father's hours worked	0.000	0.000	0.000	-0.001	-0.002	-0.001
	[<0.001]	[<0.001]	[<0.001]	[0.001]	[0.003]	[0.003]
Per capita income, log		0.111**	0.097**		-1.255***	-1.183**
		[0.044]	[0.044]		[0.465]	[0.473]
Family size, log		0.085*	0.083*		-0.905*	-0.880*
		[0.046]	[0.045]		[0.493]	[0.488]
Mother's education – Elementary			0.073*			0.004
			[0.044]			[0.324]
Mother's education – Secondary			0.090**			-0.110
			[0.044]			[0.329]
Mother's education – Tertiary			0.096**			-0.196
			[0.045]			[0.340]
Father's education – Elementary			0.093***			-0.075
			[0.032]			[0.246]
Father's education – Secondary			0.101***			-0.112
			[0.032]			[0.258]
Father's education – Tertiary			0.093***			-0.021
			[0.035]			[0.290]
Constant	0.495***	-0.727	-0.777*	-1.622***	11.985**	11.469**
	[0.047]	[0.470]	[0.468]	[0.356]	[4.796]	[4.776]
Kleibergen-Paap LM statistic, χ^2	14.220	6.248	6.046	14.509	6.988	6.723
Kleibergen-Paap rk Wald statistic, F	14.197	6.225	6.021	14.474	6.949	6.684

Note: Authors' calculations. Mother's hours worked are instrumented by the age of youngest child living in the household. Kliebergen-Paap LM and rk Wald statistics respectively test for under- and weak-identification in the IV/2SLS model. ***, **, and * indicate statistical significance at the 1-, 5- and 10-% alpha-levels, respectively.

Overall, our estimates suggest that greater labor force participation among parents, specifically of mothers, has important implications on the quality of children. Table 3 shows that children with mothers *not* in the labor force are more likely to be attending school by 42.2 percentage points relative to other children (Column 3). In addition, these children are also able to transition to higher grade levels faster than their peers (Columns 4 to 6). Fathers' labor force participation, on the other hand, appears more important in explaining schooling quality relative to school attendance of children. In both child schooling indicators, the estimated association relative to mothers' labor force non-participation are significantly higher compared to those of fathers.

Looking at the intensity of labor force participation by parents (Table 4), children of working moms are more likely to not attend school as mothers spend more time at work. Every additional hour of work by mothers is associated with a 0.8 percentage point rise in the probability that a child is not attending school. Moreover, our estimates also suggest that as mothers spend more time working their children lag further behind in school. In comparison, fathers' time at market work appear to be of limited importance to children's schooling outcomes. These associations are robust even after controlling for household income and parents' educational attainment.

It is important to note that we have purposely limited our analysis to single-family households to ensure that the children in our study sample are more or less exposed to similar household settings. In our limited sample however, childcare can only be provided by parents or by more mature children, if any. Hence parents' decision to participate in the labor force directly impacts the amount of time available for child-rearing. Circumstances may be different in multi-generation households, wherein other members of the extended family, such as grandparents, can substitute for parents' time for childcare.

Nevertheless, the above results underscore the contribution of men and women's participation in market and non-market work on the quality of children, which may not be readily monetized. On the one hand, working outside the home for pay eases household budget constraints that may allow parents to invest more intensively on the quality of their children. On the other hand, the quality of children very much depends also on time inputs of parents. A possible compromise in order to satisfy both requirements may be some form of specialization between men and women's participation in paid market production and in unpaid home production, which we observe in many households.

5. Conclusion

Men and women play important roles in the economy. However, the contribution of men and women are often not accounted similarly. This study highlights some of these unaccounted contribution by providing new estimates of the value of men and women's work. The Philippine NTA and NTTA estimates show that while men work and earn more from paid market activities, women contribute more work at home. The value of unpaid home production constitutes roughly a fifth of the country's GDP. When this fact is taken into account, the contribution of men and women's work in the economy are found to be more equal than when only considering the value of paid market work.

That said, the value of men and women's work may go beyond the monetary, and the direct valuation of their contributions to the economy may not be fully possible. We have shown that both market and home production activities are important in nurturing children's human capital, although the gains from such investments may be felt only in the future. While paid work eases household budget constraints that allows greater investments on children, time inputs may also be necessary in their development. This may have important implications on designing policies to promote female participation in the labor force. Indeed, it may actually be counter-productive to raise female participation in market work under certain circumstances in light of the important role women play in home production and the quality of children.

Efforts to raise labor force participation among women need to recognize the value of women's work be it at home or in the market. Women may be unwilling to (re-)enter the labor market because the potential loss to the household – in terms of foregone household services or even lower child investments – may be greater than their gains from her paid employment.[9] In this regard, developing policies to allow greater participation of *both* men and women in home production may be crucial to fill-in the potential void that having more women work for pay outside the home may pose. For instance, this may be in the form of longer paid parental time off from work available *equally* to male and female parents. Or it may also be in the form of more flexible working hours. Promoting more equal participation of men and women in home production activities may even start early, such as through mass media and in schools, by challenging traditional gendered roles at home and work. These and other creative solutions already exist, and may only need to be expanded.

It cannot be overemphasized that our estimates barely scratched the surface of valuing men and women's contribution to the economy. Indeed, we only looked at the value of men and women's work. However, compensation from labor only accounts for about two-thirds of the country's GDP. The other third is due to capital, which we have not considered in the analysis. This may be an important emerging concern especially among aging populations. As populations age and the economy's share of workers declines, returns from capital investments may become a more significant source of household income. Shedding light on the distribution of, opportunities for, and access to asset holdings between men and women may be an important first step to understanding future household dynamics.

But understanding the dynamics between men and women require careful appreciation of evidences. And evidences necessarily require data. This study demonstrates the importance of both men and women's work in the economy using established NTA and NTTA methodologies. However, the time use survey we employed to estimate the value of unpaid home production is only a pilot survey, and may not be fully representative of the whole population. Further, the time use survey is almost two decades old. Household dynamics surrounding market work and home production may have already changed considerably. Regular collection of time-use information, such as through stand-alone time-use surveys or as rider questions in other household-based surveys, is important in demystifying issues and advocating policies surrounding the care economy. As we have shown, the technology to make invisible work visible is available. Having relevant and timely data on men and women to support empirical work is another part of the equation.

[9] This of course does not preclude gender issues in the workplace which we did not touch in this research.

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Appendix

Appendix A. Time use activities and imputed wage rate: Philippines, 2015

Time use activity	Occupational Classification	Average Hourly Basic Wage (PhP)
Cleaning; Laundry (including sewing and clothing repair); Cooking (food and drink preparation); Lawn and garden care; and Purchasing of goods and services	Domestic helpers, cleaners, launderers and related workers Housekeeping and restaurant services workers	29.6
Household maintenance and repair	Trades and related workers	42.2
Household management (including finance, scheduling, coordinating, and related telephone calls)	Officials of government and special-interest organizations, corporate executives, managers, managing proprietors and supervisors Business Professionals Finance and Sales Associate Professionals Administrative Associate Professionals	110.8
Child care; Elder care and care outside the home (including volunteering); and Pet care (not veterinary care)	Personal care and related workers Social work associate professionals	75.2
Travel (related to care activities and purchasing goods and services)	Motor vehicle drivers	45.8

Note: Hourly wage rates are calculated from the pooled 2015 Quarterly Labor Force Surveys by the Philippine Statistics Authority.

Appendix B. Summary statistics

	All Households		Maternal Labor Force Participation				Paternal Labor Force Participation			
			Not in Labor Force		In Labor Force		Not in Labor Force		In Labor Force	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Child characteristics										
Attending school (= 1)	0.957	0.204	0.940	0.238	0.950	0.218	0.946	0.226	0.950	0.217
Age-for-grade z-score	0.016	0.704	0.014	0.645	0.004	0.682	0.027	0.626	0.010	0.685
Age	9.998	2.773	9.660	2.836	9.864	2.803	9.979	2.669	9.858	2.799
Male (= 1)	0.513	0.500	0.503	0.500	0.509	0.500	0.492	0.501	0.510	0.500
Household characteristics										
Per capita income ('000)	45.207	47.749	34.091	27.544	40.803	41.312	47.011	38.715	39.408	38.827
Family size	5.343	1.486	5.343	1.538	5.343	1.507	4.974	1.433	5.354	1.508
Mother's highest grade completed										
Elementary (= 1)	0.261	0.439	0.297	0.457	0.275	0.447	0.207	0.406	0.278	0.448
Secondary (= 1)	0.463	0.499	0.491	0.500	0.474	0.499	0.360	0.481	0.481	0.500
Tertiary (= 1)	0.262	0.440	0.189	0.391	0.233	0.423	0.417	0.494	0.223	0.416
Father's highest grade completed										
Elementary (= 1)	0.352	0.477	0.364	0.481	0.356	0.479	0.256	0.437	0.365	0.481
Secondary (= 1)	0.414	0.493	0.425	0.494	0.419	0.493	0.413	0.493	0.425	0.494
Tertiary (= 1)	0.212	0.409	0.176	0.381	0.198	0.398	0.310	0.463	0.183	0.387
Mother's hours worked (past week)	38.491	22.370	-	-	23.786	25.672	39.571	25.050	22.457	25.454
Father's hours worked (past week)	40.400	19.104	44.713	15.614	42.047	17.973	-	-	43.403	16.541

Note: Authors' calculations based on the matched 2015 Family Income and Expenditure Survey and the January 2016 Labor Force Survey by the Philippine Statistics Authority.